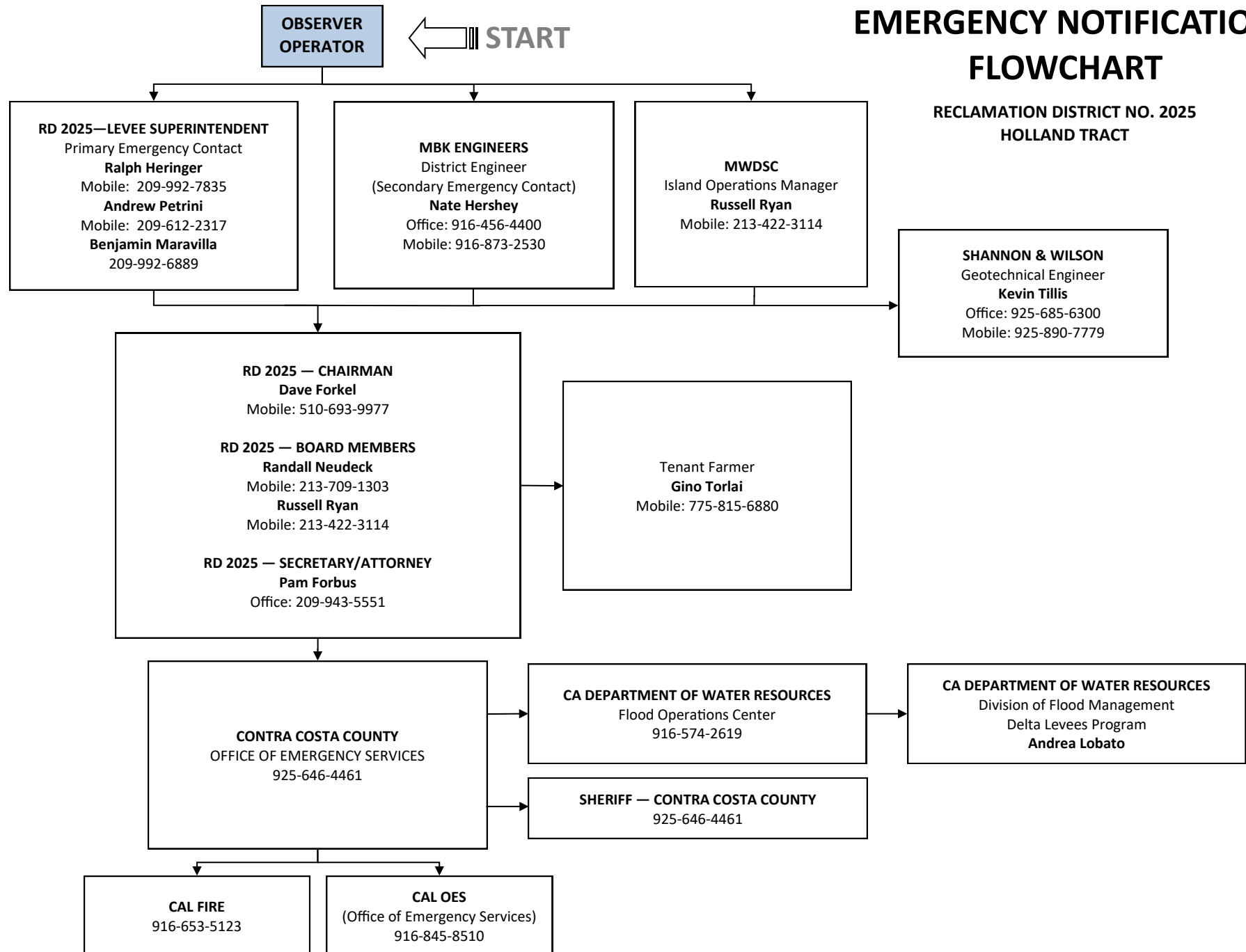


EMERGENCY NOTIFICATION FLOWCHART

RECLAMATION DISTRICT NO. 2025
HOLLAND TRACT





LEGEND

- FLOOD SUPPLY CONTAINER
- RIP RAP STOCKPILE

MBK
ENGINEERS

455 University Avenue, Suite 100
Sacramento, California 95825
Phone: (916) 456-4400 • Fax: (916) 456-0253

RECLAMATION DISTRICT NO. 2025
HOLLAND TRACT

**FLOOD FIGHT SUPPLIES AND
EMERGENCY STOCKPILE MAP**

| | |
|-------------|-------------|
| SCALE: | 1" = 3,000' |
| JOB NUMBER: | 4275.6 |
| DRAWN BY: | MN |
| DATE: | 12/13/2019 |
| SHEET: | 1 OF 1 |



Contra Costa County

LOCAL FLOOD SAFETY PLAN

HOLLAND TRACT

RD 2025

PREPARED BY

Michael Baker
INTERNATIONAL



Final

May 2018



INTENTIONAL BLANK PAGE



Plan Promulgation

HOLLAND TRACT LOCAL FLOOD SAFETY PLAN PROMULGATION

It is crucial for Holland Tract to have complete and up-to-date plans to guide critical actions during a flood emergency event. Since 2007, the California Water Code (WC 9650) has specified several required elements for a Local Flood Safety Plan (LFSP). Thus, agencies and communities within Contra Costa County must adopt an LFSP with specific elements to be eligible for funds to upgrade their flood control facilities.

The Holland Tract LFSP is consistent with current policy guidance and describes interrelationships with other agencies. The LFSP will continue to evolve in response to lessons learned from actual disasters and emergency experiences, ongoing planning efforts, training and exercise activities, and State Department of Water Resources (DWR) guidance.

Therefore, in recognition of the flood-fighting responsibilities of Holland Tract and with the authority vested in me, I hereby promulgate the Holland Tract LFSP.

This LFSP will be distributed to appropriate officials and will be reviewed and updated on an annual basis, or earlier, based on lessons learned from exercises and real-world events.

DISCLAIMER

This Emergency Operations Plan ("Plan") is intended to be a set of guidelines to be followed in the event of a flood emergency. Emergency conditions may vary significantly and may require that different elements of the Plan be utilized, depending upon the nature and extent of the particular emergency event, despite language in the Plan that appears to mandate certain actions. Notwithstanding anything to the contrary set forth in the Plan, including any language that appears to require particular action(s), the District preserves the ability to undertake all or any portion of the Plan as necessary and appropriate to respond to the particular emergency and preserve life and property. Under no circumstances will the District Board or its officers or employees be personally responsible for the procedures undertaken or not undertaken by Reclamation District No. 2025 in the event of a flood emergency, regardless of whether or not such procedures were included in the Plan.

Sign Here _____



INTENTIONAL BLANK PAGE



Record of Changes

| Date | Section | Description |
|----------|---------|-----------------------|
| May 2018 | 2.5 | Added Evacuation Plan |
| May 2018 | 6.6 | Added Evacuation Plan |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |



INTENTIONAL BLANK PAGE



Table of Contents

| | |
|---|-----------|
| SECTION 1. Plan Introduction | 1 |
| 1.1 Purpose | 1 |
| 1.2 Scope | 1 |
| 1.3 Plan Structure | 2 |
| SECTION 2. Concept of Operations | 3 |
| 2.1 Situation Overview | 3 |
| 2.2 General Approach to Seasonal Flood Operations | 6 |
| 2.2.1 Routine Preparedness and Infrastructure Maintenance | 6 |
| 2.2.2 Monitoring and Analysis | 6 |
| 2.2.3 Alerting, Activation, and Initial Response | 9 |
| 2.3 Flood Fight Operations | 10 |
| 2.3.1 General Flood Fight Strategy for High Water Events | 10 |
| 2.3.2 Flood Contingency Options | 11 |
| 2.3.2.1 General Flood Fight Options | 11 |
| 2.3.2.2 Local Flood Contingency Planning Scenarios | 16 |
| 2.4 Federal and State Disaster Assistance | 18 |
| 2.5 Evacuation Plan | 18 |
| SECTION 3. Organization and Assignment of Responsibilities | 19 |
| 3.1 Organization | 19 |
| 3.2 Assignment of Responsibilities | 19 |
| 3.2.1 Legal and Financial Commitments | 20 |
| 3.2.2 Emergency Equipment, Supplies, and Resources Maintenance | 20 |
| 3.2.3 Water Conditions, Elevations, and Forecast Monitoring | 20 |
| 3.2.4 Staff and Activation during Emergency Operations | 21 |
| 3.2.5 Expenditures, Emergency Actions, and Mutual Aid Documentation | 21 |
| SECTION 4. Direction, Control, and Coordination | 23 |
| 4.1 Management and Control of Operations and Coordination | 23 |
| 4.1.1 Management and Policy | 23 |
| 4.1.2 Incident Command Facilities | 23 |
| 4.2 Management and Coordination with Other Jurisdictions | 23 |
| 4.2.1 Unified Flood Fight Command Post | 23 |



| | |
|---|-----------|
| 4.2.2 Operational Area Emergency Operations Center | 24 |
| 4.2.3 State-Federal Flood Operations Center | 25 |
| 4.2.4 Operational Area Joint Information Center | 25 |
| SECTION 5. Communication | 27 |
| 5.1 Communication Organization | 27 |
| 5.2 Communication within Holland Tract | 27 |
| 5.3 Communication with Other Jurisdictions | 27 |
| 5.3.1 Operational Area Emergency Operation Center | 27 |
| 5.3.2 Department of Water Resources State-Federal Flood Operations Center | 28 |
| SECTION 6. Logistics and Finance/Administration..... | 29 |
| 6.1 Mutual Aid | 29 |
| 6.2 Resources | 29 |
| 6.3 Logistics Facilities..... | 30 |
| 6.4 Finance and Administration..... | 30 |
| 6.5 New Building Requirements | 31 |
| SECTION 7. Plan Review and Maintenance | 32 |
| 7.1 Plan Review and Maintenance | 32 |
| 7.2 Training and Exercises | 32 |
| 7.2.1 Emergency Response and Training | 32 |
| 7.2.1.1 Emergency Response | 32 |
| 7.2.1.2 Training Requirements..... | 32 |
| 7.3 Plan Evaluation | 32 |
| SECTION 8. Authorities and References..... | 34 |
| 8.1 Federal | 34 |
| 8.2 State..... | 34 |
| 8.3 Local..... | 34 |
| SECTION 9. Glossary of Terms/Acronyms | 36 |
| Appendix A. Flood Contingency Map | 38 |
| Appendix B. Increased Readiness Checklist | 40 |
| Appendix C. Flood Water Removal (Dewatering) Options..... | 42 |
| Appendix D. Action and Event Progression Log..... | 44 |



Appendix E. Emergency Personnel Contacts 46

List of Tables

Table 1: Special Flood Considerations 5

Table 2: Flood Contingency Options 17

Table 3: Contact Information 28

Table 4: Flood Fight Supply Inventory 29

List of Figures

Figure 1: Holland Tract Regional Location 4

Figure 2: Stream Gauge Locations 7

Figure 3: River Gauge Links 8

Figure 4: Levee Sack Topping Diagram 12

Figure 5: Muscle Wall 13

Figure 6: Levee Boil Diagram 14

Figure 7: Boil on Levee 14

Figure 8: Envelope Wind Wave Protection Method 16

Figure 9: LMA Boundaries and Incident Command Post (ICP) Locations 24

Figure 10: Regional EOC & ICP Map 25

Figure 11: Pre-positioned Flood Fight Materials, Supplies, and Headquarters 30



INTENTIONAL BLANK PAGE



SECTION 1. PLAN INTRODUCTION

1.1 Purpose

The purpose of this Local Flood Safety Plan (LFSP) is to ensure that response objectives in a flood emergency can be met within and around the impacted levee area in order to reduce injuries and the loss of human life and to minimize property damage. This plan is intended to be used in conjunction with the Emergency Operations Plan of Contra Costa County and to facilitate multi-jurisdictional coordination within the Reclamation District boundary.

This plan is a response support mechanism for levee maintaining agencies in the event of levee failure. Levee failure is the collapse or failure of an impoundment that causes significant downstream / island flooding. Levee failure primarily occurs due to overtopping or “piping” (internal erosion of soil particles resulting in a pathway for water flow). Failure from overtopping would occur if water spilled over the face of the dam, causing erosion of the downstream face which could lead to complete failure. This is most common during heavy rainstorms. Piping failure could occur at any elevation and could be related to seepage, internal erosion near conduits, or backward erosion piping from the downstream face. Seismic activity may also cause inundation by the action of a seismically-induced wave that overtops the dam without causing failure of the dam, but still floods downstream. Landslides flowing into a lake may also cause a dam to fail or overflow. The principle consequences of levee failure are injury, loss of life, and significant downstream property damage. Inundation, or flooding which occurs as a result of embankment or spillway structural failure of a levee, poses a serious threat to specific areas within Contra Costa County and surrounding areas.

1.2 Scope

This levee maintaining agency (e.g., Reclamation District or other special district), as an independent jurisdiction, has the responsibility for maintaining the levee and drainage systems within its jurisdictional boundaries. While Holland Tract will work with, and assist if possible, the local jurisdiction(s) responsible for other public safety functions within Holland Tract, this plan only contains detailed procedures for its emergency responsibilities. The manner of interacting with other jurisdictions is described, but the operational plans of other jurisdictions with public safety responsibilities within the area protected by Holland Tract levees are only referenced in this document.

THIS PLAN COVERS THE FOLLOWING:

- Holland Tract Flood Preparedness Procedures
- Holland Tract Levee Patrol Procedures
- Holland Tract Flood Fight Procedures
- Holland Tract Flood Water Removal Procedures
- Holland Tract Recovery and After-Action Follow-up Procedures



1.3 Plan Structure

This plan is structured as a traditional functional Emergency Operations Plan in accordance with Comprehensive Preparedness Guide (CPG) 101, issued by the Federal Emergency Management Agency (FEMA). Consistent with that guidance, and the levee maintaining agency's limited responsibilities and lack of internal departments, this LFSP consists of a Basic Plan, containing an overview of Holland Tract response procedures, and a hazard-specific annex in map format (Annex A – Flood Contingency Map).



SECTION 2. CONCEPT OF OPERATIONS

2.1 Situation Overview

The Delta is affected by riverine flows from the Sacramento, San Joaquin, Cosumnes and Mokelumne rivers along with tidal conditions from the San Francisco Bay. Fed by runoff from the northern Sierra Nevada Mountains and the southern Cascades, the Sacramento River flows south to meet the northbound San Joaquin River just south of the City of Sacramento. Smaller tributaries and tidal flows combine with the Sacramento and San Joaquin Rivers to form a 700-mile maze of sloughs and waterways surrounding more than 60 leveed tracts of land or “islands.” The state and local protective facilities throughout the Delta region, such as dams, bypasses, and project levees¹, afford a level of flood protection; however, the flood events of 1986, 1995, 1997, 1998, and 2007 demonstrated that there is still a significant flood threat in the Delta region.

In all, there are more than 1,100 miles of levees in the Delta like those surrounding Dutch Slough, including many built more than a century ago to protect farmland. Approximately two-thirds of the Delta reclaimed lands are below sea level, and land owners rely on a maze of levees to protect valuable rural and urban land and key infrastructure from floods and daily high tides. The network of watercourses in the region are characterized predominantly by natural vegetation and limited channel capacity controlled by levees to protect the islands from inundation by floodwater.

Located on Old River in the central delta Holland Tract is vulnerable to several flooding sources caused predominantly by tidal, riverine action and wave run-up. Major waterways adjacent to Holland Tract include Sand Mound Slough, Rock Slough, Holland Cut, portions of Old River, and the water body of Franks Tract. **(See Figure 1 and Appendix A.)** Extreme high-water conditions within these waters are caused by a combination of coincident high tides and high river flows which can be extremely threatening to levee integrity. High river flows result when upstream reservoirs are full, and reservoir operators are forced to release water in high volumes downstream eventually affecting Delta water levels. Even with an average snowpack, major Pacific storm events can be a threat to low-lying areas of the Delta especially during king tides². When a Pineapple Express (a meteorological phenomenon characterized by a strong and persistent flow of atmospheric moisture and associated with heavy precipitation from the waters adjacent to the Hawaiian Islands and extending to any location along the Pacific coast of North America) occurs, Holland Tract is vulnerable to flooding from a number of sources, including excessive runoff in the mountain regions and related reservoir releases. Even with an average snowpack, major Pacific storm events can be a threat to low-lying areas of the Delta, especially during King Tides³. When a “Pineapple Express” (a meteorological phenomenon characterized by a strong and persistent flow of atmospheric moisture⁴) occurs, its rain events can melt snowpack in the mountain regions, and reservoir operators are forced to release excess water capacity. Other threats include backwater flooding and drainage pump failures.

¹ Depending on whether the levee is a “project levee,” “direct agreement levee,” or “non-project levee,” current conditions and maintenance programs vary greatly for over 1,100 miles of levees in the Delta region. Under the authority of Public Bill No. 392, approved August 26, 1937, by the 75th US Congress, both the Sacramento and San Joaquin Project Levees are maintained and operated by the DWR through maintenance and operational assurances from local operating and maintaining partners like RDs and Maintenance Districts.

² The king tide is the highest predicted high tide of the year at a coastal location. It is above the highest water level reached at high tide on an average day. King tides are also known as perigean spring tides.

³ The king tide is the highest predicted high tide of the year at a coastal location. It is above the highest water level reached at high tide on an average day. King tides are also known as perigean spring tides.

⁴ The Pineapple Express meteorological phenomenon is associated with heavy precipitation from the waters adjacent to the Hawaiian Islands and can extend to any location along the Pacific coast of North America.



These events may produce localized flooding and losses to Holland Tract infrastructure and private property. Profound flooding caused by levee failure or overtopping remains a threat in this area as well.

Localized conditions or “special flood considerations” exist for every tract of land in the Delta region. Special considerations may include information on critical infrastructure, hydraulic features, and other information that could affect a flood-fighting strategy in a local setting. Table 1 presents the special flood considerations for Holland Tract; this information is also presented in Annex A – Flood Contingency Map.

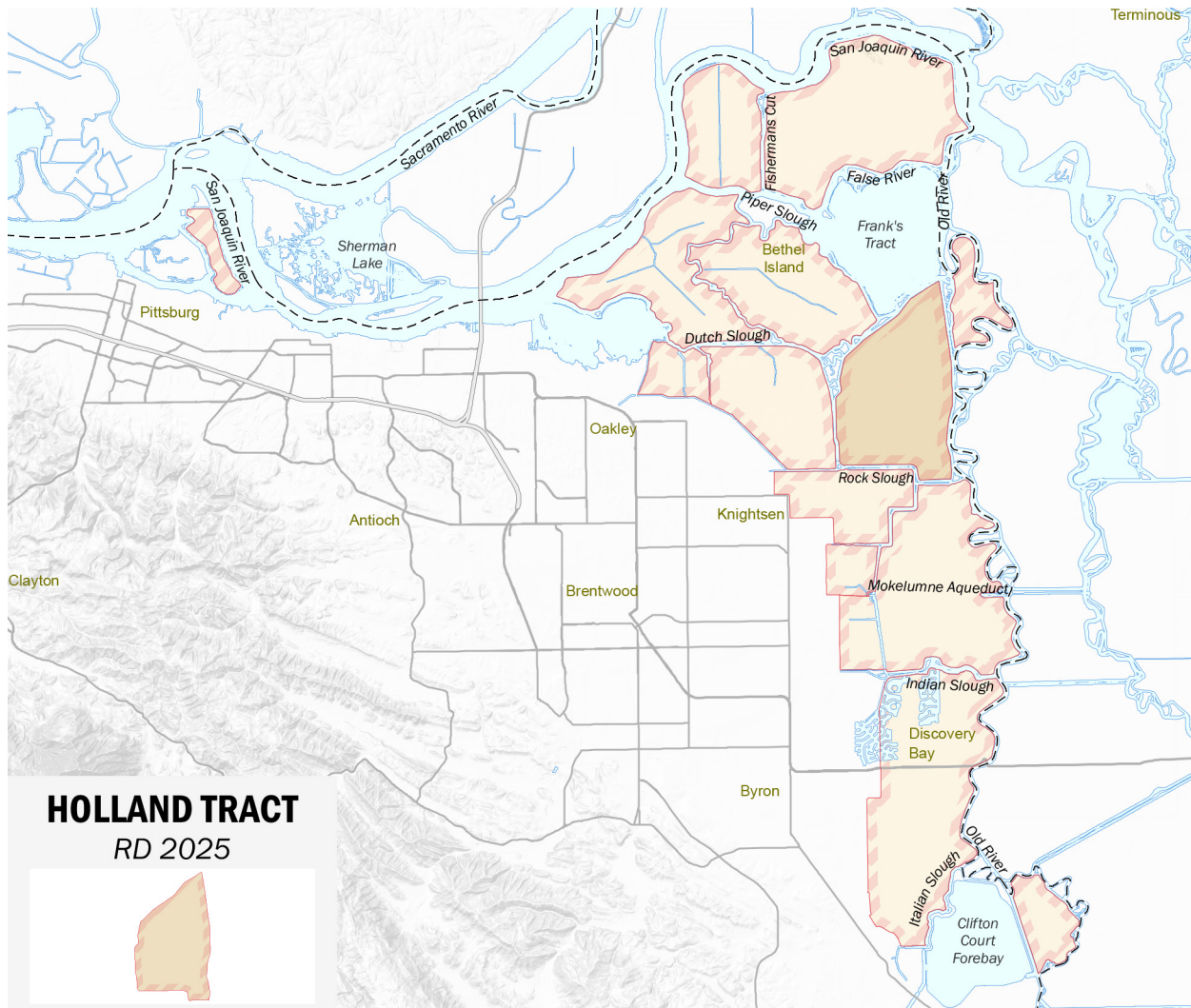


Figure 1: Holland Tract Regional Location



Table 1: Special Flood Considerations

| Symbol | SFC Number | Heading | Description |
|--------|------------|------------------------------------|--|
| | H1 | Pump Station 1 | Located near station 19+00. Discharge pump may be used during a major flood event; however, additional pumps would be required to dewater the island. |
| | H2 | Pump Station 2 | Located near station 73+00. Discharge pump may be used during a major flood event; however, additional pumps would be required to dewater the island. |
| | H3 | Pump Station 3 | Located near station 239+00. Discharge pump may be used during a major flood event; however, additional pumps would be required to dewater the island. |
| | H4 | Holland Tract Bridge | Holland Tract Bridge is the only motor vehicle egress for Holland Tract. A secondary bridge is located in the general vicinity of Sandmound Blvd. Contact the local Reclamation District to gain access to Sandmound Blvd in the event of an emergency. |
| | H5 | Franks Tract Open Water | The flooding threat is predominantly tidal, with some local runoff that can influence conditions. The Old River (on the east side of the island) could pose a riverine flooding threat. Franks Tract (large expanse of open water) can create erosion due to wind/waves. |
| | H6 | Wave Fetch | The wave fetch is relatively short on the southern, eastern, and western portions of the island and is generally not a concern over much of the District. The northern portion of the island has a wave fetch of up to 3.5 miles across Franks Tract. Channel widths generally vary from 150 to 1,450 feet. The levees are armored with riprap, except some areas along the southern and eastern levees. |
| | H7 | Levee Status | There is no levee certification status for Holland Tract. The levee geometry generally meets the PL 84-99 Delta Specific Standard. |
| | H8 | Tract Inhabitants | Two active marinas are located along the south levee (Lindquist Landing and Holland Riverside Marina), with up to 40 inhabitants living boats at any given time. |
| | H9 | Levee Access | County-maintained road is located on the crown of the south levee and portions of the east levee. |
| | H10 | Land Uses | Portions of the island are farmed or leased for grazing, with operations supported by various facilities and equipment. The island also has permanent habitat sites. |
| | H11 | Pump Station Infrastructure | Infrastructure includes pumping stations for drainage and associated electrical lines. |

See Annex A – Flood Contingency Map for Holland Tract jurisdictional boundaries, levees, pumping stations, supply depots, historical flooding summary, locations of past breaches, areas of historic seepage or erosion, topography, and characteristics of the waterways fronting Holland Tract levees.



2.2 General Approach to Seasonal Flood Operations

The levees are patrolled on a daily basis. The District Engineer tours and inspects the levees in his normal routine. The District Engineer inspects the levees as needed during the year to identify problem areas, which are then improved. Flood fight supply inventory is checked and updated.

2.2.1 Routine Preparedness and Infrastructure Maintenance

Levees are periodically inspected by the District Engineer and Reclamation District (RD) personnel. Problems are identified and actions taken as necessary. Pumps are operated and maintained by RD personnel and outside contractors. Pumps are inspected and maintained as necessary. Drainage ditches are cleaned on an as-needed basis.

2.2.2 Monitoring and Analysis

The Delta Tide Forecast is monitored using the Antioch Gauge (ANH). A secondary gauge, Holland Cut (HOL) near Bethel Island, is also monitored. The trustees and the District Engineer monitor weather reports.

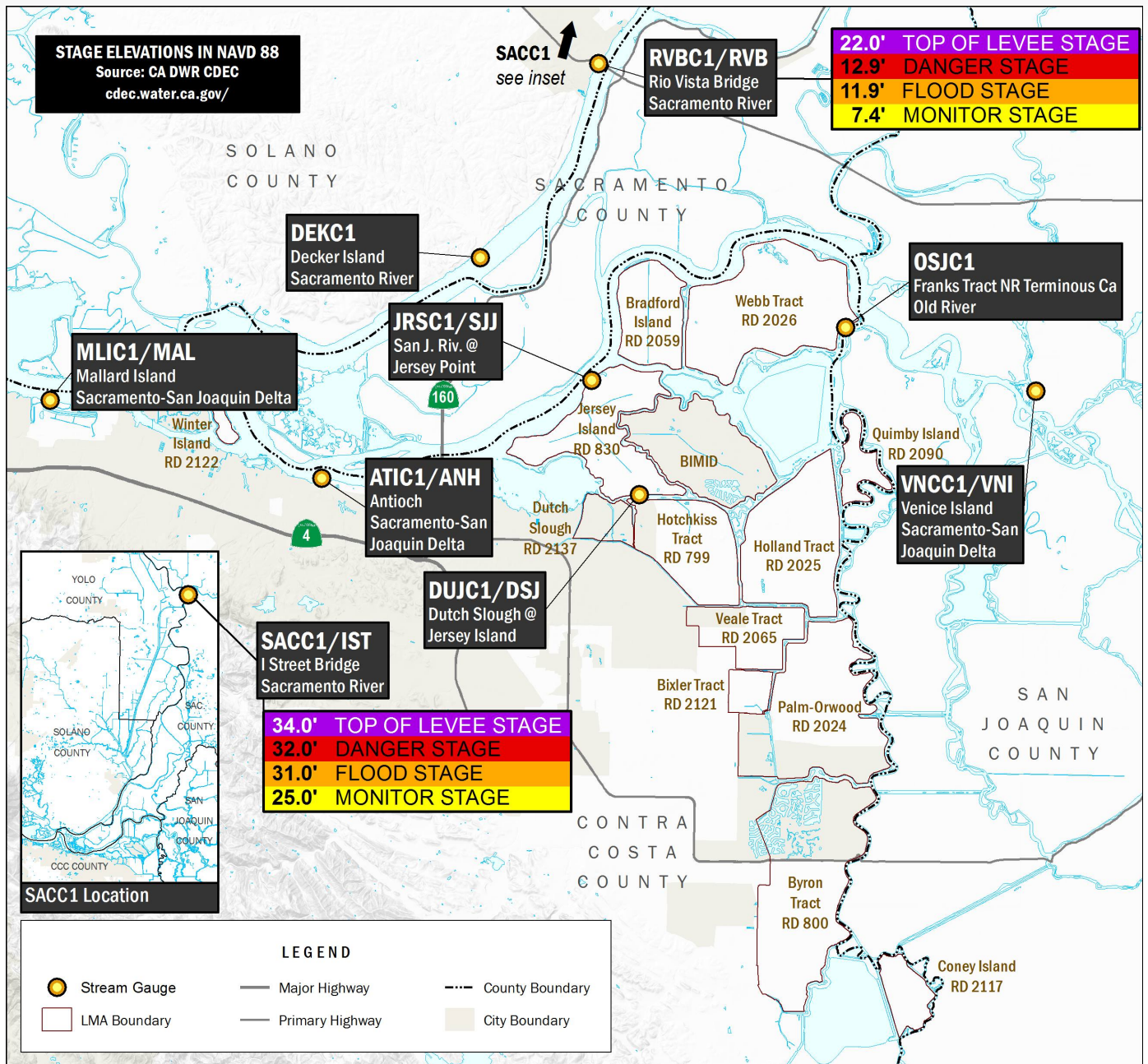


Figure 2: Stream Gauge Locations












| | | |
|--|---|---|
| <p>SACC1/IST <i>I Street Bridge</i> Sacramento River</p> <p>LIVE CHART</p>  | <p>RVBC1/RVB <i>Rio Vista Bridge</i> Sacramento River</p> <p>LIVE CHART</p>  | <p>DEKC1 <i>Decker Island</i> Sacramento River</p> <p>LIVE CHART</p>  |
| <p>MLIC1/MAL <i>Mallard Island</i> Sacramento-San Joaquin Delta</p> <p>LIVE CHART</p>  | <p>JRSC1/SJJ <i>San Joaquin River @ Jersey Point</i> San Joaquin River</p> <p>LIVE CHART</p>  | <p>OSJC1 <i>Franks Tract, Terminous</i> Old River</p> <p>LIVE CHART</p>  |
| <p>ATIC1/ANH <i>Antioch</i> Sacramento-San Joaquin Delta</p> <p>LIVE CHART</p>  | <p>DUJC1/DSJ <i>Dutch Slough @ Jersey Island</i> Dutch Slough</p> <p>LIVE CHART</p>  | <p>VNCC1/VNI <i>Venice Island</i> Sacramento-San Joaquin Delta</p> <p>LIVE CHART</p>  |

Figure 3: River Gauge Links

The **Rio Vista Bridge (RVBC1)** Stage Heights should be used to validate locally known high water marks. Figure 3 provides river stage height definitions for the Rio Vista Bridge; these definitions could be relevant in the event of high water in local operational areas.

DOWNLOAD AND VIEW INFORMATION ON LOCAL RIVER GAUGES AND TIDES FROM:

NWS: <http://water.weather.gov/ahps2/index.php?wfo=mtr>

California Data Exchange Center: <http://cdec.water.ca.gov/cdecstation/>

Download current National Oceanic and Atmospheric Administration (NOAA) observation. Keyhole markup (KMZ) Google Earth data for Weather Forecast Office San Francisco Bay Area, California here:

http://water.weather.gov/ahps2/download.php?data=kmz_obs&wfo=mtr

Delta Tide Forecast: <http://cdec.water.ca.gov/cgi-progs/rivfcst/TIDES>



2.2.3 Alerting, Activation, and Initial Response

Previously identified markers and information sources will be monitored and will trigger the response actions. Holland Tract staff may take these and additional actions when it is felt that conditions affecting the levees and drainage system warrant such action.

The primary gauge that is monitored is the Antioch Gauge (ANH). The 100-year flood elevation for this gauge is 9.4 feet (NAVD 88). Holland Tract staff will also take the following actions upon the identification, or verified report, of any out-of-the-ordinary condition on a Holland Tract levee that presents a potential risk:

Table 2: Antioch Gauge (ANH) Alert and Notification Monitoring Heights

| FT | Flood Stage Description |
|-----------------|--|
| EL. 8.9' | Emergency Response - River Flood Stage: Contact the Contra Costa County Sheriff's Office (responsible for public safety within Holland Tract) when there is a potential threat to levee integrity. |
| EL. 8.4' | Emergency Response - River Danger Stage: Initiate levee patrols when ANH reaches a stage of 8.4, or 1 foot below the 100-year flood elevation. |
| EL. 7.9' | Increased Readiness - Monitor/Preliminary Response Actions: Activate Levee Maintaining Agency (LMA) staff, LMA field command post, and/or emergency operations center when ANH reaches a stage of 7.9, or 1.5 feet below the 100-year flood elevation. |
| EL. 7.9' | Normal Preparedness (Routine Activities): Alert LMA board of directors/trustees and staff when ANH reaches a stage of 7.9, or 1.5 feet below the 100-year flood elevation. |

*About this gauge location: Latitude: 38.159722° N, Longitude: 121.686389° W, Horizontal Datum: NAD83/WGS84
Vertical Datum: NAVD88. Elevation information source; Survey grade GPS equipment, FEMA flood plain maps, newer
United States Geological Survey (USGS) topographic maps.*

The District does not use "phases," where objective conditions trigger a group of actions. Each action indicated will be taken upon reaching the trigger condition shown or if District staff feels it is warranted. As noted below, the District Engineer is responsible for monitoring objective conditions affecting the District.

The District Engineer will notify the Contra Costa County Sheriff's Office of identified threats to its levees or internal drainage system and will provide detailed information on the characteristics of the threat. The District Engineer will assist, to the greatest extent possible, with notification of residents if requested. This includes implementing an evacuation plan that includes a system for adequately warning the public in the event of a levee failure and evacuation.



IMPORTANT TO NOTE: For an unexpected levee failure or threat of imminent failure, contact the DWR Flood Operations Center (916-514-2619) for emergency response assistance and flood fight strategy.

2.3 Flood Fight Operations

Annex A—Flood Contingency Map displays Holland Tract’s concept of operations for emergency communications and patrol for the period before State or Federal agencies assume control over the flood fight and dewatering operations. This concept of operations will be modified as needed to meet the demands of actual emergency conditions.

2.3.1 General Flood Fight Strategy for High Water Events

The general flood fight strategy will be to protect the perimeter or primary levees protecting people and property. Emergency flood fight measures should be coordinated and supervised by RDs, LMAs, and/or a combination of levee owners and flood control device operators. The primary flood fight strategy is to patrol primary levees, ensure flood control devices remain operational, and monitor the situation for any levee distress or threat of imminent failure.

The flood fight personnel will coordinate levee patrols with county, State, and Federal teams assigned to assess and/or fight flooding on private, State, and Federal levees. County Emergency Services should be contacted to address imminent failure threats. County Emergency Services should coordinate action planning between levee districts and State/Federal agencies and provide logistical support when necessary. In the event that access from land or water is restricted due to the flood, local flood fight personnel will monitor and arrange to implement emergency access plans with the specific county Office of Emergency Services (OES) in the region.

For an unexpected levee failure or threat of imminent failure, contact the DWR Flood Operations Center (916-514-2619) for emergency response assistance and flood fight strategy.

GENERAL FLOOD FIGHT ACTIONS:

- 1) Upon receipt of high water notification, the local maintaining agency should establish a levee patrol, form a skeleton organization capable of quick expansion, and assign individuals to have charge of specific sections of levees. In order to provide proper condition assessments, maintain an adequate number of patrol and flood fight personnel.
- 2) Maintain detailed inspection reports, particularly with reference to the following matters: condition of levees and recent repairs, road crossings or other locations where the levee is below grade, culverts, flap gates, sluice gates and trash racks. Report all levee erosion, slumping, seepage and/or boils forming.
- 3) Obtain and distribute necessary tools and flood fight materials (sacks, sandbags, brush, lumber, lights, etc.) at points where flood maintenance is anticipated. Fill any holes or washes found in the levee with compacted material. Repair gaps where road crossings have worn down the levee crown or other locations where the levee is below grade; identify any right-of-way encroachment that could impede access and efficient operation, and determine any action required.
- 4) If flooding is imminent, make requests as appropriate to local, State, and Federal personnel for assistance with flood fight resources. Verify evacuation plans with emergency response agencies. Verify and establish supply staging areas, procure and pre-position equipment, establish a plan for moving resources into the area in the event that land access is degraded. Review



specific protective actions to protect vital facilities in event of flooding. Evaluate a secondary line of defense if primary levees fail (i.e., required height of inland levees and Preliminary Engineering Design (PED) plans, if they exist). Calculate the amount of material necessary to implement the PED and other protection methods, and coordinate with local suppliers and emergency management (EM)ROC personnel. Verify emergency power to maintain pump stations and other flood control structures. Locate transportation resources, including available trucks and heavy hauling equipment.

2.3.2 Flood Contingency Options

The main causes of levee failure or flood-related problems due to high water are:

- Overtopping resulting from water-surface elevations higher than the levee or embankment;
- Seepage through or under the levee that is heavy enough to cause a “boil;” and
- Erosion of the levee or embankment due to swiftly moving water or wave action.

2.3.2.1 General Flood Fight Options

GENERIC SCENARIO: OVERTOPPING (RAINY DAY TIDE/RAIN)

If any levee reach or stream bank is lower than the anticipated high water elevation, an emergency topping should be constructed to raise the grade above the forecast flood height. A sack topping may be required at road or stock crossings, low levee sections, or railroad crossings. The following sections discuss various methods for increasing levee and bank elevations.

FLOOD FIGHT METHOD 1: SACK TOPPING

The most common form of flood control work is using sandbags to construct temporary walls. The use of sandbag walls to increase the height of a levee section is called “sack topping.” The sacks are laid as “stretcher rows,” or along the levee. The sacks should overlap by at least one-third of the bag and be stomped firmly into place. When properly placed and compacted, one sack layer will provide about 3 to 4 inches of topping.

NECESSARY MATERIAL FOR 100 FEET OF LEVEE PROTECTION:

Sandbags

- 600 – 1 foot high x 100 linear feet
- 2,100 – 2 feet high x 100 linear feet
- 4,500 – 3 feet high x 100 linear feet
- 7,800 – 4 feet high x 100 linear feet

Sand or similar earthen material (0.5 cubic feet per sandbag)

- 300 cubic feet – 1 foot high x 100 linear feet
- 1,050 cubic feet – 2 feet high x 100 linear feet
- 2,250 cubic feet – 3 feet high x 100 linear feet
- 3,900 cubic feet – 4 feet high x 100 linear feet



Labor: 3-person team fills 2 bags per minute average over an hour, or 120 bags per hour

- 5 hours – 1 foot high x 100 linear feet
- 17.5 hours – 2 feet high x 100 linear feet
- 37.5 hours – 3 feet high x 100 linear feet
- 65 hours – 4 feet high x 100 linear feet

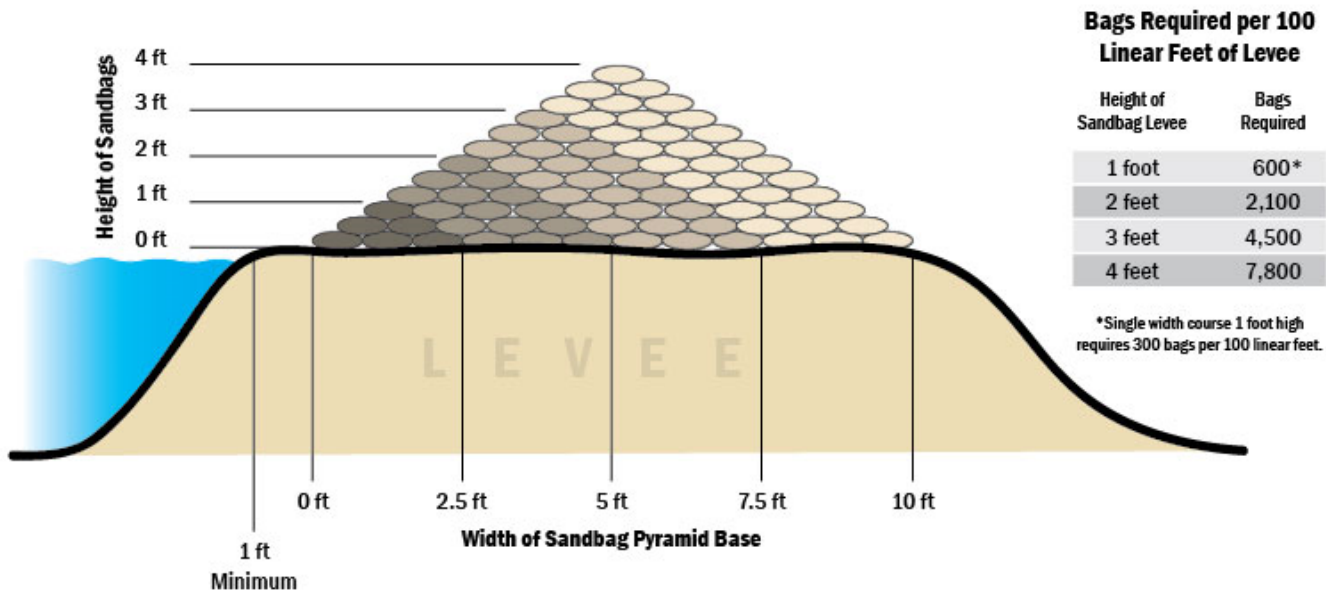


Figure 4: Levee Sack Topping Diagram

FLOOD FIGHT METHOD 2: TEMPORARY EARTHEN LEVEE

This method is used to raise low areas during high water periods to prevent overtopping of levees, stream and riverbanks, small earthen dams, roadways, etc. To raise low areas, unfold a 20-foot x 100-foot x 10-mil roll of plastic sheeting and lay it out flat on the area to be raised. Place fill material on the plastic. Fold the plastic over the material, and lay a single row of sandbags on the backside lip of the plastic and on all seams. Fill material can be placed using a bottom dump or dump bed truck or a front-end loader, or manually.

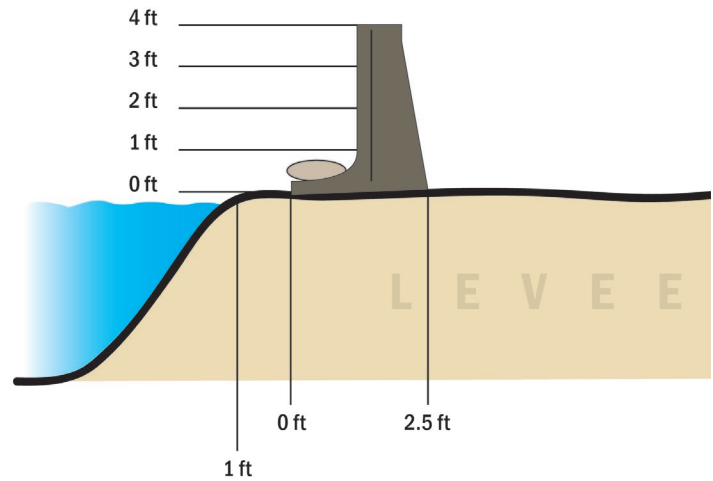
NECESSARY MATERIAL FOR 100 FEET OF LEVEE PROTECTION:

- 2 rolls of 10-mil plastic sheeting
- 4.5 cubic yards of earthen material
- 30 sandbags



FLOOD FIGHT METHOD 3: MUSCLE WALL TEMPORARY LEVEE (2-FOOT WALL)

Muscle Walls are water-filled, rigid, molded plastic containers that are interlocked on site by manually lifting a container's tongue end over the groove end of another container and sliding them together. Each container is 6 feet long, 2 feet high, and 2.5 feet wide, and provides an impervious water barrier (apron and wall). The minimum footprint is 10 feet of width to accommodate a 4-foot apron, the barricade, and a 4-foot monitoring and seepage management area. This is designed for even and firm terrain with minor seepage on impervious surfaces.



NECESSARY MATERIAL FOR 100 FEET OF LEVEE PROTECTION:

- 10 sandbags for every section of Muscle Wall
- Gloves
- 500-1,000 feet of string
- Trash pump
- Forklift
- Lifting dolly
- Gorilla tape
- Pressure washer
- "Great Stuff" foam sealant (for impervious surface)
- 2 razor knives
- Trencher
- Shovels
- 200-foot measuring tape
- Marking paint
- 2 sledgehammers

Figure 5: Muscle Wall



GENERIC SCENARIO: BOIL

Boil is a condition that occurs when water is “piped” through or under a levee and resurfaces on the landside. These weak points are generally caused by burrowing rodents or decomposed tree roots. High water pressure can begin to erode the interior of the levee and weaken the structure. Levee material will deposit around the exit point as the water discharges on the landside. If the boil is determined to be “carrying material,” then corrective action is required to control the situation. If left unattended, the material that makes up the levee can be eroded at an accelerated pace, causing subsidence and overtopping of the levee. This could result in a levee break.

FLOOD FIGHT METHOD: COMMON BOIL CONTROL

The common method for controlling a boil is to create a watertight sack ring around it. The sandbag structure should be high enough to slow the velocity of the water and prevent further discharge of material from the boil. The flow of water should never be stopped completely, since this may cause the boil to “break out” in an area near the existing sack ring. A spillway must be constructed to direct water away from all boil sites. The sack ring should be large enough to encompass the area immediately surrounding the discharge point (3 to 4 feet in diameter). If several boils carrying material are found, a single large sack ring may be constructed around the entire “nest” of boils.

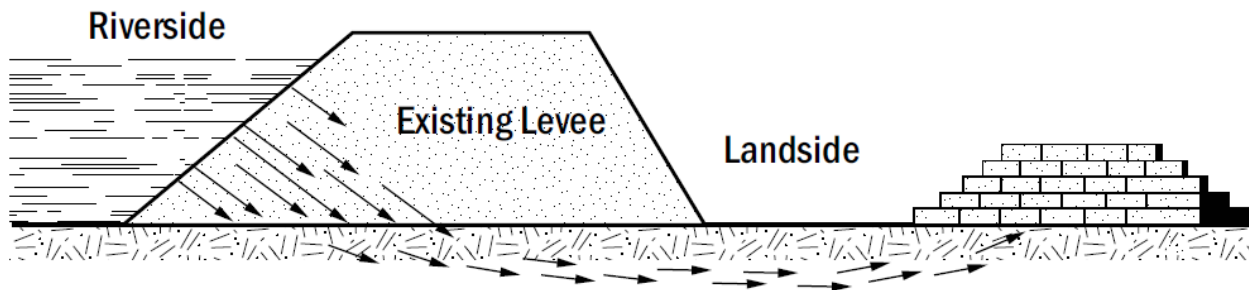


Figure 6: Levee Boil Diagram

FLOOD FIGHT METHOD: LEVEE SLOPE BOIL CONTROL

If the boil is close to or on the levee slope, a U-shaped sack ring may be built around the boil and keyed into the slope. Construction of this method can be difficult and requires substantial shoring up of the U-shaped sack ring structure. A spillway must be constructed to direct water away from all boil sites.

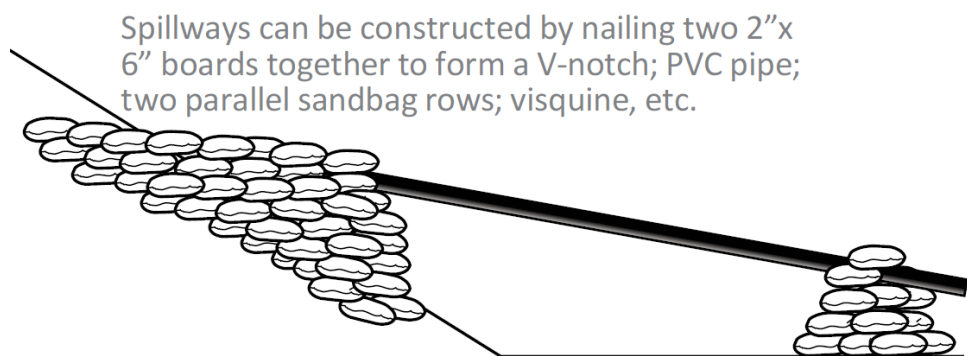


Figure 7: Boil on Levee

**NECESSARY MATERIAL FOR 100 FEET OF LEVEE PROTECTION:**

- 100 sandbags per boil
- 15 cubic feet of sand or similar earthen material

GENERIC SCENARIO: WIND / WAVE WASH

All levees adjacent to wide stretches of water should be watched during periods of strong wind, to detect the early stages of wave wash erosion. If the slope is well sodded, short periods of high wind should cause little damage. However, during sustained periods of strong wind and high water, experienced personnel should observe and monitor the affected areas.

FLOOD FIGHT METHOD: ENVELOPE WAVE WASH PROTECTION

When used correctly, plastic sheeting is useful for wave wash protection. Visqueen should be purchased in 10-mil rolls, 20 feet wide by 100 feet long. Drive 1-inch x 3-inch x 2-foot wooden stakes into the ground just above the levee shoulder on the side you wish to protect. Place the stakes 4 feet apart and stagger vertically by 1 foot.

Avoid driving stakes in a straight line; this can cause cracking and sloughing of the slope. To provide added strength and leverage, drive stakes at a slight angle away from the water source with the wide (3-inch) side facing the water. Be sure the stakes are well into the ground and are secure.

When rolling out the plastic sheeting, it is helpful to use a shovel or similar long-handled tool. Eight to ten people should assist in shaking out the folds of the envelope. Be sure that both layers are held while the envelope is shaken out.

While flood workers hold the plastic securely, toss tied sandbags into the bottom of the envelope, with a 1-foot gap between bags. The tied bags provide weight to hold the plastic against the levee slope.

A tie-down button or small stone (preferably round) is secured through both layers of Visqueen. If a stone is used, tie a slipknot and double half-hitch to secure it. Fasten buttons to the Visqueen and tie off to the stakes using a minimum 250-lb. tensile strength twine with these points in mind: the plastic sheeting is secured using tie down buttons. To attach plastic buttons to the plastic, tie a slipknot on the end of the twine; slip loop over button and plastic, and draw tight. Tie two half-hitch knots around the throat of the plastic sheeting.



NECESSARY MATERIAL FOR 100 FEET OF LEVEE PROTECTION:

- 2 rolls (20 feet x 100 feet) of 10-mil plastic sheeting
- 30 sandbags
- 2 rolls twine
- 10 plastic buttons or rocks
- 20 1-inch x 3-inch x 2-foot stakes
- 15 cubic feet of sand or similar earthen material

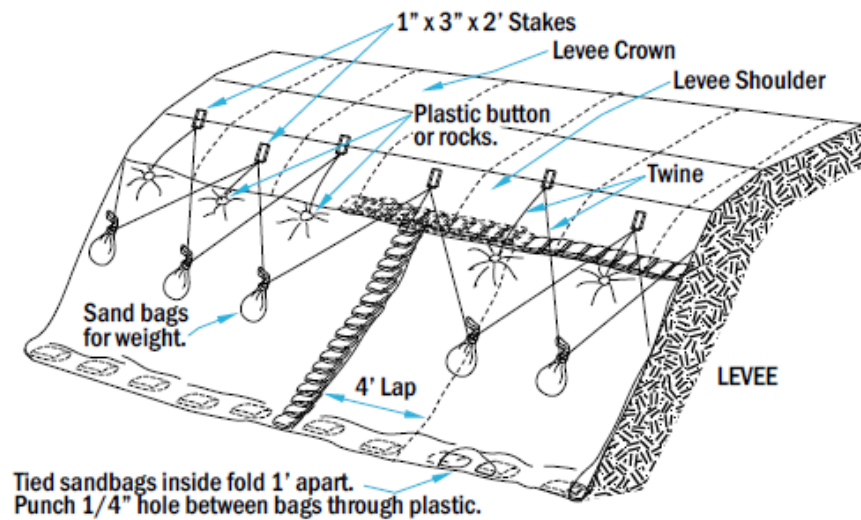


Figure 8: Envelope Wind Wave Protection Method

2.3.2.2 Local Flood Contingency Planning Scenarios

Flood contingency planning is preparation for flood hazards centered upon specific situations that may happen during high-water events; it is based upon a complete operational picture that includes historic information, special hydrologic considerations, planned engineering events, and resource availability.

Depending on the local landscape, resource availability, and expected flood direction, special actions and responsibilities for flood fight strategies may change based upon the real-time situation. Multiple flood fight strategies may be developed based upon failures of particular levees, location of threats, the value of the land, and/or population densities. The planned actions or “flood contingency planning” can reduce the risk of catastrophic damage and enhance the ability of emergency operators to make sound decisions quickly. Table 2 presents flood contingency options for Holland Tract; this information is also presented in Annex A – Flood Contingency Map.



Table 2: Flood Contingency Options

| Symbol | FCO Number | Heading | Description | Actions |
|--------|------------|-------------------------|---|--|
| | H1 | High Water Event | Multiple high water events caused by large volumes of discharge from regional and local drainage systems, coupled with tides and low atmospheric pressure. Vulnerable area approximately 2,000 feet. Muscle wall or temporary earthen levee is recommended. | <p>The District maintains stockpiles of riprap on the island and has equipment available to perform levee maintenance and repairs.</p> <ol style="list-style-type: none"> 1. Deploy flood fight materials to prevent levee degradation and activate the workforce for levee patrols. 2. Prepare resources for a temporary earthen levee or muscle wall. <p>Muscle Wall Material Required:</p> <p>A 2,000-foot temporary levee will require approximately 334 segments of muscle wall, 3,340 sandbags, or 1,670 cubic feet of sand.</p> <p>OR</p> <p>Temporary Earthen Levee Material Required:</p> <p>A 2,000-foot temporary earthen levee (2 feet high x 4 feet wide) will require approximately 40 rolls of 10-mil plastic sheeting, 600 sandbags, or 90 cubic yards of fill. Approximately 11.1 cubic yards of fill are needed for sandbags, and 78.9 cubic yards for Visqueen fill.</p> |
| | H2 | Wave Wash | Wind waves could occur at this location. Wind waves causing erosion will lead to levee failure if not addressed for long periods of time; protection area approximately 1,000 feet. | <p>The District has flood fight materials stored on-island for use during a flood fight.</p> <ol style="list-style-type: none"> 1. Deploy flood fight materials to prevent levee degradation. 2. Protect area exposed to wind waves with envelope-style wrap. <p>Wave Wash Protection Material Required:</p> <p>1,000 feet of envelope wave wash will require approximately 20 rolls of 10-mil plastic sheeting, 300 sandbags, 150 cubic feet of sand, 20 rolls of twine, 100 plastic buttons or rocks, and 200 [1-inch x 3-inch x 2-foot] stakes.</p> |
| | H3 | Boil | Boil events caused by large volumes of discharge from regional and local drainage systems, coupled with tides and low atmospheric pressure. | <ol style="list-style-type: none"> 1. Protect area exposed to wind waves with boil ring. |



2.4 Federal and State Disaster Assistance

The District's policy is to maintain mitigation and emergency plans and procedures, as well as the physical condition of its levees, at the level required to be eligible for disaster assistance under the Federal Stafford Act program as well as the California Disaster Assistance Act (CDAA). Emergency operations will be conducted and documented in compliance with conditions of those programs for reimbursement of disaster expenses. To ensure that the District takes steps to quickly access the recovery process, these actions should be considered if an incident is imminent or occurring:

- Ask Contra Costa County to proclaim the existence of a local emergency
- Notify the District administration when the proclamation is established

The **District Engineer** will also maintain documentation during the event and process claims during the recovery period.

Holland Tract is not in the Flood Control Subventions Program, which provides financial assistance to entities cooperating in the construction of federally authorized flood control projects. RD 2025 may consider the following:

STATE AND FEDERAL SUPPORT DURING THE EMERGENCY PHASE:

- Holland Tract may consider requesting support from the county and DWR during the Emergency Response Phase. California Mutual Aid and U.S. Army Corps of Engineers (USACE) assistance are available when resources beyond local capabilities are needed for flood fighting operations.

EMERGENCY PHASE SUPPORT FOLLOWING FLOODING:

- If the county declares a disaster, the Governor may support it by proclaiming a State of Emergency and then asking the President of the United States to make a National Disaster Declaration for the affected area.
- If the President declares the area a national disaster, assistance from FEMA will be requested.
- If residential flooding occurs, regardless of the declaration, the USACE can provide Federal funds for recovery operations for up to 30 days following the incident.
- USACE assistance can also be requested to repair eroded and damaged levees following high flows. Request for this authority must be made in a timely manner (30 days).

2.5 Evacuation Plan

The Contra Costa County (CCCO) Sheriff's Office is responsible for alerting, warning, and evacuating the public through the CCCO Operational Area using the procedures contained in the CCCO Emergency Operations Plan. If there is imminent threat of a failure of the levees or an actual breach occurs, the District is responsible for calling 911 to initiate the evacuation of the residents under the direction of the Sheriff's Department. The Board and/or District Engineer will also assist, to the greatest extent possible, with notification of residents if requested. Ultimately the Sheriff's office will conduct the actual evacuation with Office of Emergency Services (OES) assistance.

Residents with special transportation and evacuation needs exist in this area and should be coordinated through the County Sheriff's Department and OES. Rally Point locations serve as safe havens that accommodate evacuees waiting further instructions for sheltering and provide protection from inclement weather. The primary mode of transportation in an evacuation will be privately owned vehicles. However, some individuals may not own a car or, for whatever reason, cannot drive or in an emergency may not choose to drive. Supplemental transportation resources must be provided for these "carless" populations by the County OES.



SECTION 3. ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES

3.1 Organization

The **District Board of Supervisors** will use its paid, contract, and volunteer staff to perform its responsibilities in a flood emergency.

3.2 Assignment of Responsibilities

There are no specific limitations on the level of authority; however, the trustees consider the current financial state of the District prior to making decisions. Conditions vary, so each situation is evaluated on a case-by-case basis.

The following are assignments of authority and responsibility to ensure that needed emergency actions can be taken promptly and efficiently.

DISTRICT ENGINEER DUTIES

The **District Engineer** is in charge of emergency levee patrols and emergency response and shall use judgment as to when to initiate emergency patrols. Emergency patrols supplement the regular levee patrols performed by the District Engineer during normal working hours. Generally, emergency patrols are to be initiated after earthquakes and during severe storms, winds, and periods of high water. The District Engineer contacts the county sheriff and the Office of Emergency Services upon deciding to initiate an emergency patrol. The District Engineer will supply the manpower and vehicles to patrol the levee.

The **District Engineer** is authorized to hire contractors or purchase supplies to perform work to stabilize a levee problem. The **District Engineer** may request help, including engineering assistance and flood fighting, from the State Department of Water Resources by calling the Flood Operations Center at 916-574-2619 at any time. The **District Engineer** shall make every effort at any expense to prevent a levee break, but if the levee does break, the Sheriff's Department will be notified that evacuation assistance is required.

OPERATIONAL AREA FLOOD CONTROL OPERATIONS

The Contra Costa County Operational Area Flood Operations are coordinated through its Emergency Operations Center (EOC). The EOC ensures proper communication and coordination among all entities responding to the flood.

MUTUAL AID REGIONS AND REGIONAL SUPPORT

Mutual Aid requests go to the Regional Emergency Operations Center (REOC) for the Inland Region. Reclamation Districts will only supply what they can without endangering their own response capability. The REOC may then request resources from the State Operations Center, Department of Water Resources (DWR), and USACE.

STATE FLOOD CONTROL OPERATIONS

DWR is responsible for State flood control operations through its Flood Operations Center, the Division of Flood Management, other divisions, and their flood management and flood fight technical experts. DWR coordinates with the USACE, the U.S. Bureau of Reclamation (USBR), and other agencies. DWR also operates the California Data Exchange Center (CDEC), which monitors



rainfall, stream flow, river stages, and reservoir releases across the State. DWR will work with other State agencies as needed during flood emergencies.

FEDERAL FLOOD CONTROL OPERATIONS

The USACE and the USBR have responsibilities for Federal flood activities in California. The USACE has a major responsibility for overseeing reservoir releases and supporting the State's effort in maintaining the levees and structures associated with the State Plan of Flood Control. The USACE can support emergency work as requested by the State under Public Law 84-99, which includes levee flood fighting.

3.2.1 Legal and Financial Commitments

- 1) The **Board Chairman or Secretary** is authorized to make legal/financial commitments during emergency operations;
- 2) The **Board Chairman or Secretary** is authorized to initiate and sign emergency contracts with private vendors or other public agencies; and
- 3) The **Board Chairman or Secretary**, if assigned, is authorized to speak to the media on behalf of the LMA and participate in any established Operational Area Joint Information Center (JIC).

3.2.2 Emergency Equipment, Supplies, and Resources Maintenance

The **District Engineer** is authorized to purchase supplies and equipment in an emergency situation and is authorized to ask the Operational Area logistics section to acquire resources on behalf of Holland Tract. The **District Engineer** is responsible and authorized to maintain LMA equipment, supplies, and resources needed for emergency response. Others may be responsible as directed by the Board of Trustees. Supplies meet minimum requirements issued by DWR.

3.2.3 Water Conditions, Elevations, and Forecast Monitoring

The best possible strategy for any possible emergency is prevention. The **District Engineer** is responsible and authorized to monitor water conditions, elevations, and forecasts for the purposes of identifying conditions warranting additional preparedness action beyond routine flood season preparedness.



3.2.4 Staff and Activation during Emergency Operations

The **District Incident Commander**, as assigned by the **Board Chairman**, is authorized and responsible for:

- 1) Activating Holland Tract flood fight resources;
- 2) Directing/supervising Holland Tract personnel, contractors, and other staff provided to Holland Tract under mutual aid;
- 3) Requesting from, or providing assistance to, other RDs under mutual aid provisions; and/or
- 4) Directing flood fight operations. This includes at a minimum, responsibility for organizing and directing levee patrols, organizing and directing flood fight actions, organizing and directing flood water removal activities, and organizing and directing financial and recovery activities (if attainable).

The **District Engineer** is authorized and responsible for organizing and directing financial and recovery activities.

3.2.5 Expenditures, Emergency Actions, and Mutual Aid Documentation

The **District Engineer** is authorized and responsible for:

- 1) Documenting Holland Tract expenditures and emergency actions;
- 2) Documenting damage to Holland Tract infrastructure; and
- 3) Preparing and submitting disaster assistance claims during the recovery period.



INTENTIONAL BLANK PAGE



SECTION 4. DIRECTION, CONTROL, AND COORDINATION

4.1 Management and Control of Operations and Coordination

Holland Tract staff are authorized and responsible for carrying out the actions outlined in Section 3, Organization and Responsibilities, and will use the direction, control, and coordination facilities and processes described in this section.

The District Board of Trustees shall meet and confer as deemed necessary by the Chairman during emergency operations to perform their policymaking and financial responsibilities during emergency response operations. Board meetings will occur in the field or, if needed, at the office of the District at 343 East Main Street, Suite 815, Stockton, California 95202.

4.1.1 Management and Policy

The District Board of Trustees shall meet and confer as deemed necessary by the Chairman during emergency operations to perform their policymaking and financial responsibilities during emergency response operations. Board meetings will occur in the field or, if needed, at the office of the District at 343 East Main Street, Suite 815, Stockton, California 95202.

4.1.2 Incident Command Facilities

The District does not maintain pre-identified facilities for hosting emergency activities being undertaken by District staff. The District's principal and official office is at 343 East Main Street, Suite 815, Stockton, California 95202. District activities will be organized and coordinated in the field, or at other incident command facilities established by public safety agencies or the Contra Costa County Operational Area at the time of the emergency, as appropriate.

Refer to Annex A – Flood Contingency Map for specific strategies. The Incident Command Facility location is also identified on Annex A – Flood Contingency Map.

4.2 Management and Coordination with Other Jurisdictions

The **District Engineer** of Holland Tract will ensure that proper management and coordination are maintained with 1) other public agencies and jurisdictions operating within Holland Tract, 2) neighboring Reclamation Districts, and 3) the Contra Costa County Operational Area.

4.2.1 Unified Flood Fight Command Post

Holland Tract does not belong to a pre-planned designated unified flood fight command post but may be requested to participate in a unified field command post provided by another Reclamation District or the county if providing mutual aid.

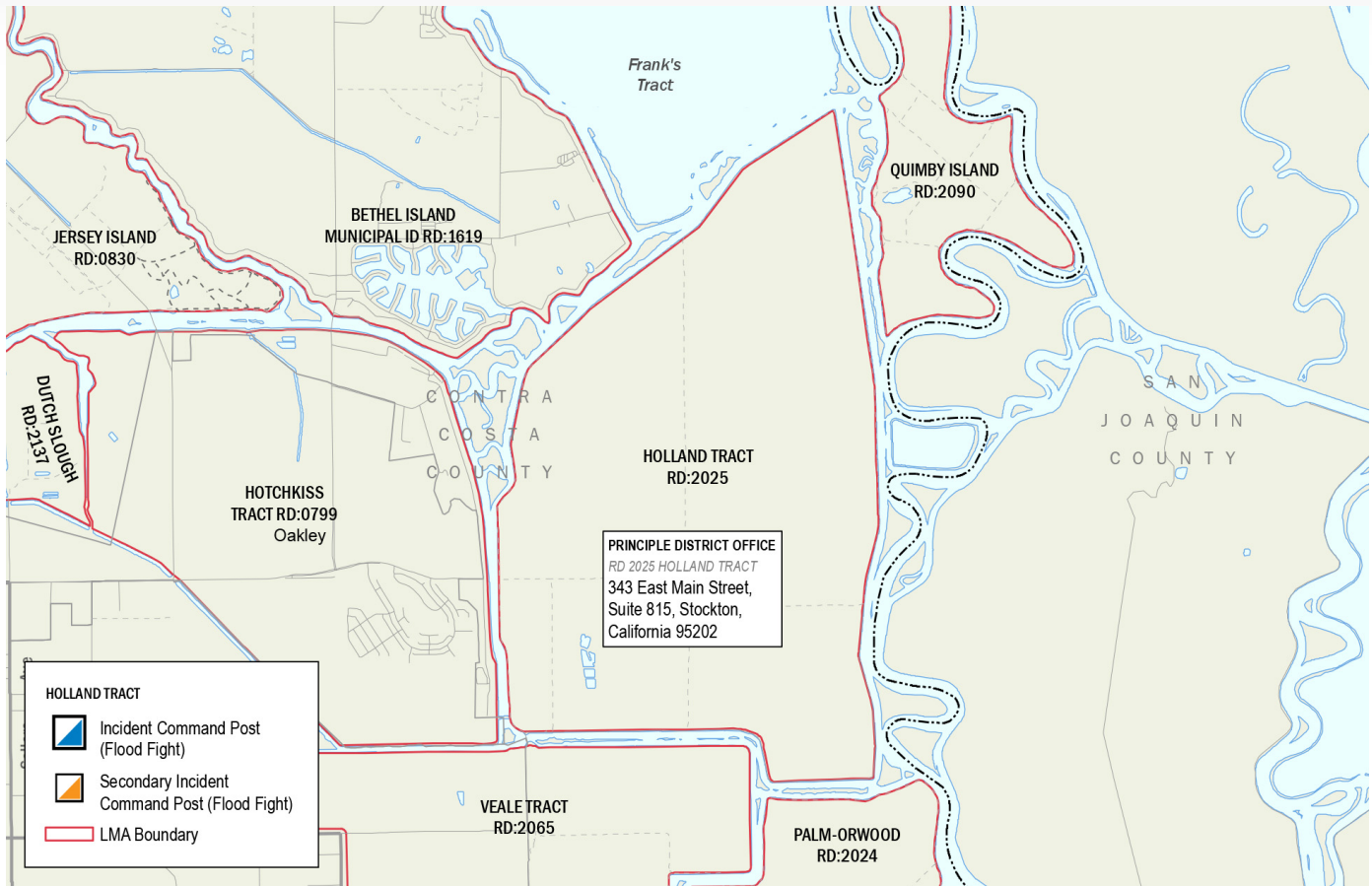


Figure 9: LMA Boundaries and Incident Command Post (ICP) Locations

4.2.2 Operational Area Emergency Operations Center

Contra Costa County maintains and hosts an operational area Emergency Operations Center (EOC) at 50 Glacier Drive in Martinez, California. The operational area management group (MAC) will prioritize allocation of resources including mutual aid, share information, and conduct coordination processes in accordance with the multi-agency coordination system (MACS) procedures maintained by the Contra Costa County Office of Emergency Services.

The Operational Area Planning/Intelligence Section may provide disaster intelligence and situational status to RD 2025 - Holland Tract upon activation in an emergency. Holland Tract does not attend operational area meetings and activities, but communication can occur via phone or internet-based solutions.

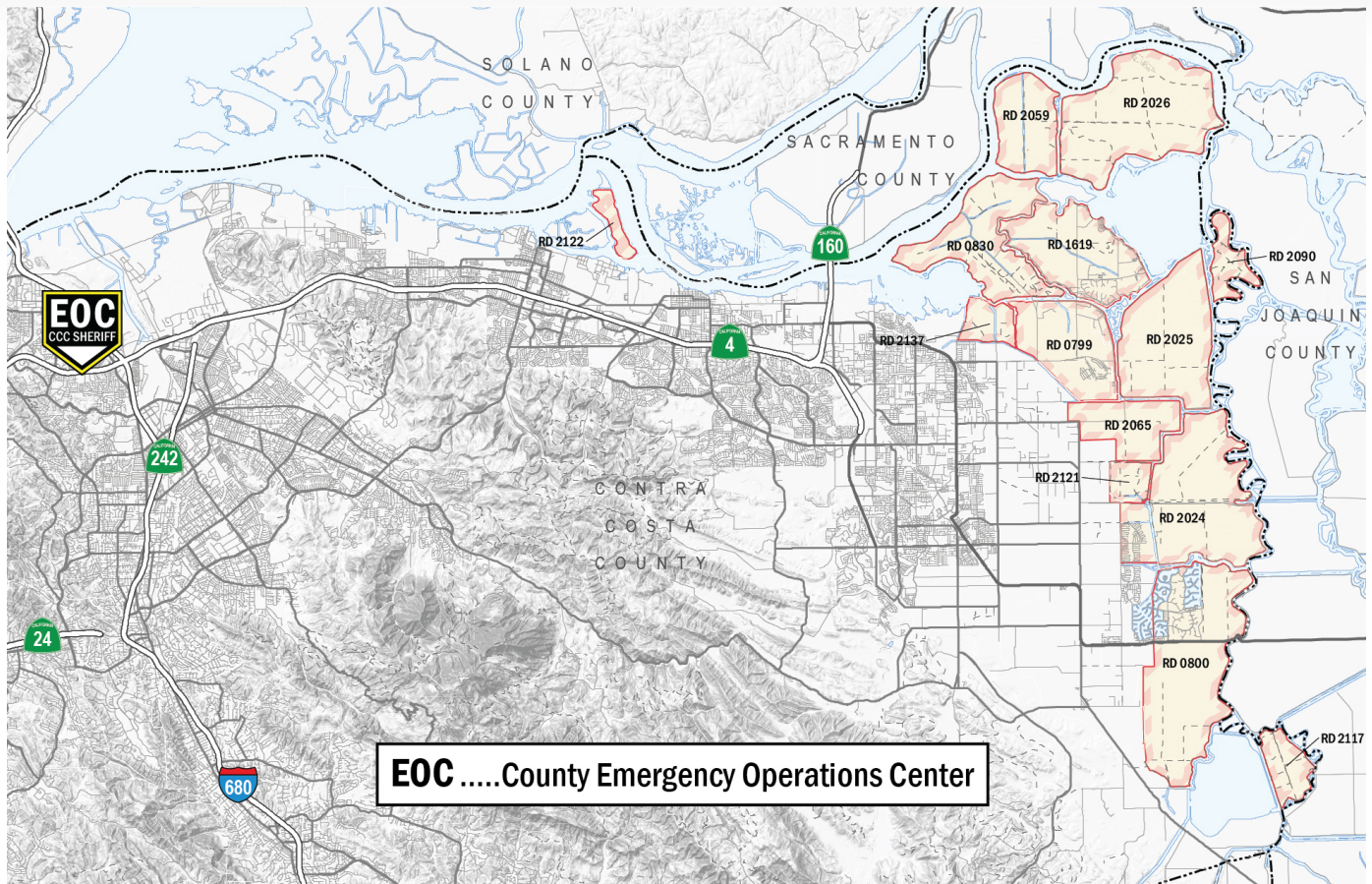


Figure 10: Regional EOC & ICP Map

4.2.3 State-Federal Flood Operations Center

DWR maintains the State-Federal Flood Operations Center (FOC) to perform these functions and support the operations of other State and Federal agencies. Holland Tract will maintain communication with the FOC in order to receive information from and provide information to that facility and to request technical assistance. Communication can occur via phone or internet-based solutions.

4.2.4 Operational Area Joint Information Center

Risk communication to the general public, including the seasonal workers and residents of Holland Tract, will also be coordinated, planned, and carried out through the Contra Costa County Operational Area Joint Information Center (JIC). Holland Tract will assist with communicating risk to its residents as requested through the Operational Area.

The **District Engineer** may serve as Holland Tract's Information Officer as requested by the JIC and will have the authority to approve information releases.



INTENTIONAL BLANK PAGE



SECTION 5. COMMUNICATION

5.1 Communication Organization

Holland Tract maintains adequate communications equipment to implement this plan, which includes communicating with the following:

- 1) Holland Tract staff, contractors, and other personnel working under Holland Tract supervision;
- 2) Other public agencies that may be operating within Holland Tract;
- 3) Neighboring Reclamation Districts;
- 4) Contra Costa County Operational Area EOC; and
- 5) State Flood Operations Center.

5.2 Communication within Holland Tract

Holland Tract's equipment ensures that communication with the following can take place:

- 1) Holland Tract staff;
- 2) Levee patrols; and
- 3) Holland Tract staff, contractors, and volunteers conducting flood fight activities.

Cell phones and email are the primary communications equipment. No radios/frequencies or phone numbers have been assigned for particular functions.

5.3 Communication with Other Jurisdictions

The District will maintain communication with other jurisdictions by cell phones and by participation in meetings as appropriate.

5.3.1 Operational Area Emergency Operation Center

Holland Tract will establish and maintain adequate communication with the Contra Costa County EOC primarily via cell phones. The District office also has a land line and fax/email capabilities.



5.3.2 Department of Water Resources State-Federal Flood Operations Center

The District will communicate with the FOC by cell phone. Additional communications equipment may also be provided to ensure contact.

Table 3: Contact Information

| COUNTY OFFICES | |
|---|------------------------------------|
| Contra Costa County Sheriff's Office/Department | 911 or 925-646-2441 |
| Contra Costa County Office of Emergency Services (OES) | 925-228-5000, 24-Hour |
| Contra Costa County Fire Protection District (Rescue) | 925-941-3330 |
| Contra Costa County Public Works Department (Debris Management) | 925-427-8562 |
| RESPONSE SUPPORT | |
| DWR State-Federal Flood Operations Center (Coordination for Support) | 916-574-2619 |
| Caltrans (Evacuation/Bridge Support) | 916-654-2852 |
| California Conservation Corps (Environmental/Disaster Response) | 916-341-3100 |
| DISTRICT CONTACTS | |
| Bixler Tract (RD 2121) | C: 925-550-5540 H: 925-634-0310 |
| BIMID (RD 1619) | O:916-631-4534 C:916-505-4106 |
| Bradford Island (RD 2059) | 925-684-3222 or 925-209-5480 |
| Byron Tract (RD 800) | 925-634-2351 |
| Coney Island (RD 2117) | 209-465-5883 |
| Dutch Slough (RD 2137) | 209-943-5551 |
| Holland Tract (RD 2025) | 209-943-5551 |
| Hotchkiss Tract (RD 799) | 925-684-2398 |
| Jersey Island (RD 830) | 925-625-2279 |
| Palm-Orwood Tract (RD 2024) | 209-465-5883 |
| Quimby Island (RD 2090) | 209-943-5551 |
| Veale Tract (RD 2065) | 209-465-5883 |
| Webb Tract (RD 2026) | 209-943-5551 |
| Winter Island (RD 2122) | 925-432-3300 or 916.456.4400 |



SECTION 6. LOGISTICS AND FINANCE/ADMINISTRATION

6.1 Mutual Aid

Holland Tract is a signatory to the California Master Mutual Aid Agreement and, therefore, follows the processes outlined in those documents and the California Standardized Emergency Management System (SEMS) for requesting and providing mutual aid. Additionally, mutual aid requests for technical assistance and services, flood fight crews, supplies and materials, and other resources can be made through the EOC representative in the Operational Area Logistics Section.

6.2 Resources

The District maintains a stockpile of riprap on the island and has limited access to landowner equipment to perform levee maintenance and repairs. If equipment is not available, work will be performed on a contract basis. The following resources are available on Holland Tract. The District also has access to additional resources from RD 756 – Bouldin Island, RD 2026 – Webb Tract, and RD 2028 – Bacon Island. See Table below of flood fight supply inventory.

Table 4: Flood Fight Supply Inventory

| Description/units | Quantity on Hand |
|--|------------------|
| Visqueen Plastic, 100' x 20' x 10-mil roll | 5 |
| Sandbag, Burlap, each | 5,000 |
| Twine (250 lb.), box | 3 |
| Wooden Stakes, each | 200 |
| Tie Buttons, each | 1,400 |
| Lineman Pliers, each | 5 |
| Sledge Hammers, each | 5 |
| Shovel, each | 6 |
| Life Vests, each | 10 |
| Survey Lathe, bundle | 2 |
| Flagging Tape, red, white, pink and blue | 3 rolls of each |
| Permanent Marker, pack | 1 |
| Pad/Pencil Set, each | 1 |
| Spotlight w/extra battery, each | 1 |
| Combo Lock | 1 |
| Tool Box | 1 |

The District maintains standard forms and processes for initiating and executing contracts with private vendors. The District maintains a standard sole-source contract form for contracts under \$25,000. The District maintains a separate contract form for contracts over \$25,000, adding bonding requirements. Contracts over \$25,000 will be awarded through an informal bid process, if practicable in light of emergency conditions.



6.3 Logistics Facilities

The following map illustrates the locations of flood fight supplies and riprap. The District Engineer coordinates contracts and allocation of resources and makes decisions based on the situation at hand, in coordination with the trustees. Refer to *Annex A – Flood Contingency Map* for more information on the process for activating and establishing such supply staging areas or for mobilizing stockpiles.

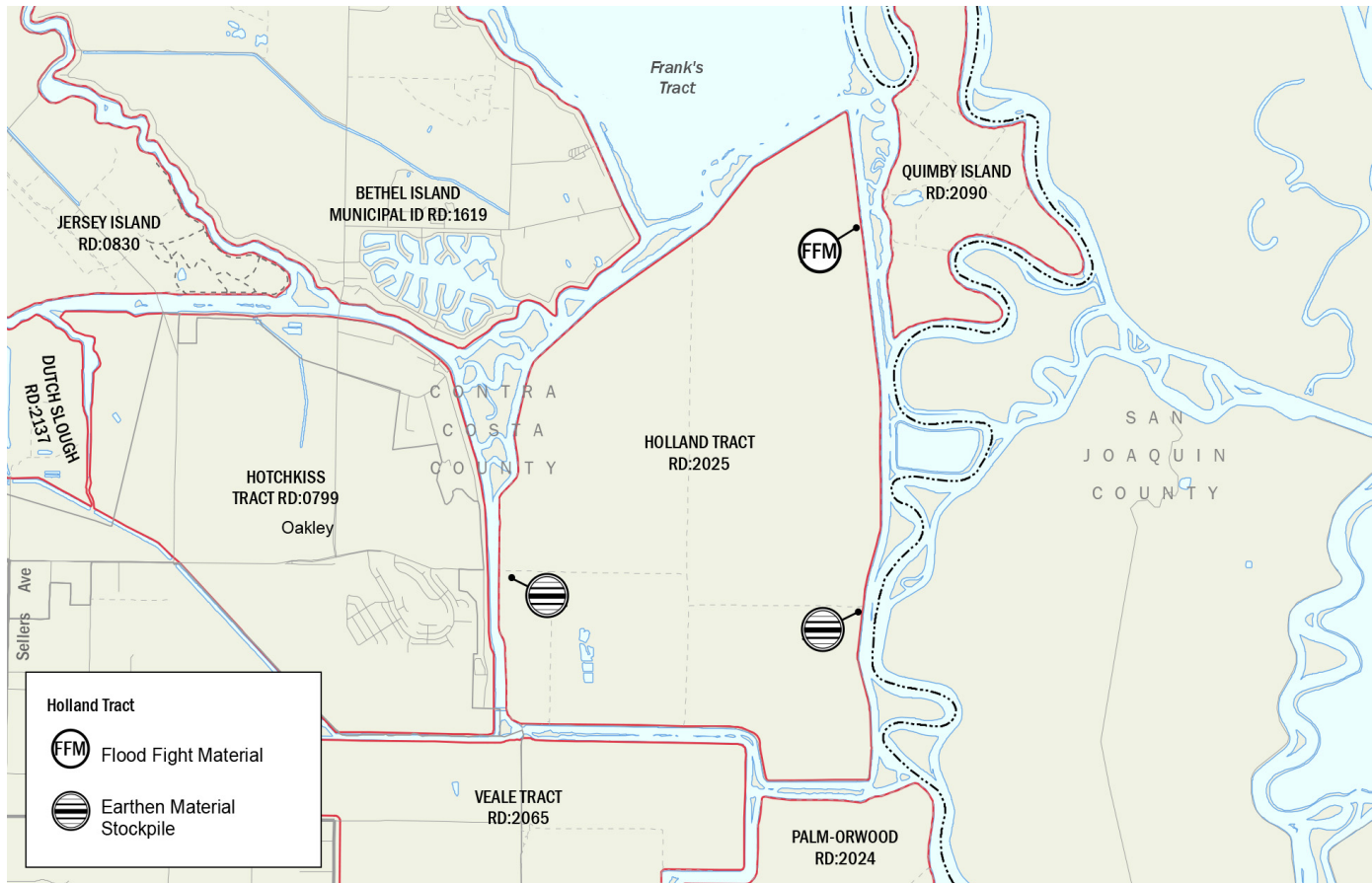


Figure 11: Pre-positioned Flood Fight Materials, Supplies, and Headquarters

6.4 Finance and Administration

The District maintains financial and administrative records associated with emergency response in accordance with 44 C.F.R. Part 13--Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments. Emergency response and construction records, including field reports and procurement and construction management files, are maintained by both the District and the District Engineer and are retained as prescribed by the grant authority.



6.5 New Building Requirements

Per California Water Code 9650, there is a requirement to the extent reasonable, that either of the following applies to a new building in which the inhabitants are expected to be essential service providers:

- (A) The building is located outside an area that may be flooded.
- (B) The building is designed to be operable shortly after the floodwater is removed.



SECTION 7. PLAN REVIEW AND MAINTENANCE

7.1 Plan Review and Maintenance

Holland Tract and individuals providing emergency response will review this plan at least annually.

In addition, this plan may be modified as a result of post-incident analyses and/or post-exercise critiques, and changes shall be published and distributed to the Contra Costa County Office of Emergency Services. This plan may also be modified whenever responsibilities, procedures, laws, rules, or regulations pertaining to emergency management and operations change.

7.2 Training and Exercises

Holland Tract staff should receive annual refresher training on the Holland Tract LFSP – Basic Plan and Annex A – Flood Contingency Map.

Holland Tract staff can also participate in internal exercises sponsored by the Contra Costa County Operational Area if requested.

7.2.1 Emergency Response and Training

The following are emergency response and training options.

7.2.1.1 Emergency Response

In an emergency, Holland Tract staff are responsible for determining a general response policy and performing financial oversight. They are responsible for organizing response activities, supervising any hired staff or contractors, and coordinating with outside agencies.

Training should be tailored to the level of incident complexity that these staff would potentially manage.

7.2.1.2 Training Requirements

The following training requirements should be considered for Holland Tract staff involved in flood emergency operations:

Prior to beginning work, staff hired or transferred to serve as Emergency Levee Workers at the time of an emergency should receive the 2-hour ICS-100 and ICS-200 courses and specific procedures and safety information for their emergency duties.

7.3 Plan Evaluation

The District Engineer should coordinate and facilitate post-incident analyses following emergencies and exercises. An After-Action Report and Implementation Plan should be prepared to capture lessons learned and plan improvements.



INTENTIONAL BLANK PAGE



SECTION 8. AUTHORITIES AND REFERENCES

The following sources provide authorities for planning, conducting, and/or supporting flood emergency operations.

8.1 Federal

- Federal Civil Defense Act of 1950 (Public Law 920, as amended)
- Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Public Law 93-288, as amended)
- U.S. Army Corps of Engineers Disaster Operations (Public Law 84-99)

8.2 State

- California Emergency Services Act (Chapter 7, Division 1 of Title 2 of the Government Code)
- Standardized Emergency Management System Regulations (Chapter 1 of Division 2 of Title 19 of the California Code of Regulations)
- California Department of Water Resources Flood Control (California Water Code §128)
- Hazardous Materials Area Plan Regulations (Chapter 4 of Division 2, Title 19, Article 3, §2720-2728 of the California Code of Regulations) and California Health and Safety Code, Division 20, Chapter 6.95, Section 25503.5

8.3 Local

- Holland Tract Local Flood Safety Plan
- Contra Costa County Emergency Operations Plan



INTENTIONAL BLANK PAGE



SECTION 9. GLOSSARY OF TERMS/ACRONYMS

| | |
|-------------|---|
| CDA | California Disaster Assistance Act |
| CDEC | California Data Exchange Center |
| CEQA | California Environmental Quality Act |
| DWR | Department of Water Resources |
| EOC | Emergency Operations Center |
| FEMA | Federal Emergency Management Agency |
| FOC | Flood Operations Center |
| ICP | Incident Command Post |
| JIC | Joint Information Center |
| LFSP | Local Flood Safety Plan |
| LMA | Levee Maintaining Agency |
| MACS | Multi-agency coordination system |
| NOAA | National Oceanic and Atmospheric Administration |
| OES | Office of Emergency Services |
| PED | Preliminary Engineering Design |
| RD | Reclamation District |
| REOC | Regional Emergency Operations Center |
| SEMS | Standardized Emergency Management System |
| USGS | United States Geological Survey |



INTENTIONAL BLANK PAGE



APPENDIX A. FLOOD CONTINGENCY MAP

Flood fight operations, including levee patrols, will be conducted in accordance with the procedures shown below and those shown on Annex A – Flood Contingency Map.



INTENTIONAL BLANK PAGE



APPENDIX B. INCREASED READINESS CHECKLIST

This Increased Readiness Checklist applies to a developing situation in which the levees are not in danger of failing. In many cases, these unusual events are remedied, with no further action required. Residents may need to be notified if flooding threatens life or property, but it should be made clear that the levees are safe.

| TASK/ACTION | | COMMENT | STATUS Assigned/Completed |
|-------------------------------|--|---------|---|
| Increased Readiness Checklist | | | |
| 1 | Upon notification of potential emergency/disaster, adopt an increased readiness posture by LFSP, maps, and mutual aid agreements (if applicable) | | <input type="checkbox"/> Assigned <input type="checkbox"/> Completed <input type="checkbox"/> N/A |
| 2 | Consider alerting/recalling off-shift Holland Tract staff/volunteers | | <input type="checkbox"/> Assigned <input type="checkbox"/> Completed <input type="checkbox"/> N/A |
| 3 | Assess the availability and condition of resources | | <input type="checkbox"/> Assigned <input type="checkbox"/> Completed <input type="checkbox"/> N/A |
| 4 | Anticipate logistical needs (potential resupply needs, etc.) | | <input type="checkbox"/> Assigned <input type="checkbox"/> Completed <input type="checkbox"/> N/A |
| 5 | Anticipate specialized equipment needs and inspect operational status (backhoes, crawler tractors, self-priming pumps, etc.) | | <input type="checkbox"/> Assigned <input type="checkbox"/> Completed <input type="checkbox"/> N/A |
| 6 | Provide status report to County OES | | <input type="checkbox"/> Assigned <input type="checkbox"/> Completed <input type="checkbox"/> N/A |
| 7 | Stage equipment and material in strategic locations as deemed necessary | | <input type="checkbox"/> Assigned <input type="checkbox"/> Completed <input type="checkbox"/> N/A |



INTENTIONAL BLANK PAGE



APPENDIX C. FLOOD WATER REMOVAL (DEWATERING) OPTIONS

With the overtopping or failure of a levee flood protection system, the lands protected by the levee system may become partially or fully inundated. Depending on the situation, the area may need to be dewatered immediately to prevent further flooding or to protect the overall integrity of the flood protection system, or the water may need to be removed to return the area to pre-flood conditions. Flood water removal is an integral part of flood emergency response and needs to be considered in planning for floods. Flood water removal projects are generally exempt from the California Environmental Quality Act (CEQA). Statutory exemptions include “emergency projects such as actions required to restore damaged facilities or mitigate an emergency.” The following describes flood water removal options to dewater areas protected by a levee system.

OPTION 1 – NO IMMEDIATE DEWATERING NEEDED

Based on the situation, it may be advisable to take no immediate action. For example, an inundated agricultural area creating no threat to life and property may be left flooded until waters recede naturally. Due to public perception and expectations, this may be a difficult decision to reach, albeit logical. For some areas, this choice can be made in advance of a flood event.

OPTION 2 – CLOSE BREACH BUT DO NOT REMOVE WATER

Closing the opening in a failed levee is generally the first step of any levee breach repair. It may be necessary to wait for the inflow to slow before taking this action. Rock and suitable materials must be available to armor the ends of the break before closing the opening with additional suitable material. After the breach is closed, it may be cost-effective to simply let the ground dry out on its own, depending on the extent of the flooding.

OPTION 3 – REPAIR BREACH AND REMOVE WATER BY PUMPING

After a breach is closed, water can be removed using available on-site or perhaps portable pumps. For large flooded areas, the time and expense for this work can be extensive. Providing information on pump suppliers, possible locations for pumps, and other logistics before the event should be part of the plan. The District may choose to pump floodwater back into the nearby channels, provided the action does not increase the chance of flooding on adjacent islands.



INTENTIONAL BLANK PAGE



APPENDIX D. ACTION AND EVENT PROGRESSION LOG

CONFIDENTIAL INFORMATION – DESTROY BEFORE DISCARDING

| Date | Time | Action/Event Progression | Taken by |
|------|------|--------------------------|----------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Report prepared by: _____ Date: _____

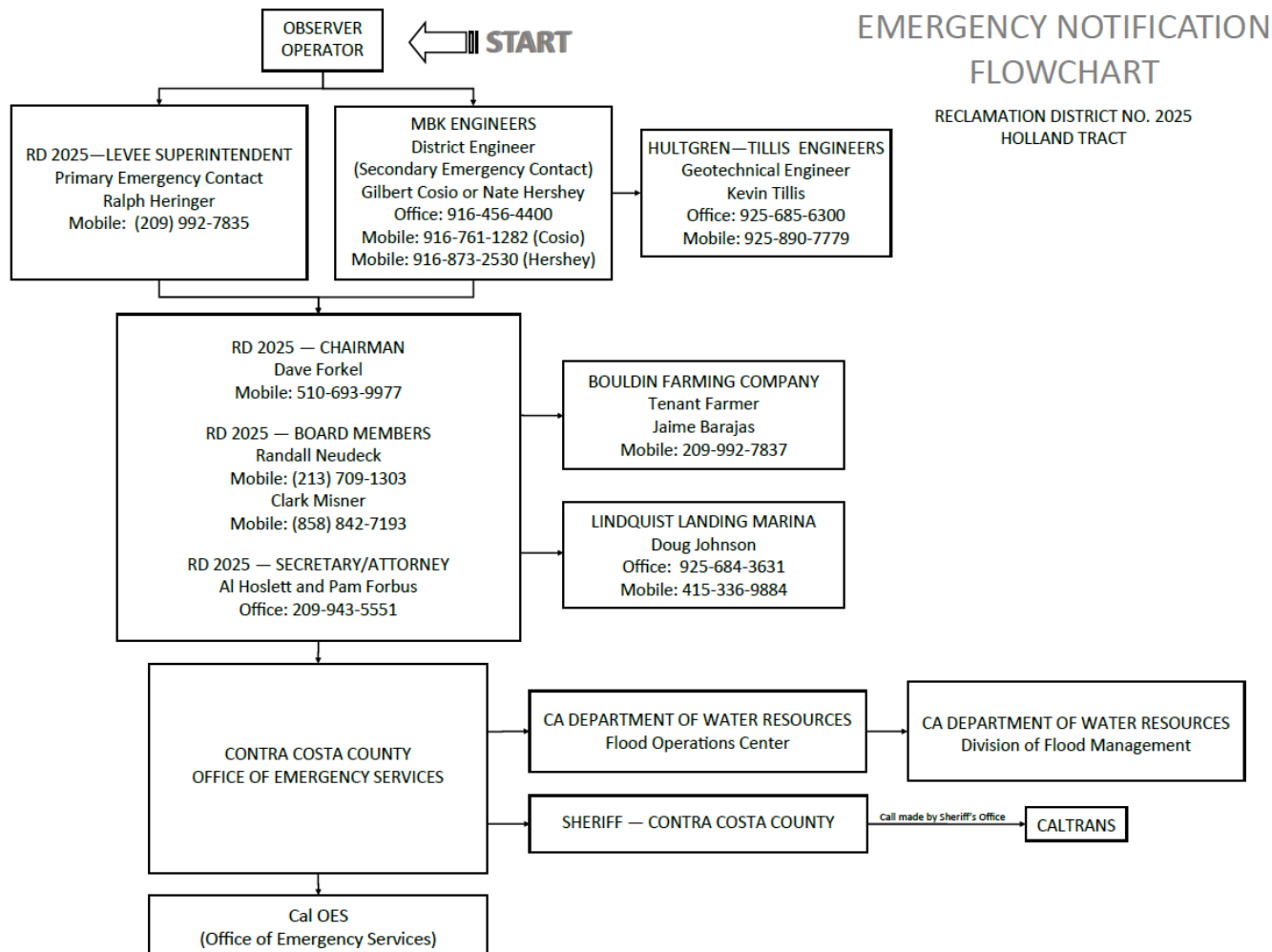


INTENTIONAL BLANK PAGE



APPENDIX E. EMERGENCY PERSONNEL CONTACTS

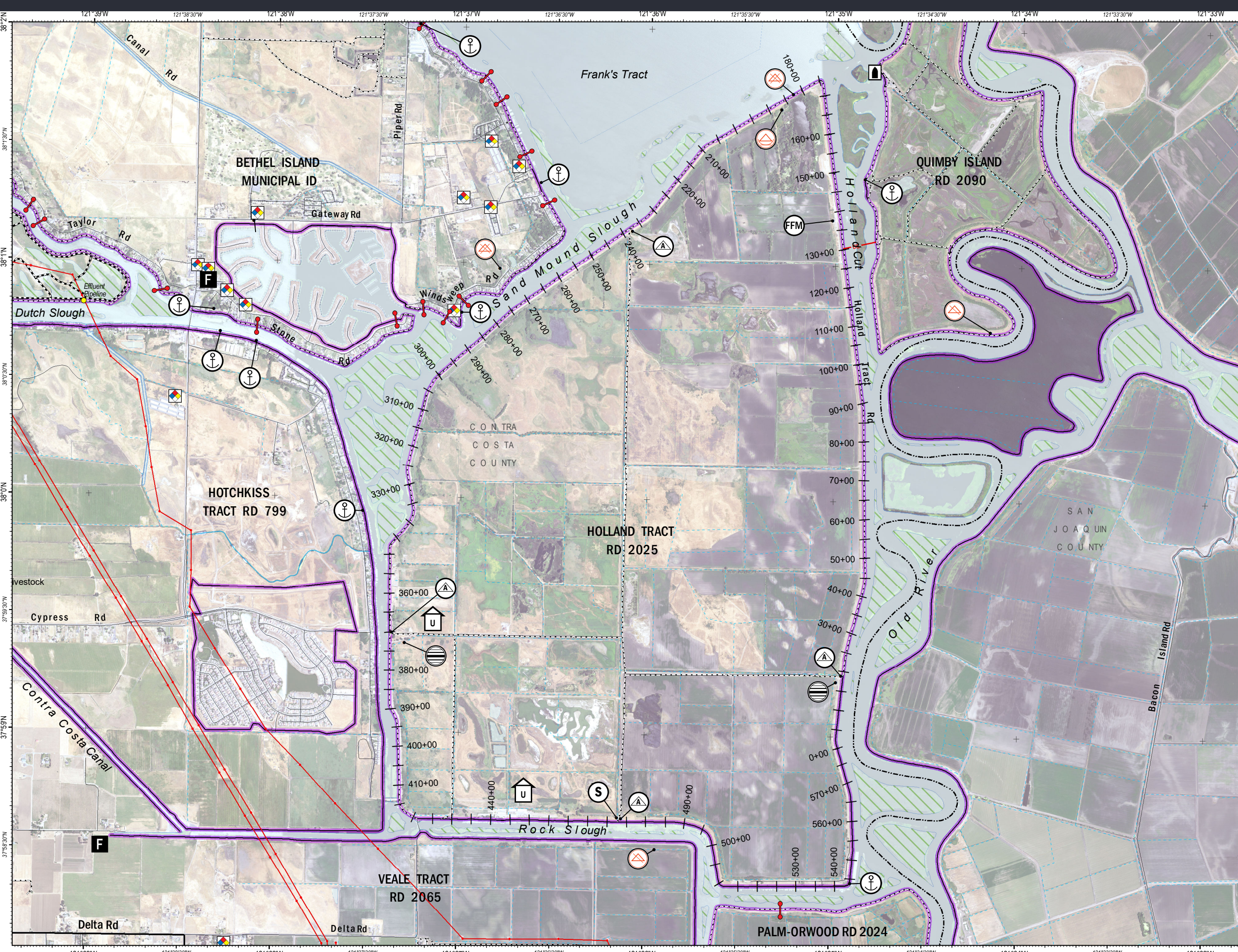
The following emergency personnel will be contacted for a developing situation in which the levees are not in immediate danger of failing. If a failure is imminent, call 9-1-1.



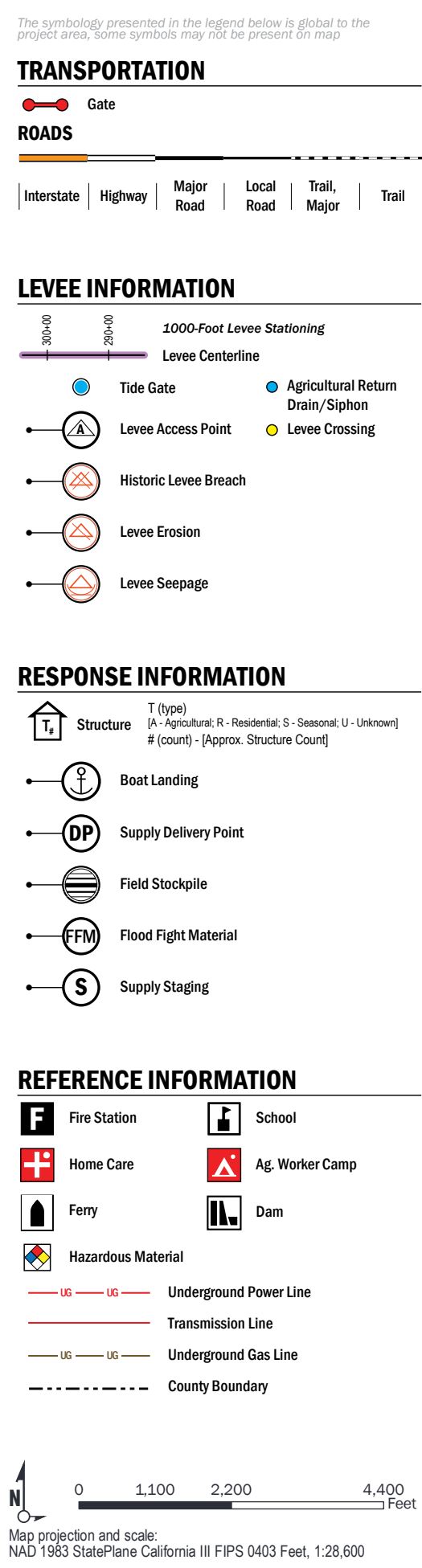


INTENTIONAL BLANK PAGE

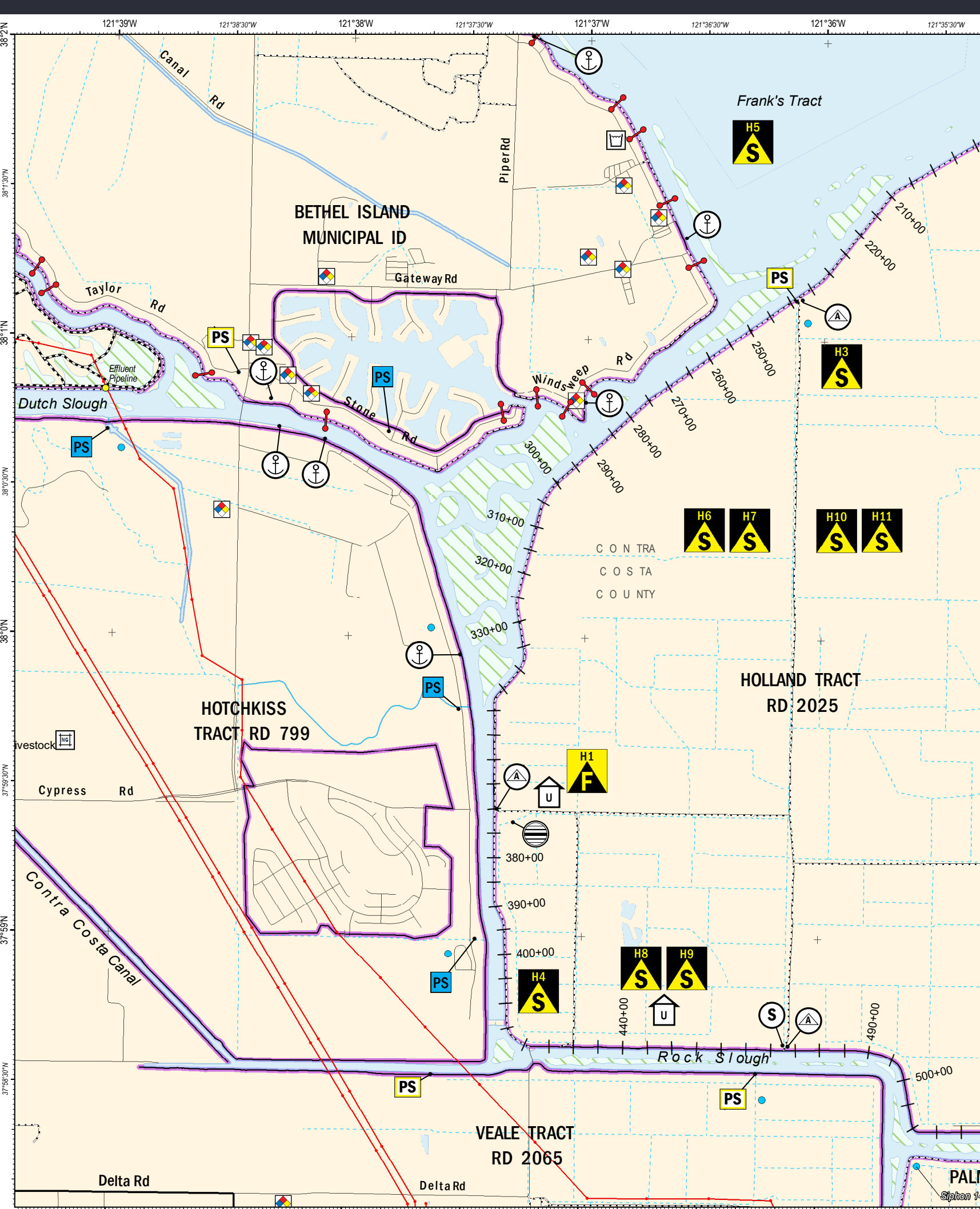
PUBLIC SAFETY



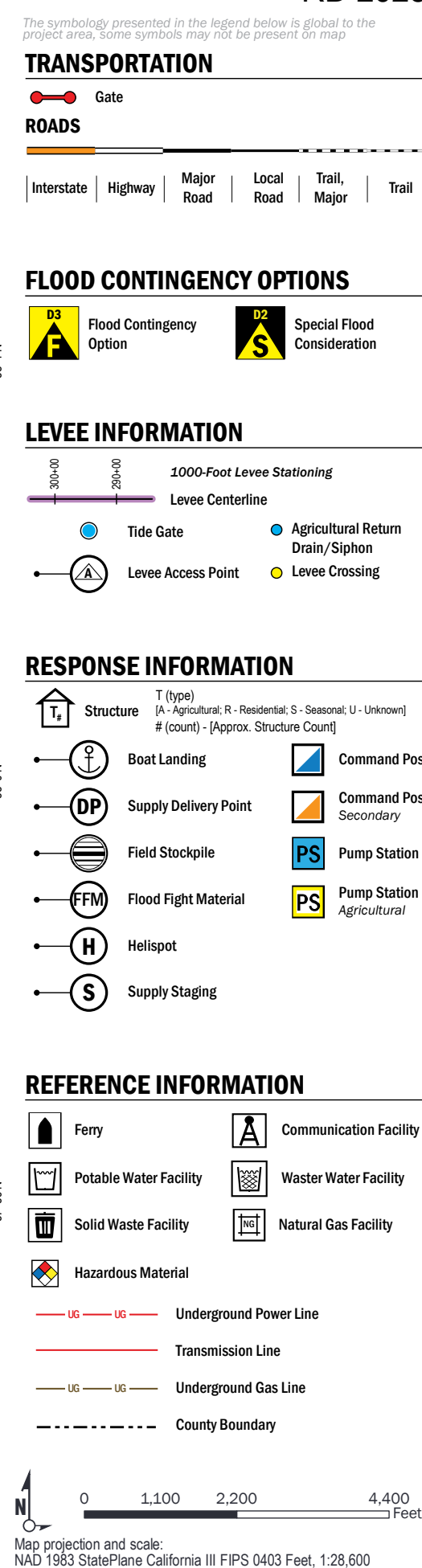
Holland Tract RD 2025



FLOOD CONTINGENCY



Holland Tract RD 2025



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

FLOOD FIGHT STAGING

The staging area will be located at the south end of Center Road near station 472+00
37°58'38.69887440"N, 121°36'08.57300040"W

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

No Known Supply Delivery Points in Map Extent

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

RIP RAP STOCKPILE

Rock stockpile stored on island for immediate use in flood fight.
37°59'13.85517480"N, 121°34'58.53153000"W

RIP RAP STOCKPILE

Rock stockpile stored on island for immediate use in flood fight.
37°59'22.88067600"N, 121°37'17.56632360"W

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

FLOOD FIGHT MATERIALS

Inventory meets DWR requirements: Visqueen, sandbags, twine, stakes, tie buttons, pliers, sledge hammers, shovels, life vests, survey lathe, flagging tape, markers, pencils and pads, spotlight, tool box and lock.
38°01'11.73842400"N, 121°35'01.07962440"W

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

No Known HazMat Locations in Map Extent

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

| | |
|--|--|
| CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT Evacuation 925.335.1500, Information 925.646.2441, Emergency | CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT Evacuation/Rescue 925.941.3330 |
| CONTRA COSTA COUNTY OFFICE OF EMERGENCY SERVICES CCC OES 925.228.5000, 24-HOUR | CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT Debris Management 925.427.8562 |

COUNTY ICS/EOC OPS

| | | |
|---|---|--|
| CONTRA COSTA COUNTY 925.646.4461, Office 925.228.5000, 24-Hour | SAN JOAQUIN COUNTY 209.953.6200, Office 209.468.4400 Emergency | YOLO COUNTY 530.406.4930, Office 530.666.8920 24-Hour |
|---|---|--|

| | |
|--|---|
| SACRAMENTO COUNTY 916.874.4670, Office 916.875.5000, Night 916.875.6900, Night | SOLANO COUNTY 707.784.1600, Office 707.421.7090, Night |
|--|---|

RESPONSE SUPPORT

| | | | |
|---|--|--|---|
| AMERICAN RED CROSS Sheltering 800.783.7867 | DWR STATE-FEDERAL FLOOD OPERATIONS CENTER Coordination for Support 916.574.2619 | CALTRANS Evacuation/Bridge Support 916.554.2852 | CALIFORNIA CONSERVATION CORPS Environmental/Disaster Response 916.341.3100 |
|---|--|--|---|

LMA CONTACTS

| | | | |
|--|---|--|--|
| BIXLER TRACT (RD 2121) Tom Bloomfield 925.590.5540 | BYRON TRACT (RD 800) Jeff Conway 925.584.8542 Bus. | HOTCHKISS TRACT (RD 799) Dina Holder 925.684.2938 | QUIMBY ISLAND (RD 2090) Al Warren Hoslett 209.943.5551, Bus. |
| BIMID Regina Espinosa 925.684.2210 Lawrence Martins 925.383.8310 | CONEY ISLAND (RD 2117) Dante Nomellini 209.465.5883, Bus. 809.969.7755, Bus. Cell | JERSEY ISLAND (RD 830) Chad Davidson 925.625.2279 ER Contact 925.727.2938 | VEALE TRACT (RD 2065) Dante Nomellini 209.465.5883, Bus. 809.969.7755, Bus. Cell |
| BRADFORD ISLAND (RD 2059) Dominick Gulli 209.476.6925 Bus. 209.649.4555, Bus. Cell | PALM-ORWOOD TRACT (RD 2024) Nate Hersey 916.458.4400 | WEBB TRACT (RD 2026) Al Warren Hoslett 209.943.5551, Bus. | WINTER ISLAND (RD 2122) Robert Calone 925.432.3300 |
| | HOLLAND TRACT (RD 2025) David A. Forkel 925.932.0251 925.689.9977 | | |

A.1. SPECIAL FLOOD CONSIDERATIONS

H1 - PUMP STATION 1

Located near station 19+00. Discharge pump may be used during a major flood event; however, additional pumps will be required to dewater the island.

H2 - PUMP STATION 2

Located near station 73+00. Discharge pump may be used during a major flood event; however, additional pumps will be required to dewater the island.

H3 - PUMP STATION 3

Located near station 239+00. Discharge pump may be used during a major flood event; however, additional pumps will be required to dewater the island.

H4 - HOLLAND TRACT BRIDGE

Holland Tract Bridge is the only motor vehicle egress for Holland Tract. A secondary bridge is located in the general vicinity of Sandmound Blvd. Contact the local Reclamation District to gain access to Sandmound Blvd in the event of an emergency.

H5 - FRANKS TRACK OPEN WATER

The flooding threat is predominantly tidal, with some local runoff that can influence conditions. The Old River (on the east side of the island) could pose a riverine flooding threat. Franks Tract (large expanse of open water) can create erosion due to wind/waves.

H6 - WAVE FETCH

The wave fetch is relatively short on the southern, eastern, and western portions of the island and is generally not a concern over much of the District. The northern portion of the island has a wave fetch of up to 3.5 miles across Franks Tract. Channel widths generally vary from 150 to 1,450 feet. The levees are armored with riprap, except some areas along the southern and eastern levees.

H7 - LEEVE STATUS

There is no levee certification status for Holland Tract. The levee geometry generally meets the PL-84-99 Delta Specific Standard.

H8 - TRACT INHABITANTS

Two active marinas are located along the south levee (Lindquist Landing and Holland Riverside Marina), with up to 40 inhabitants living boats at any given time.

H9 - LEEVE ACCESS

County-maintained road is located on the crown of the south levee and portions of the east levee.

H10 - LAND USES

Portions of the island are farmed or leased for grazing, with operations supported by various facilities and equipment. The island also has permanent habitat sites.

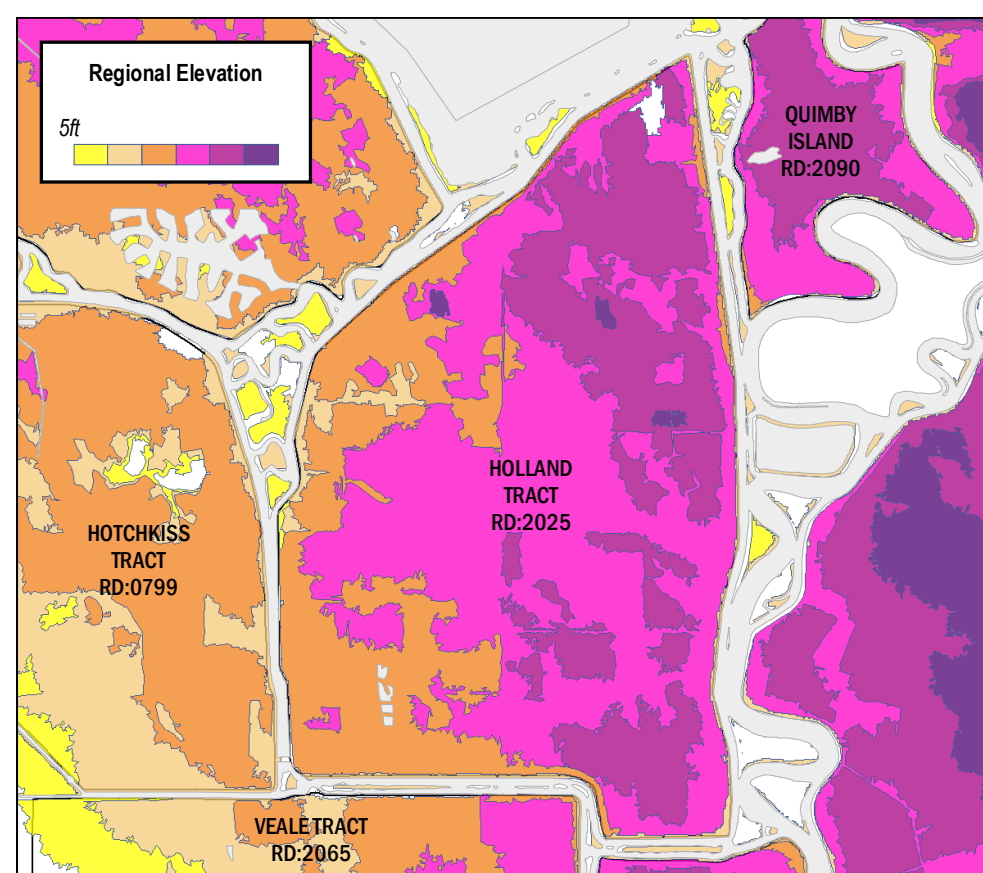
H11 - PUMP STATION INFRASTRUCTURE

Infrastructure includes pumping stations for drainage and associated electrical lines.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

H1 - HIGH WATER EVENT

Multiple high water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Vulnerable area approx. 2,000 feet. Muscled wall or temporary earthen levee is recommended.

H2 - WAVE WASH

Wind waves could occur at this location. Wind waves could cause erosion to levee failure if not addressed for long periods of time; protection area approx. 1,000 feet.

H3 - BOIL FROM SEEPAGE THROUGH LEEVE

Boil events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Not associated with wind generated waves and erosion. Response to boils requires sack ring, or boll ring, to control water flow and pressure through levee to minimize transport of fine material through seepage that has uncontrolled flow of water and transport of levee material. Tides and low pressure can play a part in both wind and seepage impact potential.

H4 - FLOOD FIGHT MATERIALS

The District maintains stockpiles of riprap on the island and has equipment available to perform levee maintenance and repairs.

H5 - FLOOD FIGHT MATERIALS

Deploy flood fight materials to prevent levee degradation and activate workforce for levee patrols.

H6 - FLOOD FIGHT MATERIALS

Prepare resources for temporary earthen levee or muscled wall.

H7 - FLOOD FIGHT MATERIALS

Muscled Wall Material Required: 2000 feet of temporary earthen levee (24 high x 4ft wide) will require approximately 40 rolls of 10 mil plastic sheeting, 600 sandbags, and 80 cubic yards of fill. Approximately 11.1 cubic yards of fill for sand bags and 78.5 cubic yards of fill for riprap fill.

H8 - FLOOD FIGHT MATERIALS

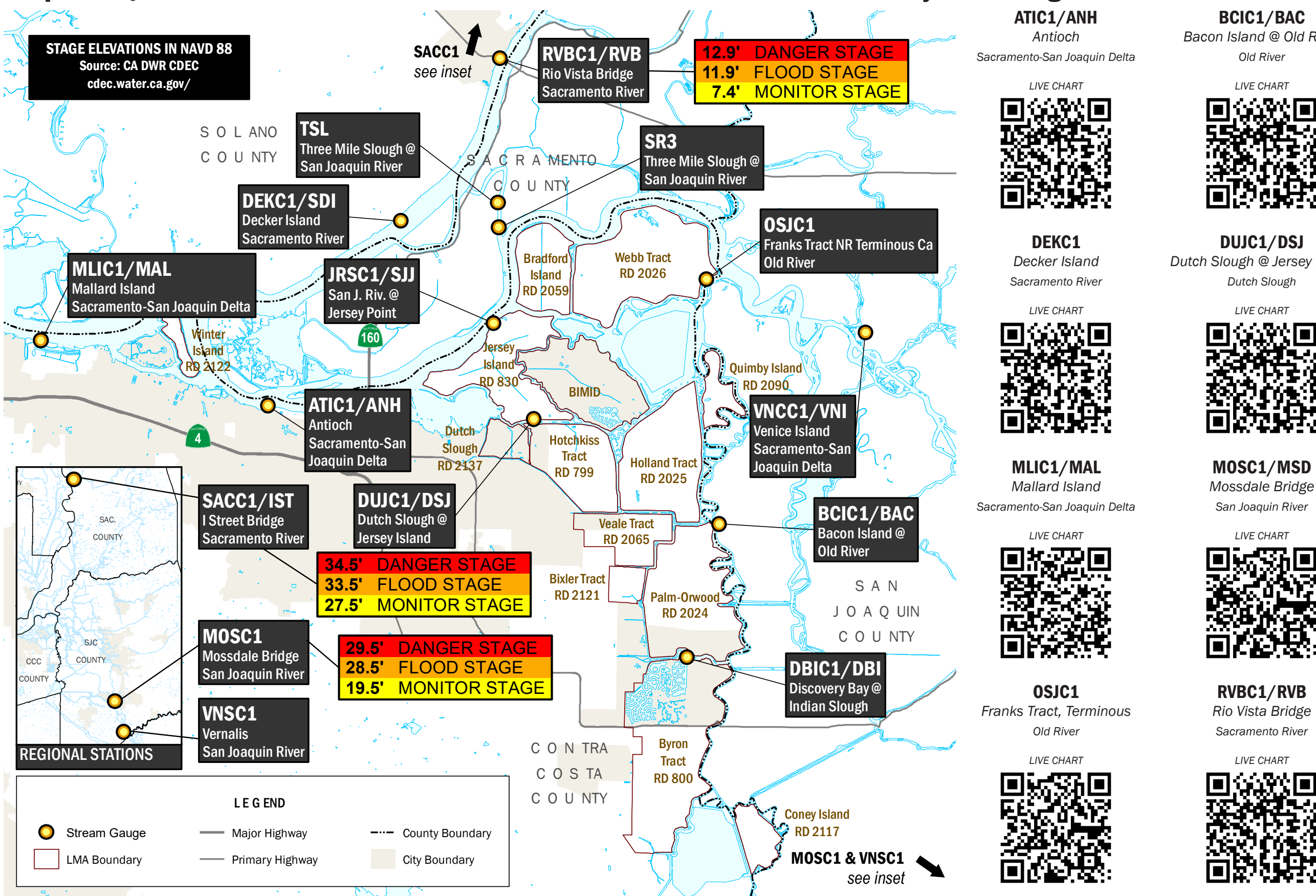
Temporary Earthen Levee Material Required: 2000 feet of temporary earthen levee (24 high x 4ft wide) will require approximately 40 rolls of 10 mil plastic sheeting, 600 sandbags, and 80 cubic yards of fill. Approximately 11.1 cubic yards of fill for sand bags and 78.5 cubic yards of fill for riprap fill.

H9 - FLOOD FIGHT MATERIALS

Protect and isolate seepage area with boll sack ring.

Regional Stream Monitor Stations

Map and QR Code Links to Live Monitor Stations in the Contra Costa County Delta Region

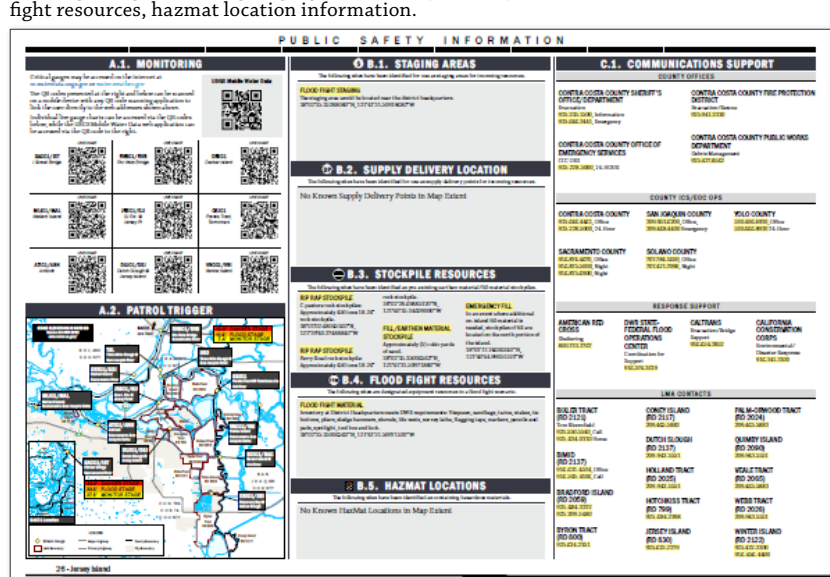


Contra Costa County Levee Maintaining Agencies

Key To Companion Mapbook Design & Pages

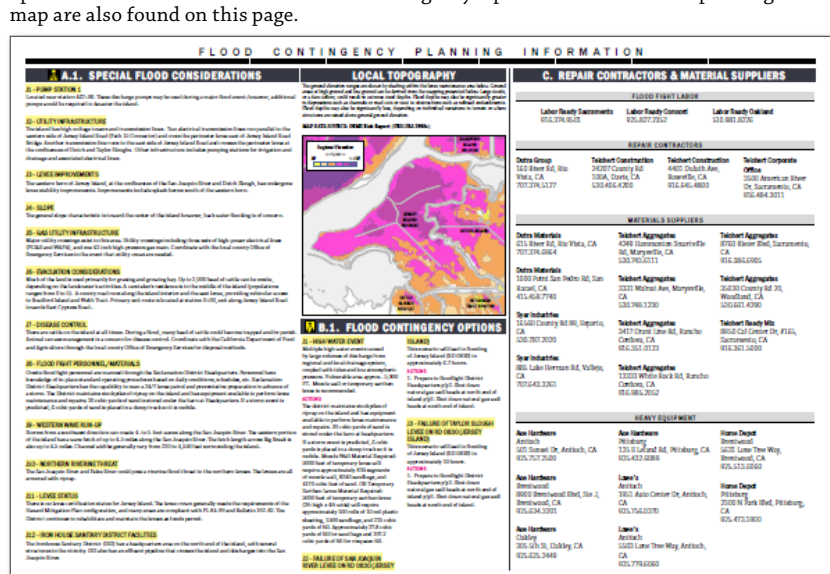
PUBLIC SAFETY SPREAD

Presents links to live stream level monitoring information along with communications support information. Provides additional information about features found on corresponding map (right page) including staging areas, supply delivery locations, stockpile resources, flood fight resources, hazard locations information.



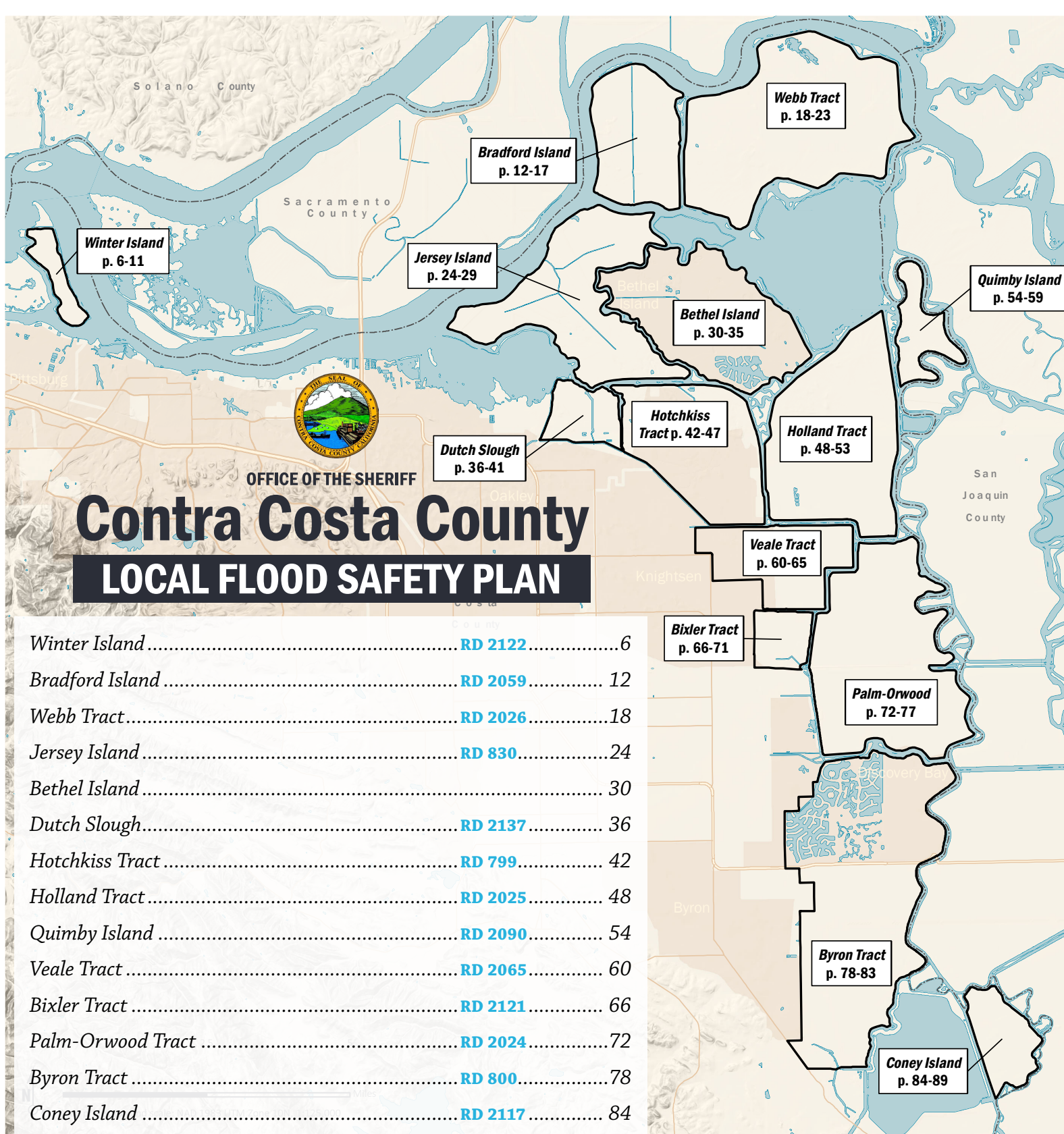
FLOOD CONTINGENCY PLANNING INFORMATION SPREAD

Presents the general topography of the LMA along with repair contractor and material supplier information. Provides additional information about features found on corresponding map (right page) including staging areas, supply delivery locations, stockpile resources, flood fight resources, hazard locations information.



CONSULTANT TEAM

Michael Baker International, Project Manager
Kenneth Zalkowicz, Lead Flood Safety Plan Author
Dana Healy, Dynamic Planning + Science, GIS & Planning Manager
Brian Geer, Dynamic Planning + Science, Lead Cartographer



HOLLAND TRACT



OFFICE OF THE SHERIFF

Contra Costa County

LOCAL FLOOD SAFETY PLAN

Levee Maintaining Agency Mapbook

PREPARED BY

Michael Baker

INTERNATIONAL





OFFICE OF THE SHERIFF

Contra Costa County

LOCAL FLOOD SAFETY PLAN

Levee Maintaining Agency Mapbook

PREPARED BY

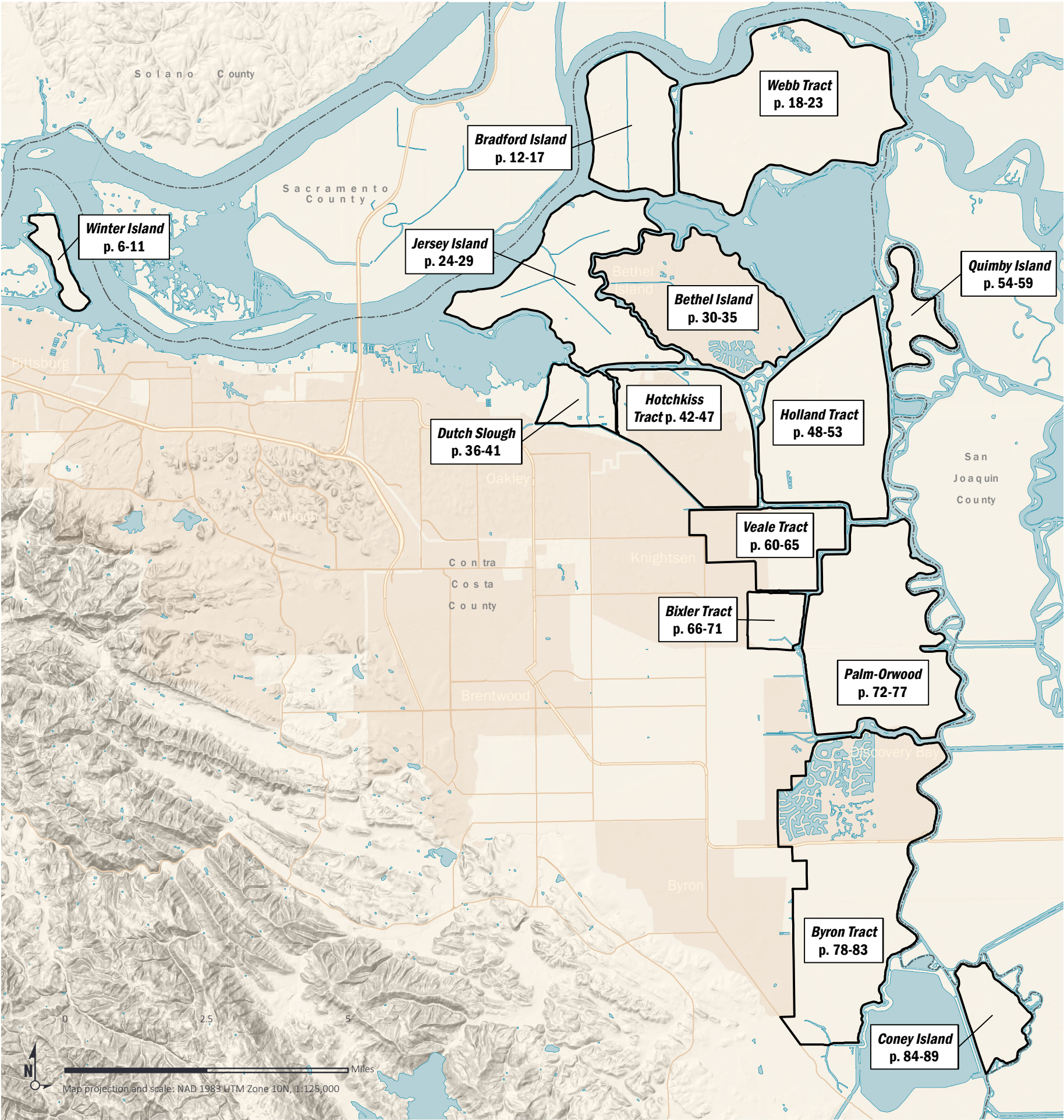
Michael Baker
INTERNATIONAL



PAGE INTENTIONALLY BLANK

TABLE OF CONTENTS

| Section | RD Number | Page |
|---|-----------------|------|
| <hr/> | | |
| Mapbook Information | | 4 |
| Regional Information | | 5 |
| Winter Island | RD 2122 | 6 |
| Bradford Island | RD 2059 | 12 |
| Webb Tract | RD 2026 | 18 |
| Jersey Island | RD 830 | 24 |
| Bethel Island | | 30 |
| Dutch Slough | RD 2137 | 36 |
| Hotchkiss Tract | RD 799 | 42 |
| Holland Tract | RD 2025 | 48 |
| Quimby Island | RD 2090 | 54 |
| Veale Tract | RD 2065 | 60 |
| Bixler Tract | RD 2121 | 66 |
| Palm-Orwood Tract | RD 2024 | 72 |
| Byron Tract | RD 800 | 78 |
| Coney Island | RD 2117 | 84 |
| Flood Fight Information | | 90 |
| Flood Fight Information Materials Calculators | | 92 |



Mapbook Information

PROJECT DESCRIPTION

In 2014, the California Department of Water Resources (DWR) funded flood preparedness grants in the Central Valley to enable local emergency responders to work with Levee Maintaining Agencies / Reclamation Districts (LMAs/RDs) to improve local flood emergency preparedness/response and satisfy requirements of the Central Valley Flood Protection Act of 2008 and California Water Code Section 9650 (AB156).

Contra Costa County was one recipient of the DWR grant funding. The project team will coordinate with LMAs/RDs in the Contra Costa County portion of the Sacramento-San Joaquin River Delta, and with neighboring cities and the County to develop the following:

AB156 compliant Local Flood Safety Plans to include state-of-the-art flood contingency maps.

A hazard-specific flood annex to the Contra Costa County Emergency Operations Plan to improve County and city flood response protocols and evacuation plans to include the development of evacuation maps where suitable.

Public awareness brochure development and distribution (focused on Bethel Island Municipal Improvement District).

DATA ACCURACY

Effective communication, interoperability and response to large incidents require real-time collaboration among multiple agencies. Spatial data interoperability is a critical component to effective emergency response management when responding to flood events. This mapbook and the Local Flood Safety Plan Spatial Data Model are intended for use by local, state and federal personnel while in the field and in emergency operation centers. Elements of the data model include data for Critical Infrastructure, Emergency Management, Flood Control, and base map information.

Contra Costa County, Michael Baker International, and Dynamic Planning + Science have compiled the information in this mapbook with care using the best available data at the time of publication.

The Special Flood Consideration and Flood Contingency Option (SFC/FCO) information, including spatial database information that contributed to the SFC/FCO layer, has been prepared, in part, based upon information provided by others.

Contra Costa County, Michael Baker International, and Dynamic Planning + Science assume no responsibility for the accuracy of this document or for any errors or omissions that may have been incorporated into it as a result of incorrect information provided by others. Those relying on this document are advised to obtain independent verification of its accuracy. Contra Costa County, Michael Baker International, and Dynamic Planning + Science are not responsible for property damage or loss of life as a result of recommended actions documented in this mapbook.

SYMBOLLOGY

Extensive efforts have been made to ensure that the symbology used in this mapbook meet the regional standards for flood contingency mapping in the California Delta region. The symbology presented with the cartography of this mapbook is focused on simple recognition and intuitiveness. Using this approach, symbol shape, color and contrast are used to create symbology patterns that differentiate categories of emergency management map features. These symbology patterns allow the maps to be interpreted quickly. A full symbol legend accompanies each map spread. Note that the legend is not abbreviated based on the map but is presented in its entirety on each map regardless of whether the map contains a particular symbol.

DESIGN OF THE MAPBOOK

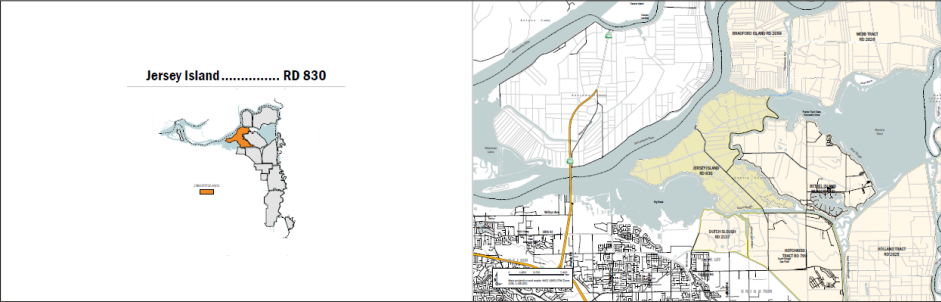
This mapbook includes maps covering Contra Costa County’s 14 Levee Maintaining Agencies (LMA). The scale of each map varies, and the area covered on each map includes a focus area consisting of an individual LMA and individual Evacuation Zones as necessary.

The mapbook is divided into fourteen sections by LMA – each consisting of three spreads as detailed below. Unlike a traditional atlas, in this mapbook there is overlap in the geography covered from page to page.

This mapbook can be used for planning purposes, and for communication between emergency operation centers to field personnel conducting flood fights.

SPREAD 1 - REGIONAL LOCATOR

LMA section separator and project area and regional location context.



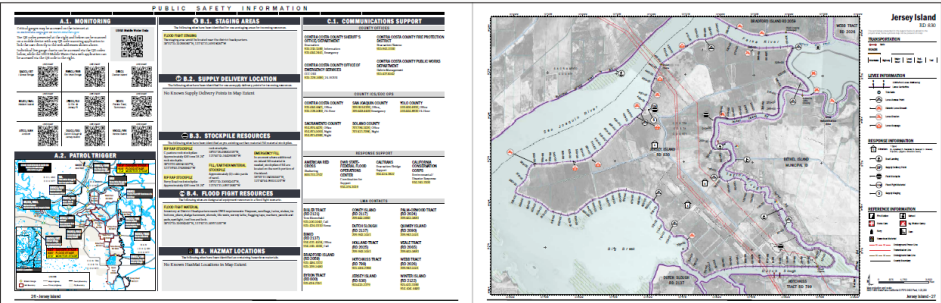
SPREAD 2 - PUBLIC SAFETY

LEFT PAGE

Presents links to live stream level monitoring information along with communications support information. Provides additional information about features found on corresponding map (right page) including staging areas, supply delivery locations, stockpile resources, flood fight resources, hazmat location information.

RIGHT PAGE

Map of public safety information for the LMA including general road basemap, levee locations and measured levee stationing, and response information. General evacuation routes and rally points are provided for populated LMA's.



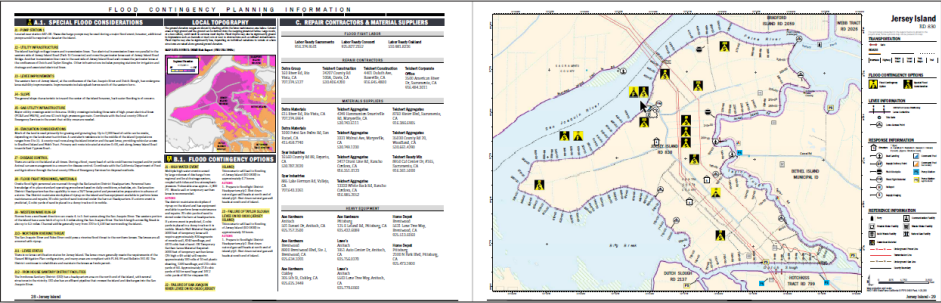
SPREAD 3 - FLOOD CONTINGENCY PLANNING INFORMATION

LEFT PAGE

Presents the general topography the LMA along with repair contractor and material supplier information. Special Flood Consideration and Flood Contingency Option narratives corresponding to the map are also found on this page.

RIGHT PAGE

Map of Special Flood Considerations and Flood Contingency options in addition to general road basemap, levee locations and measured levee stationing, and flood response information including - structure types and approximate occupancies, boat landings, stockpiles, flood fight materials, helispots, staging locations, ICP's and pump stations.



PROJECT TEAM



CONTRA COSTA COUNTY SHERIFF

Rick Kovar
Contra Costa County -
Office of the Sheriff
OES Manager

Marcelle Indelicato
Contra Costa County -
Office of the Sheriff
Senior Emergency Planner

CONSULTANT TEAM

Michael Baker
INTERNATIONAL

MICHAEL BAKER INTERNATIONAL

Michael Skowronek
Michael Baker International
Project Manager

Kenneth Zaklukiewicz
Michael Baker International
Local Flood Safety Plan Author

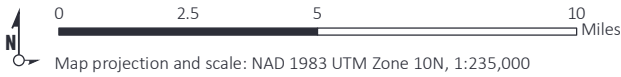
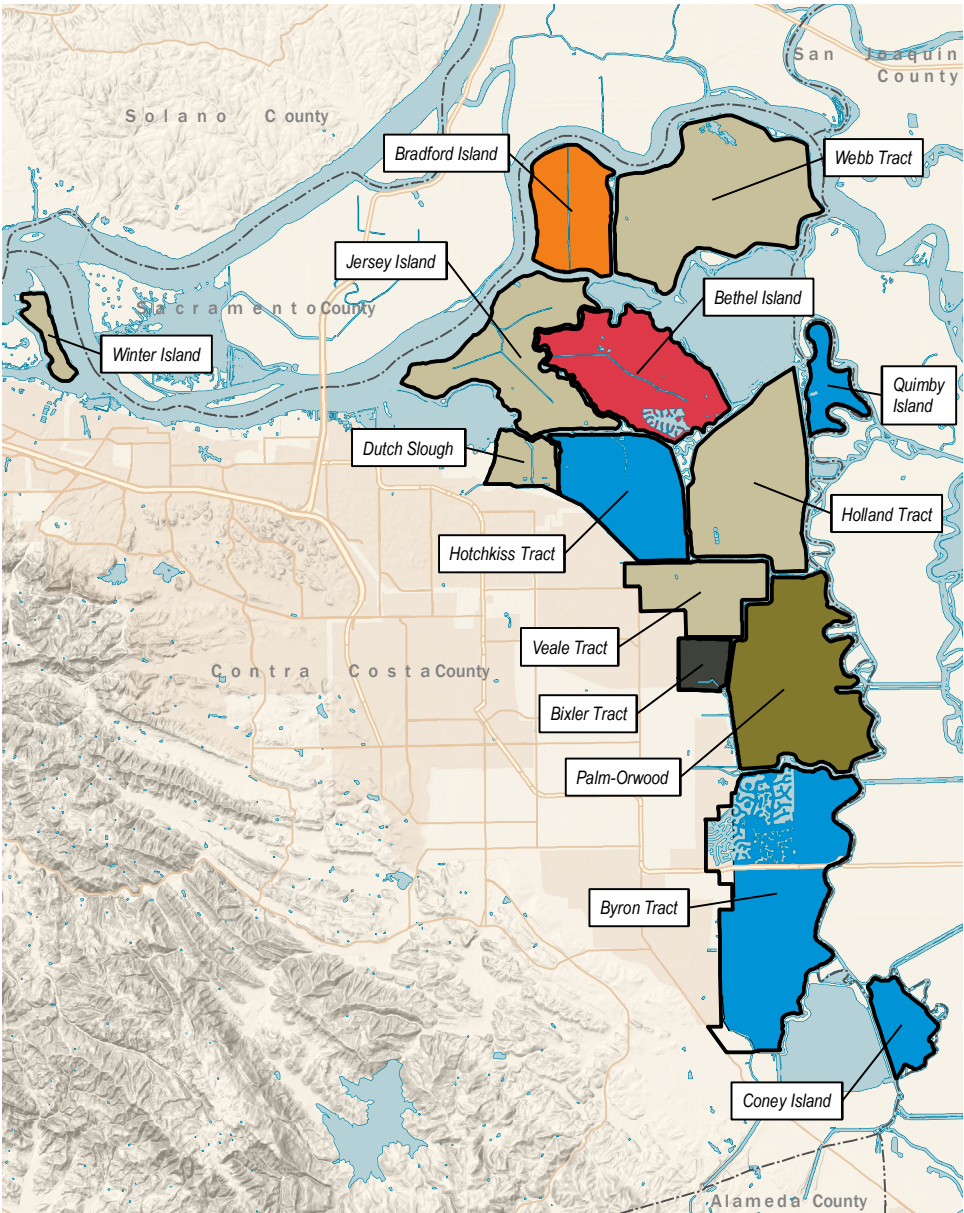
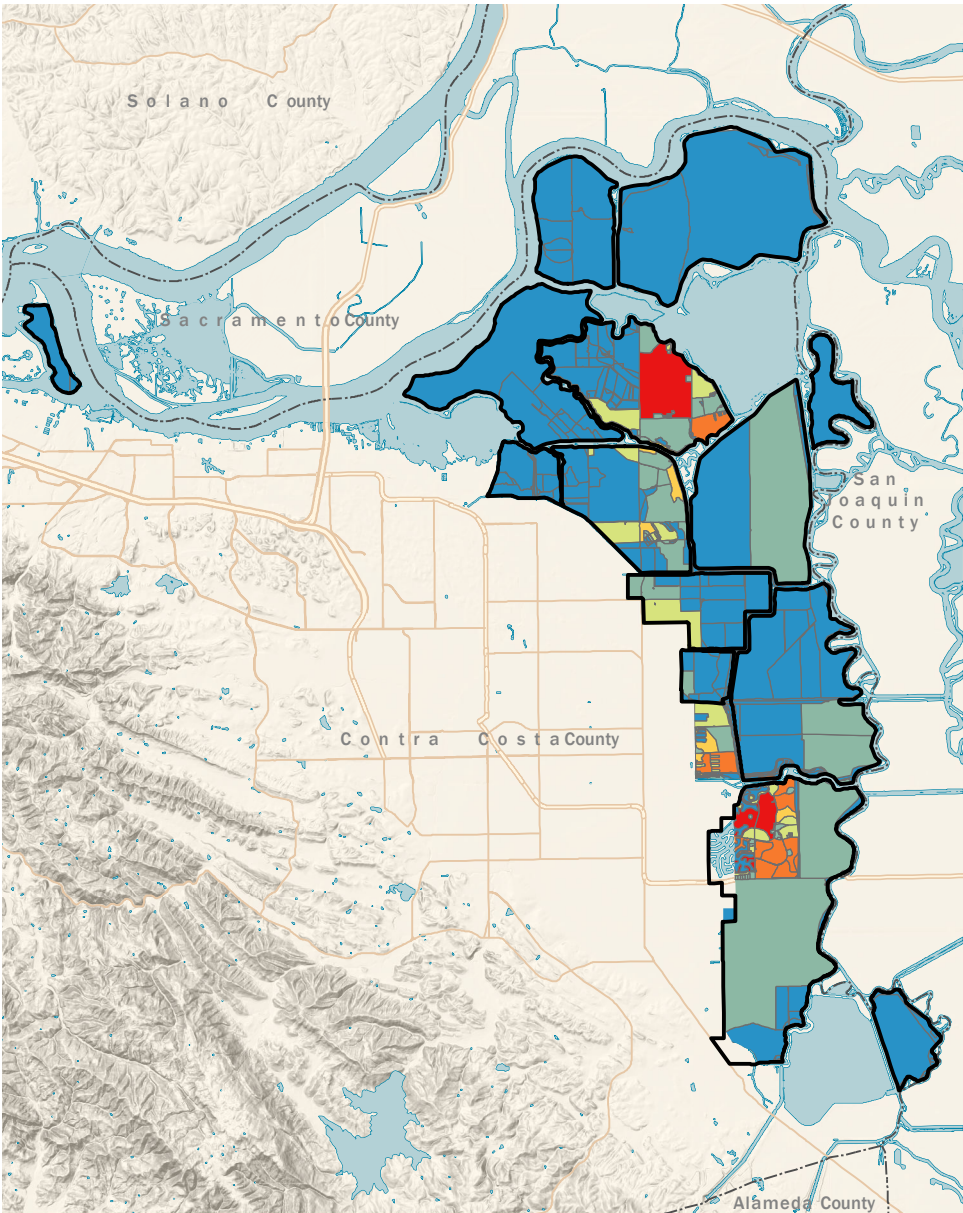
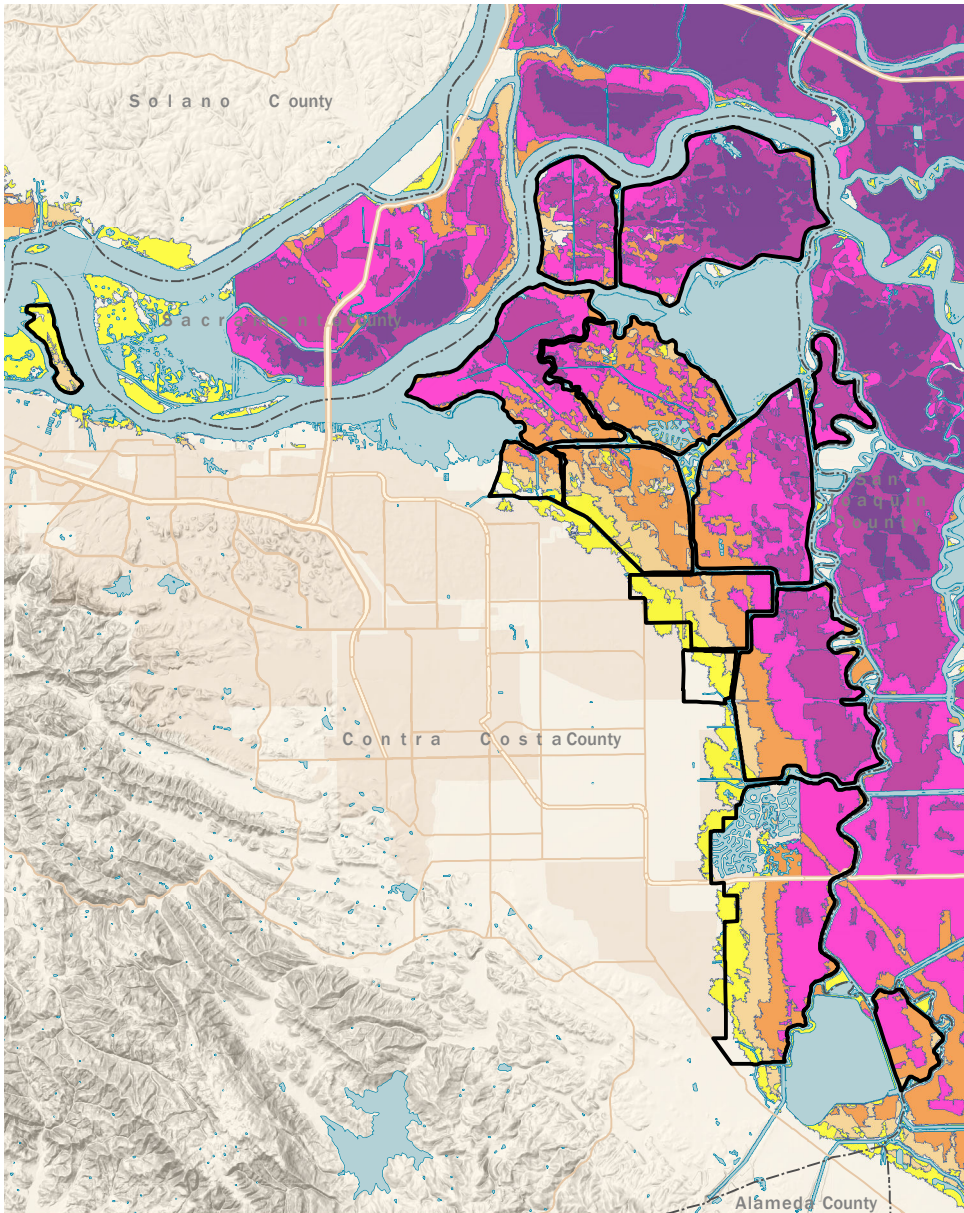


DYNAMIC PLANNING + SCIENCE

Ethan Mobley
Dynamic Planning + Science
GIS & Planning Manager

Brian Greer
Dynamic Planning + Science
Lead Cartographer

Regional Information



EXPLANATION

- Levee Maintenance Area
- County Boundary
- Major Highway
- Primary
- Major
- Water body
- City

ELEVATION ZONES (FT)

- 5 - 10 feet
- 5 - 0 feet
- 15 - -10 feet
- 0 - 5 feet
- 10 - -5 feet
- < -15 feet

POPULATION BY CENSUS BLOCK

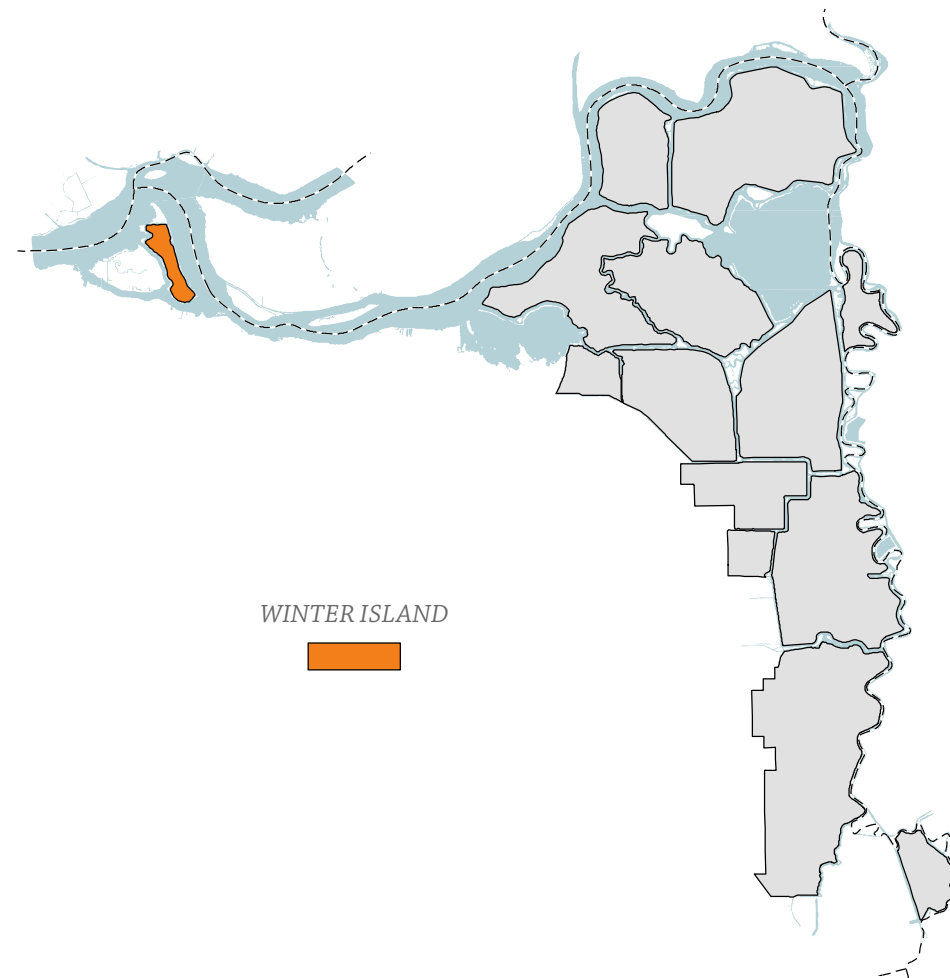
2010 Population

- 0 - 10
- 51 - 100
- 201 - 500
- 11 - 50
- 101 - 200
- 501 - 2000

ENGINEERING REPRESENTATIVE

- Blake Johnson
- GEI
- KSN
- Bloomfield Cherries
- Green Mountain
- MBK

Winter Island RD 2122





Van Sickle Island

Spinner Island

Spoonbill Creek

Point Wall

Point Wise

Point San Joaquin

East Reach

WINTER ISLAND
RD 2122

Pittsburg Landing

Middle Slough

Browns Island

New York Point

West Reach

Point Emmet

New York Slough

Pittsburg Point

Point Beemar

Dowest Slough

Antioch Point

Sherman Lake

Cabin Slough

Willow Pass Rd

10th St

3rd St

Solar St
Solar Ave

Harbor St

14th St

PITTSBURG

Pittsburg

Antioch Hwy

Kirker Creek

Los Medanos

ANTIOCH

4th St

5th St

6th St

7th St

8th St

9th St

10th St

11th St

12th St

13th St

14th St

15th St

16th St

17th St

18th St

19th St

20th St

21st St

22nd St

23rd St

24th St

25th St

26th St

27th St

28th St

29th St

30th St

31st St

32nd St

33rd St

34th St

35th St

36th St

37th St

38th St

39th St

40th St

41st St

42nd St

43rd St

44th St

45th St

46th St

47th St

48th St

49th St

50th St

Sixth Street Park

Lake Alhambra

Map projection and scale: NAD 1983 UTM Zone 10N, 1:24,000

0 950 1,900 3,800 Feet



4

Mokelumne Aqueduct

Somerville Rd

Airto Center Dr

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

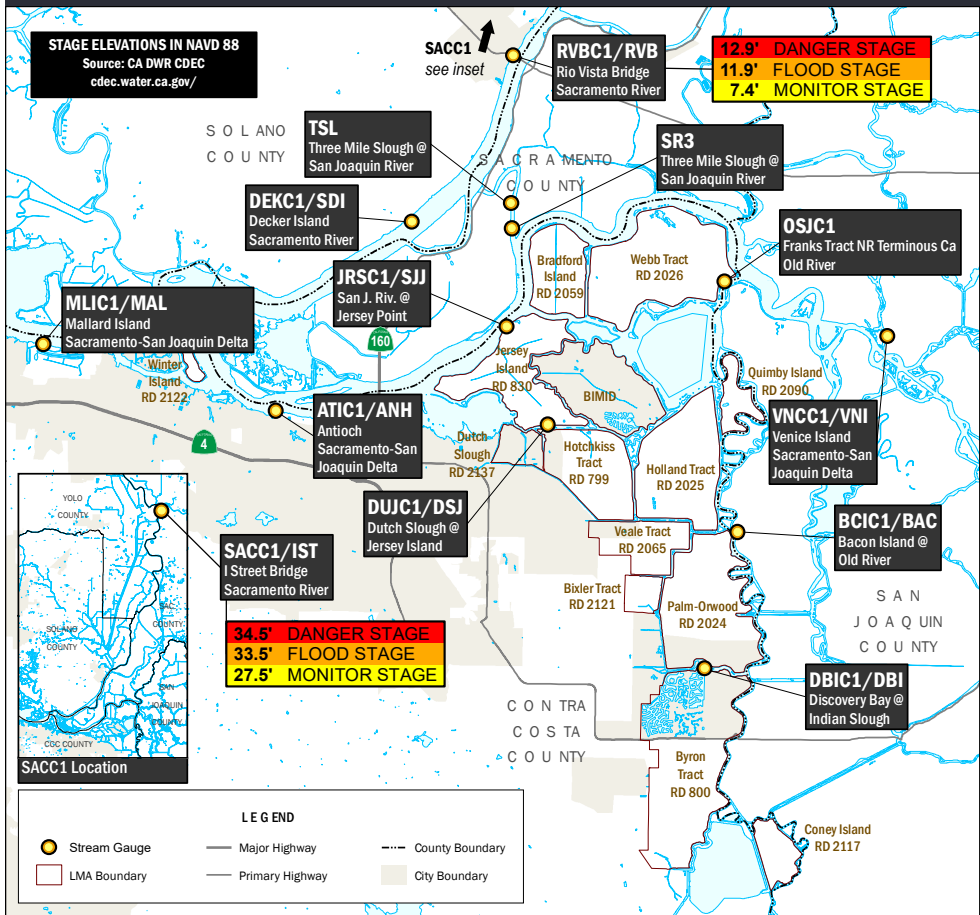
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|-------------------------------------|--|---|
| SACC1/IST I Street Bridge | RVBC1/RVB Rio Vista Bridge | DEKC1 Decker Island |
| MLIC1/MAL Mallard Island | JRSC1/SJJ SJ Riv. @ Jersey Pt | OSJC1 Franks Tract, Terminous |
| ATIC1/ANH Antioch | DUJC1/DSJ Dutch Slough @ Jersey Island | VNCC1/VNI Venice Island |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

FLOOD FIGHT STAGING

Staging area to be located near the Duck Club around station 243+00.
38°01'44.92285320"N, 121°50'38.23835280"W

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

No Known Supply Delivery Points in Map Extent

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

No Known Stockpile Resources in Map Extent

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

DUCK CLUB FLOOD FIGHT MATERIALS

Inventory meets DWR requirements: Visqueen, sandbags, twine, stakes, tie buttons, pliers, sledge hammers, shovels, life vests, survey lathe, flagging tape, markers, pencils and pads, spotlight, tool box and lock.
38°01'43.72295880"N, 121°50'35.02286160"W

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

No Known HazMat Locations in Map Extent

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY OFFICE OF EMERGENCY SERVICES

CCC OES
925-228-5000, 24-HOUR

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.427.8562

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
916.574.2619

CALTRANS

Evacuation/Bridge Support
916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell

JERSEY ISLAND (RD 830)

Chad Davidson
925.625.2279
ER Contact
925.727.2938

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

DUTCH SLOUGH (RD 2137)

Nate Hershey
916.456.4400

PALM-ORWOOD TRACT (RD 2024)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

HOLLAND TRACT (RD 2025)

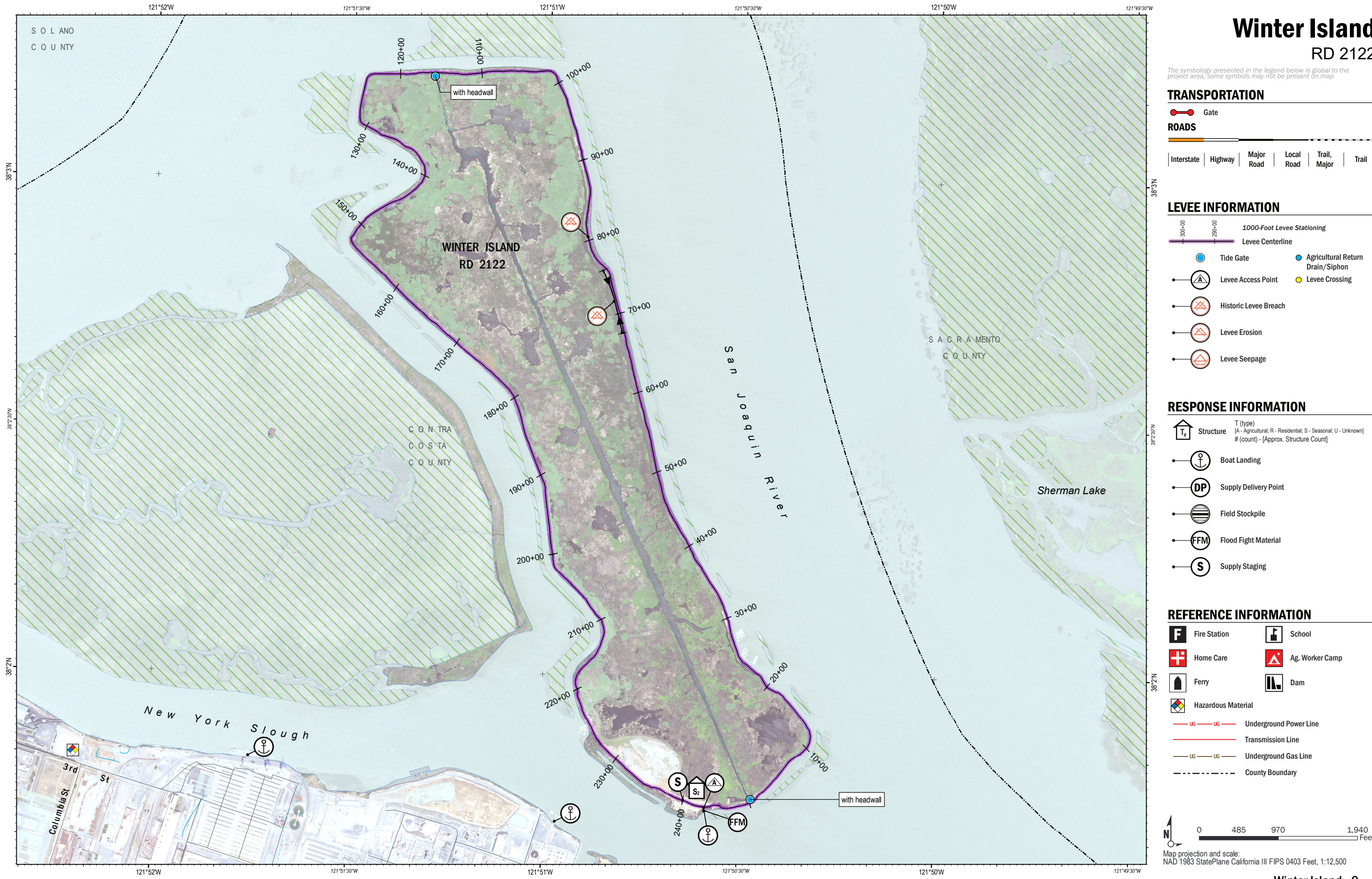
David A. Forkel
925.932.0251
925.693.9977

WEBB TRACT (RD 2026)

Al Warren Hoslett
209.943.5551, Bus.

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300



Winter Island

RD 2122

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

LEVEE INFORMATION

1000-Foot Levee Stationing
Levee Centerline

Tide Gate
Levee Access Point
Historic Levee Breach
Levee Erosion
Levee Seepage

Agricultural Return Drain/Siphon
Levee Crossing

RESPONSE INFORMATION

Structure
T (type)
[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]

Boat Landing
Supply Delivery Point
Field Stockpile
Flood Fight Material
Supply Staging

REFERENCE INFORMATION

Fire Station
Home Care
Ferry
Hazardous Material
School
Ag. Worker Camp
Dam

Underground Power Line
Transmission Line
Underground Gas Line
County Boundary

0 485 970 1,940 Feet

Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:12,500

FLOOD CONTINGENCY PLANNING INFORMATION

D2 A.1. SPECIAL FLOOD CONSIDERATIONS

N1 - TIDE GATE #1
Infrastructure includes tide gates and bulkheads for irrigation and drainage. A bulkhead with a tide gate is located near station 0+00. Tide gates are used to control flow in and out of island.

N2 - TIDE GATE #2
Infrastructure includes tide gates and bulkheads for irrigation and drainage. A bulkhead with a tide gate is located near station 116+00. Tide gates are used to control flow in and out of the island.

N3 - EROSION POTENTIAL
Erosion potential along entire District. Minimal bank protection in most locations. The intact remnant berms provide protection during normal tidal cycles with fetches between 150 - 200 feet.

N4 - EVACUATION CONSIDERATIONS
Primary exit route is located at station 244+00. Exit island by boat at Winter Island heading south to boat dock north of Mt. Diablo Sanitation District in Antioch, proceed south through Mt. Diablo Sanitation District to Pittsburg-Antioch Highway. Population ranges from 0-20 depending on the time of year. During the winter months when the Island operates as a duck club, there can be as many as 20 people on the island.

N5 - LEVEE CONDITIONS
There is no levee certification status. The levee crown generally is below the HMP elevation and narrow. There is no all-weather roadway surface. The District will continue to work toward meeting the HMP levee geometry in the future. Various locations of the District are armored with riprap and concrete debris.

N6 - LEVEE BREACH
There is a levee breach that is in the process of being repaired on the east levee between stations 68+50 and 74+00.

N7 - GENERAL NOTE
There are structures on the south levee associated with the Duck Club; boat houses, docks, and maintenance buildings, as well as associated electrical lines. The land has primarily been used for habitat and managed wetland.

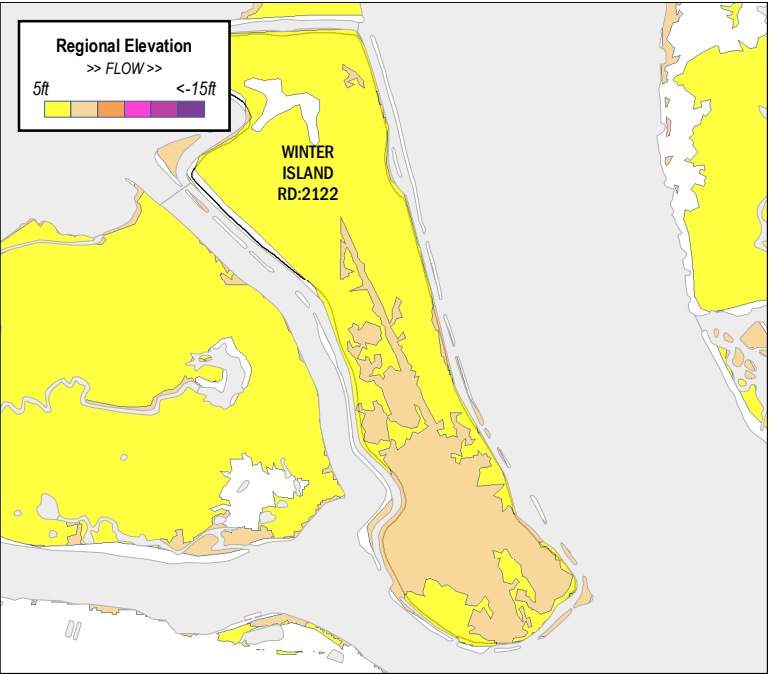
N8 - FETCH FROM OPEN WATERS
Fetch varies dramatically depending on tidal stage or river flows. The District is generally surrounded by a dredge cut with remnant berms along the exterior of the cut. There are numerous locations where the berm no longer exists or has deteriorated over time. The northwest corner of the District has a 6-7 mile wind fetch from the west across the San Joaquin River and Honker Bay. Other fetch areas along the District average closer to 0.75 miles from various directions.

N9 - GENERAL FLOOD THREAT
The flooding threat is predominantly tidal, with runoff from the Sacramento-San Joaquin Delta tributaries that can influence conditions. The Sacramento River flows come from the northeast and the San Joaquin River flows come from the southeast. The San Joaquin River Deep Water Ship Channel is adjacent to the south levee.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



D3 F B.1. FLOOD CONTINGENCY OPTIONS

N1 - WAVE WASH
Wind waves could occur at this location. Wind waves causing erosion will lead to levee failure if not addressed for long periods of time; protection area approximately 300 feet.

ACTIONS
Purchase sandbags and plastic. Utilize material on high ground to fill sandbags and build wavewash protection on south levee.

1. Deploy flood fight materials to prevent levee degradation around 5.5 acre easement, protecting structures on high ground on the south end of the island.
 2. Protect area exposed to wind waves with envelope style wrap.
- Wave Wash Protection Material
Required:
300 feet of envelope wave wash will require approximately 6 rolls of 10 mil plastic sheeting, 90 sandbags, 45 cubic feet of sand, 6 rolls of twine, 30 plastic buttons or rocks, and 60 [1” x 3” x 2’] stakes.

N2 - OVERTOPPING
Overtopping due to tide action or weather could occur at this location.

ACTIONS
Temporary Earthen Levee Material

C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

| FLOOD FIGHT LABOR | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |

REPAIR CONTRACTORS

| | | | |
|--|--|---|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |
|--|--|---|---|

MATERIALS SUPPLIERS

| | | |
|--|---|---|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
|--|---|---|

| | | |
|--|--|---|
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |
|--|--|---|

| | | |
|--|---|--|
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |
|--|---|--|

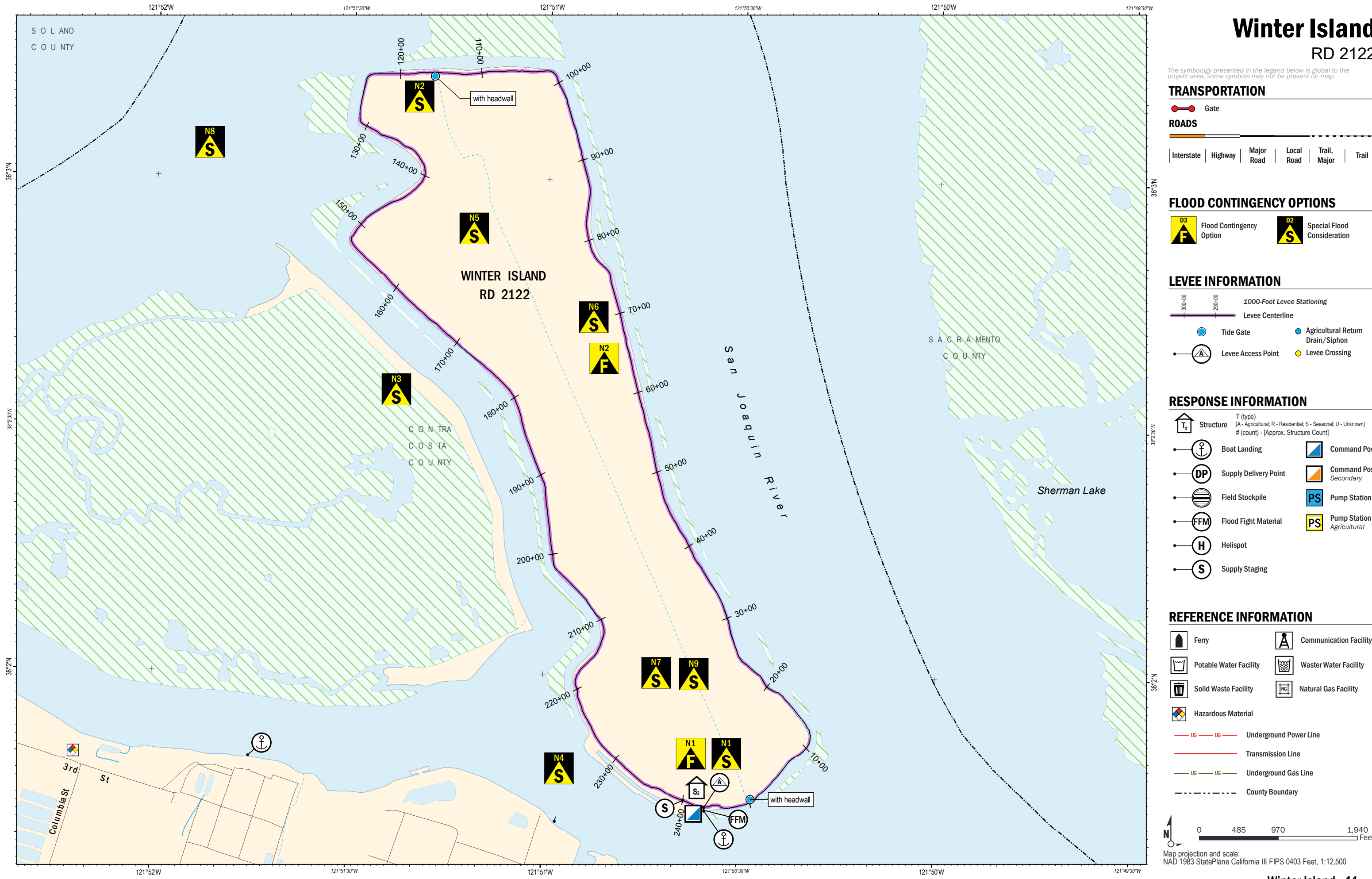
| | | |
|--|--|--|
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 | |
|--|--|--|

LOCAL SUPPLY PROVIDERS

| | | |
|---|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
|---|---|--|

| | | |
|--|---|--|
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |
|--|---|--|

| | | |
|--|--|--|
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 | |
|--|--|--|



Winter Island

RD 2122

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate | Highway | Major Road | Local Road | Trail, Major | Trail

FLOOD CONTINGENCY OPTIONS

D3 Flood Contingency Option

D2 Special Flood Consideration

LEVEE INFORMATION

1000-Foot Levee Stationing

Levee Centerline

Tide Gate

Levee Access Point

Agricultural Return Drain/Siphon

Levee Crossing

RESPONSE INFORMATION

Structure

T (type) [A - Agricultural; R - Residential; S - Seasonal; U - Unknown]

(count) - [Approx. Structure Count]

Boat Landing

Supply Delivery Point

Field Stockpile

Flood Fight Material

Helispot

Supply Staging

Command Post

Command Post Secondary

Pump Station

Pump Station Agricultural

REFERENCE INFORMATION

Ferry

Potable Water Facility

Solid Waste Facility

Hazardous Material

Communication Facility

Waster Water Facility

Natural Gas Facility

UG Underground Power Line

Transmission Line

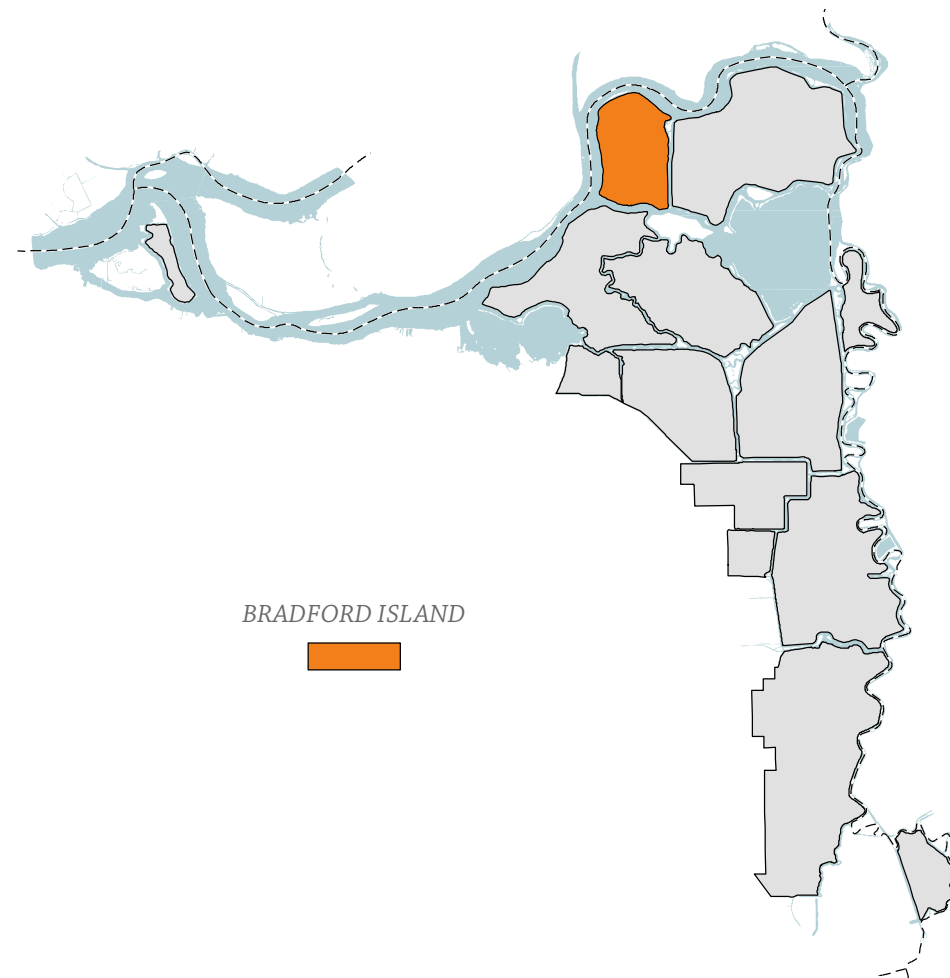
UG Underground Gas Line

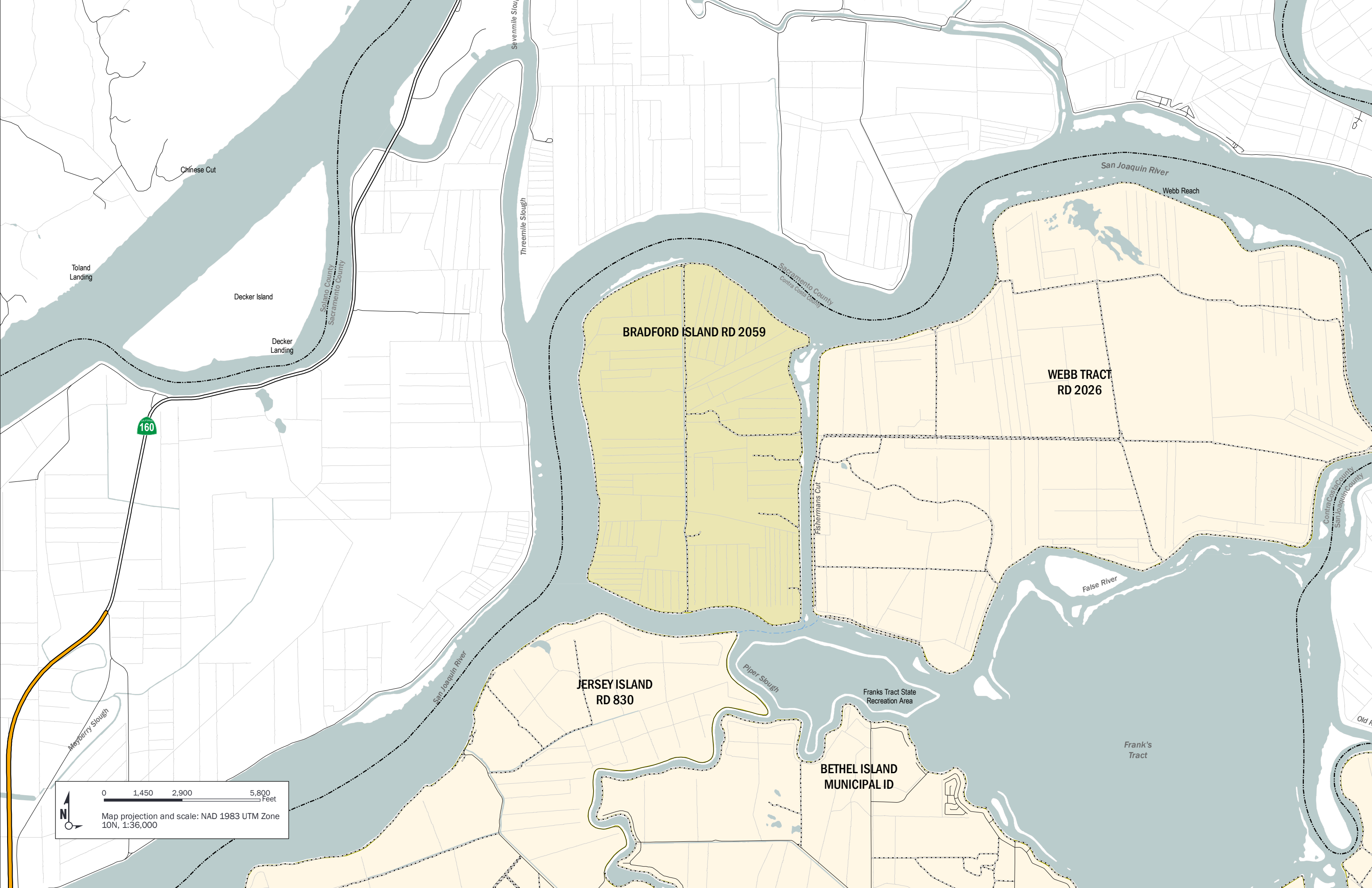
County Boundary

0 485 970 1,940 Feet

Map projection and scale: NAD 1983 StatePlane California III FIPS 0403 Feet, 1:12,500

Bradford Island..... RD 2059





Chinese Cut

Toland Landing

Decker Island

Decker Landing

160

Maryberry Slough

San Joaquin River

Threemile Slough

Sevenmile Slough

Sacramento County
Contra Costa County

Fishermans Cut

Piper Slough

Franks Tract State
Recreation Area

San Joaquin River

Webb Reach

Contra Costa County
San Joaquin County

False River

Frank's
Tract

Old F

BRADFORD ISLAND RD 2059

WEBB TRACT
RD 2026

JERSEY ISLAND
RD 830

BETHEL ISLAND
MUNICIPAL ID

N

01,4502,9005,800
Feet

Map projection and scale: NAD 1983 UTM Zone 10N, 1:36,000

EVACUATION / RESCUE INFORMATION

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

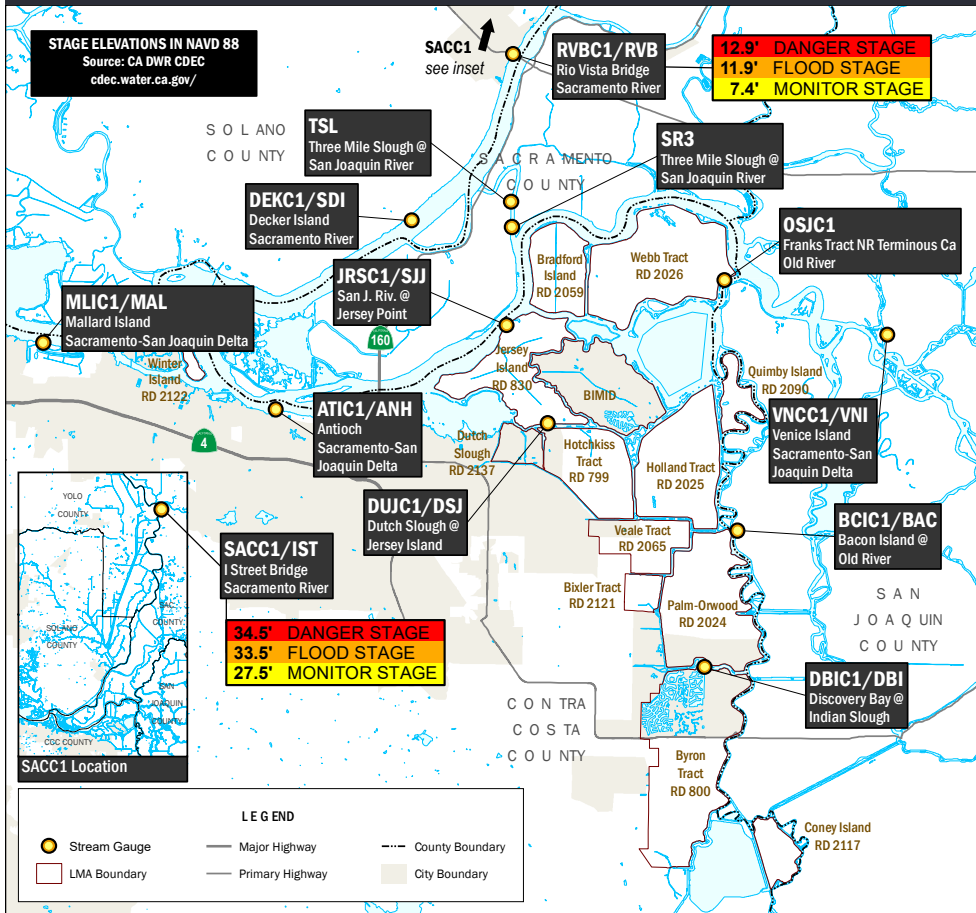
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|-------------------------------------|--|---|
| SACC1/IST I Street Bridge | RVBC1/RVB Rio Vista Bridge | DEKC1 Decker Island |
| MLIC1/MAL Mallard Island | JRSC1/SJJ SJ Riv. @ Jersey Pt | OSJC1 Franks Tract, Terminous |
| ATIC1/ANH Antioch | DUJC1/DSJ Dutch Slough @ Jersey Island | VNCC1/VNI Venice Island |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

No Known Staging Areas in Map Extent

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

SUPPLY DELIVERY POINT

Supply delivery point via barge, wide road
38°04'23.87713800"N, 121°40'31.79744760"W

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

FLOOD RESPONSE RESOURCES

Pre-staged rip rap.
38°04'26.11532640"N, 121°40'31.36524960"W

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

FLOOD FIGHT MATERIALS

muscle wall ~40 pieces, shovels, picks, hammers, sledge hammers, life jackets, fire extinguishers, twine, sheeting visqueen, sandbags 1 large bag, stakes 10 dozen
38°04'22.46067480"N, 121°38'56.39071200"W

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

No Known HazMat Locations in Map Extent

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.313.2000

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.313.2000

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
800.952.5530

CALTRANS

Evacuation/Bridge Support
916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

DUTCH SLOUGH (RD 2137)

Nate Hershey
916.456.4400

PALM-ORWOOD TRACT (RD 2024)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

HOLLAND TRACT (RD 2025)

David A. Forkel
925.932.0251
Bus. 925.693.9977
Bus. Cell

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

JERSEY ISLAND (RD 830)

Chad Davidson 925.625.2279
ER Contact 925.727.2938

WEBB TRACT (RD 2026)

Al Warren Hoslett
209.943.5551, Bus.

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300

Bradford Island

RD 2059

The symbology presented in the legend below is global to the project area. Some symbols may not be present on map.

TRANSPORTATION

- Gate
- ROADS
- Interstate Highway Major Road Local Road Trail, Major Trail

EVACUATION

- Rally Point
- EVACUATION ROUTES
- Major Road Local Road

LEVEE INFORMATION

- 1000-Foot Levee Stationing
- Levee Centerline
- Tide Gate
- Levee Access Point
- Historic Levee Breach
- Levee Erosion
- Levee Seepage
- Agricultural Return Drain/Siphon
- Levee Crossing

RESPONSE INFORMATION

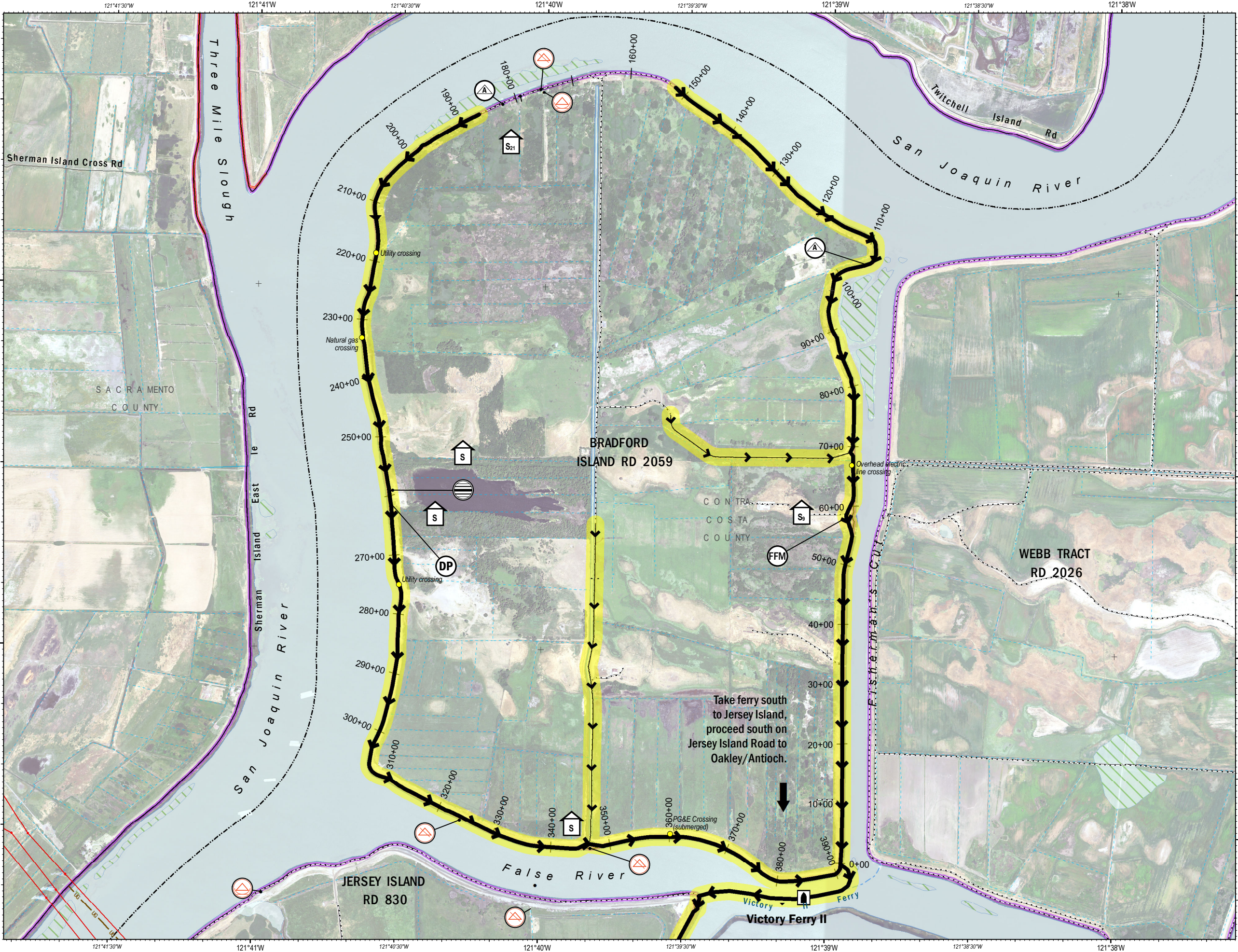
- Structure
- T (type)
[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]
- Boat Landing
- Supply Delivery Point
- Field Stockpile
- Flood Fight Material
- Supply Staging

REFERENCE INFORMATION

- Fire Station
- Home Care
- Ferry
- Hazardous Material
- School
- Ag. Worker Camp
- Dam
- Underground Power Line
- Transmission Line
- Underground Gas Line
- County Boundary



Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:18,600



FLOOD CONTINGENCY PLANNING INFORMATION

A.1. SPECIAL FLOOD CONSIDERATIONS

R1 - LAND USE
Primary land use is agriculture (cattle) and several natural gas wells. There are several ranchers on Bradford Island with approximately 2,000 head of cattle. There are less than 50 full time residents and critical infrastructure consists of one pump station located on the east side of the island.

R2 - DWELLING UNITS
Typical population on Bradford Island totals approx. 9 People. Mostly seasonal Workers. Most dwelling units are located at the highest elevations on the tract above most flood threat.

R3 - MATERIAL STORAGE
Conex Boxes for hazardous material storage are located at various locations. Storage includes diesel Fuel, pesticides, herbicides, hydraulic Fluids. All HazMat below thresholds for reporting to County.

R4 - GENERAL LEVEE CONDITIONS
Bradford Island Levees were raised over the last couple years with 3’ of free board (factor of safety) above flood stage since FEMA encourages to adopt at least a one-foot freeboard. Bradford Island’s Freeboard compensates for the many unknown factors that could contribute to flood heights greater than the height calculated such as wave action. Certification Status of the levees is that most are above the Hazard Mitigation Plan (HMP) standard. Approximately, 600 feet of levee is below the adjacent levee height and during high waters, the district deploys sand bags and or muscle wall (provided by the State) in these areas.

R5 - WAVE ACTION
Significant characteristics that Bradford Island Levees faces is that the San Joaquin River is quite wide (shipping channel) and wind and wave action along the north and western side of island. North side has a barrier structure which protects levees from wave action.

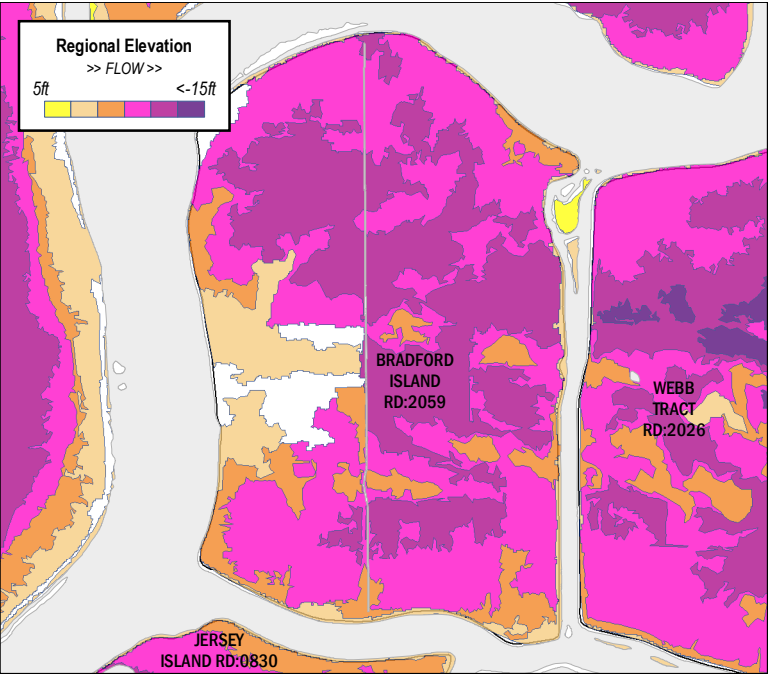
R6 - BOAT TRAFFIC
Boat traffic in Fisherman’s cut causes wave action potential damage to levees may occur.

R7 - FERRY ACCESS
Ferry access and operation information maybe limited in this area. May be present after hours and at lunch. Private ferry, 2 captains. Known issues with operation after captains hit maximum hours.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

R1 - WIND WAVES
Wind waves 1.5 FT in height could occur at this location. Wind waves causing erosion will lead to levee failure if not addressed for long periods of time; protection area approx. 300 FT.
ACTIONS
1. Protect area exposed to wind waves with envelope style wrap.
Wave Wash Protection Material Required:
300 feet of envelope wave wash will require approximately 6 rolls of 10 mil plastic sheeting, 90 sandbags, 45 cubic feet of sand, 6 rolls of twine, 30 plastic buttons or rocks, and 60 [1” x 3” x 2’] stakes.

R2 - LOCAL HIGH WATER EVENT
Multiple high water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. East side of Bradford Island Levee System may be lower than regional high water event. Vulnerable area approx.. 5,000 FT. Muscle wall or temporary earthen levee is recommended.
ACTIONS
1. Close control gate at intake slough.
2. Activate workforce for levee patrols.
3. Move or evacuate cattle population.
4. Prepare resources for temporary earthen levee or muscle wall.
Muscle Wall Material Required:
5000 feet of temporary levee will require approximately 834 segments of muscle wall, 8340 sandbags, and 4170 cubic feet of sand.
OR
Temporary Earthen Levee Material Required:
5000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 100 rolls of 10 mil plastic sheeting, 1500 sandbags, and 225 cubic yards of fill. Approximately 27.8 cubic yards of fill for sand bags and 197.2 cubic yards of fill for visqueen fill.

C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

| FLOOD FIGHT LABOR | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |

| REPAIR CONTRACTORS | | | |
|--|--|---|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |

| MATERIALS SUPPLIERS | | |
|--|---|---|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |

| | | |
|--|--|--|
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 | |

| LOCAL SUPPLY PROVIDERS | | |
|--|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 | |

Bradford Island

RD 2059

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

FLOOD CONTINGENCY OPTIONS

D3 Flood Contingency Option D2 Special Flood Consideration

LEVEE INFORMATION

1000-Foot Levee Stationing
Levee Centerline
Tide Gate Agricultural Return Drain/Siphon
Levee Access Point Levee Crossing

RESPONSE INFORMATION

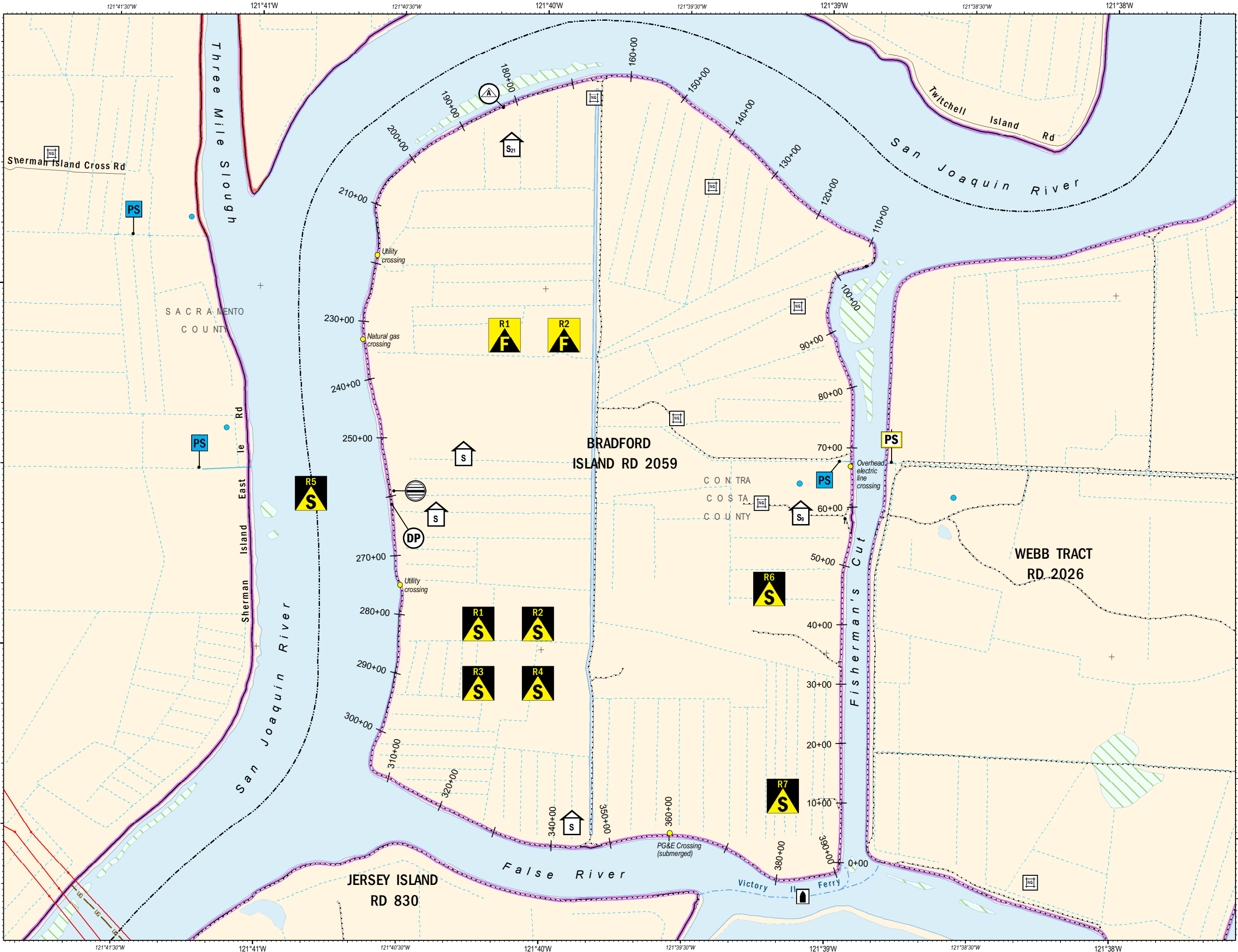
Structure T (type) [A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]
Boat Landing Command Post
Supply Delivery Point Command Post Secondary
Field Stockpile Pump Station
Flood Fight Material Pump Station Agricultural
Helispot
Supply Staging

REFERENCE INFORMATION

Ferry Communication Facility
Potable Water Facility Waster Water Facility
Solid Waste Facility Natural Gas Facility
Hazardous Material
UG Underground Power Line
Transmission Line
UG Underground Gas Line
County Boundary

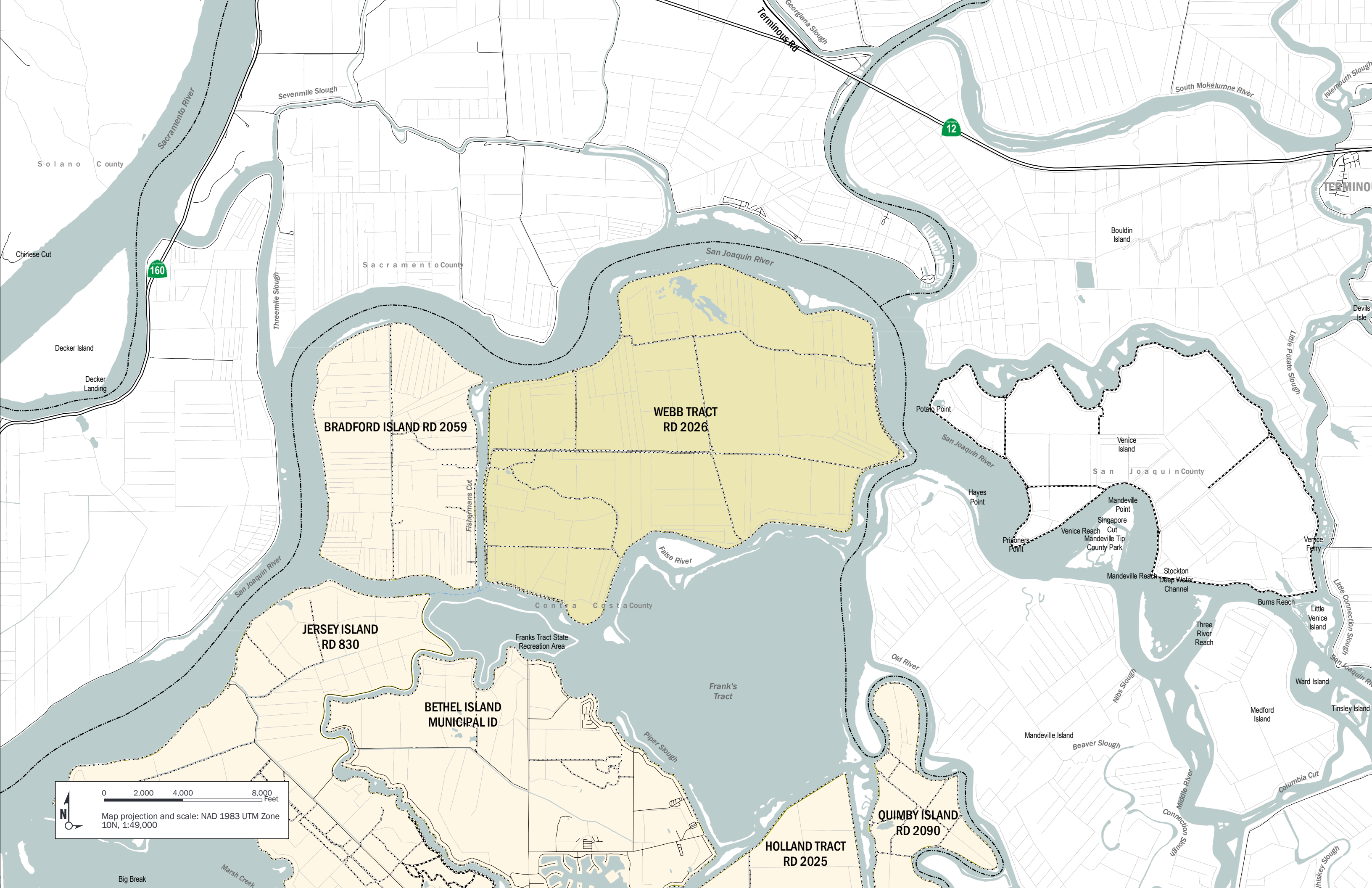
0 700 1,400 2,800 Feet


Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:18,700



Webb Tract RD 2026







0

2,000

4,000

8,000

Feet

Map projection and scale: NAD 1983 UTM Zone 10N, 1:49,000

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

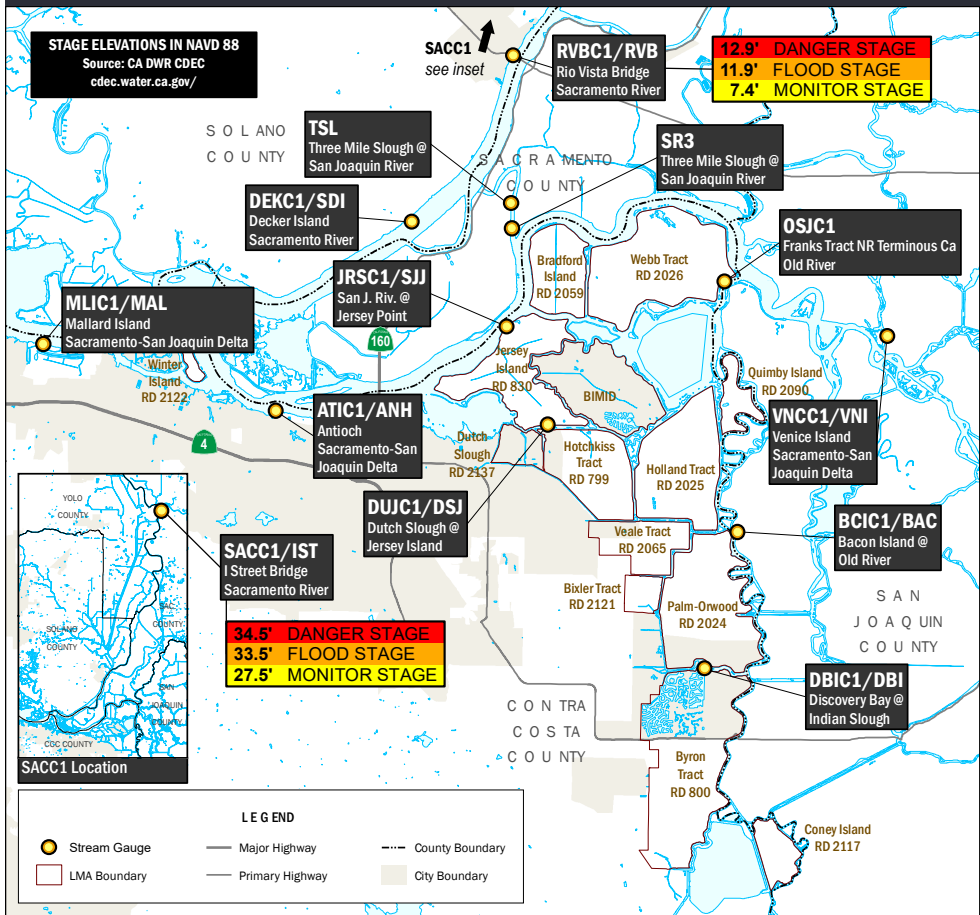
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|-------------------------------------|--|---|
| SACC1/IST I Street Bridge | RVBC1/RVB Rio Vista Bridge | DEKC1 Decker Island |
| MLIC1/MAL Mallard Island | JRSC1/SJJ SJ Riv. @ Jersey Pt | OSJC1 Franks Tract, Terminous |
| ATIC1/ANH Antioch | DUJC1/DSJ Dutch Slough @ Jersey Island | VNCC1/VNI Venice Island |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

STAGING AREA

Staging would occur near the ferry slip at station 0+00.
38°03'25.48110600"N, 121°38'48.01351560"W

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

No Known Supply Delivery Points in Map Extent

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

RIP RAP STOCKPILE

In an event where additional on-island fill materials is needed, fill material is located on the western portion of the island.
38°03'25.86519000"N, 121°38'42.51526080"W

the western portion of the island.
38°04'12.93881880"N, 121°38'13.11270720"W

RIP RAP STOCKPILE

EMERGENCY FILL

In an event where additional on-island fill materials is needed, fill material is located on

In an event where additional on-island fill materials is needed, fill material is located on the north eastern portion of the island.
38°05'36.22355880"N, 121°35'30.01182360"W

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

FLOOD FIGHT STAGING

Inventory meets DWR requirements: Visqueen, sandbags, twine, stakes, tie buttons, pliers, sledge hammers, shovels, life vests, survey lathe, flagging tape, markers, pencils and pads, spotlight, tool box and lock.
38°04'25.42042920"N, 121°34'38.62774560"W

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

No Known HazMat Locations in Map Extent

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY OFFICE OF EMERGENCY SERVICES

CCC OES
925-228-5000, 24-HOUR

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.427.8562

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
916.574.2619

CALTRANS

Evacuation/Bridge Support
916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell
DUTCH SLOUGH (RD 2137)

JERSEY ISLAND (RD 830)

Chad Davidson
925.625.2279
ER Contact
925.727.2938

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

HOLLAND TRACT (RD 2025)

David A. Forkel
925.932.0251
925.693.9977

PALM-ORWOOD TRACT (RD 2024)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

WEBB TRACT (RD 2026)

Al Warren Hoslett
209.943.5551, Bus.

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300



Webb Tract

RD 2026

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

LEVEE INFORMATION

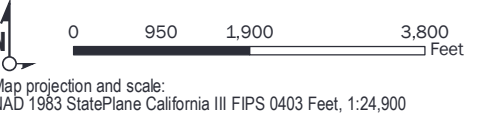
- 1000-Foot Levee Stationing
Levee Centerline
- Tide Gate
 - Levee Access Point
 - Historic Levee Breach
 - Levee Erosion
 - Levee Seepage
 - Agricultural Return Drain/Siphon
 - Levee Crossing

RESPONSE INFORMATION

- Structure
T (type)
[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]
- Boat Landing
 - Supply Delivery Point
 - Field Stockpile
 - Flood Fight Material
 - Supply Staging

REFERENCE INFORMATION

- Fire Station
- Home Care
- Ferry
- Hazardous Material
- School
- Ag. Worker Camp
- Dam
- Underground Power Line
- Transmission Line
- Underground Gas Line
- County Boundary



FLOOD CONTINGENCY PLANNING INFORMATION

A.1. SPECIAL FLOOD CONSIDERATIONS

W1 - PUMP STATION 1
Located near Station 165+00. These discharge pumps may be used during a major flood event; however, additional pumps would be needed to dewater the island.

W2 - PUMP STATION 2
Located near Station 614+00. This discharge pump may be used during a major flood event; however, additional pumps would be needed to dewater the island.

W3 - EVACUATION CONSIDERATIONS
Webb Tract is not linked by bridges to the mainland. Access to and from Webb Tract is dependent on the Delta Ferry Authority, which provides ferry service. Primary exit route located at ferry slip at station 0+00. A duck club is located on the southeast levee, and a farming complex is located on the western portion of the island. The Victory II Ferry is made available to local farmers, contractors, and employees. Ferry service is not guaranteed and is subject to availability of captain/crew, weather and other safety issues, and mechanical failures. After-hour service may be required if Webb Tract needs to be evacuated.

W4 - FETCH FROM OPEN WATERS
The wave fetch is relatively short on the western portion of the island, along Fisherman’s Cut. Fetch is significantly greater over much of the remainder of the District. The southern portion of the island has a wave fetch of up to 3.5 miles across Franks Tract. Channel widths generally vary from 400 to 3,250 feet. The levees are armored with riprap.

W5 - GENERAL LEVEE CONDITIONS
There is no levee certification status for Webb Tract. The levee crown generally meets the requirements of the Hazard Mitigation Plan configuration, and many areas are compliant with PL 84-99 and Bulletin 192-82. The District continues to rehabilitate and maintain the levees as funds permit.

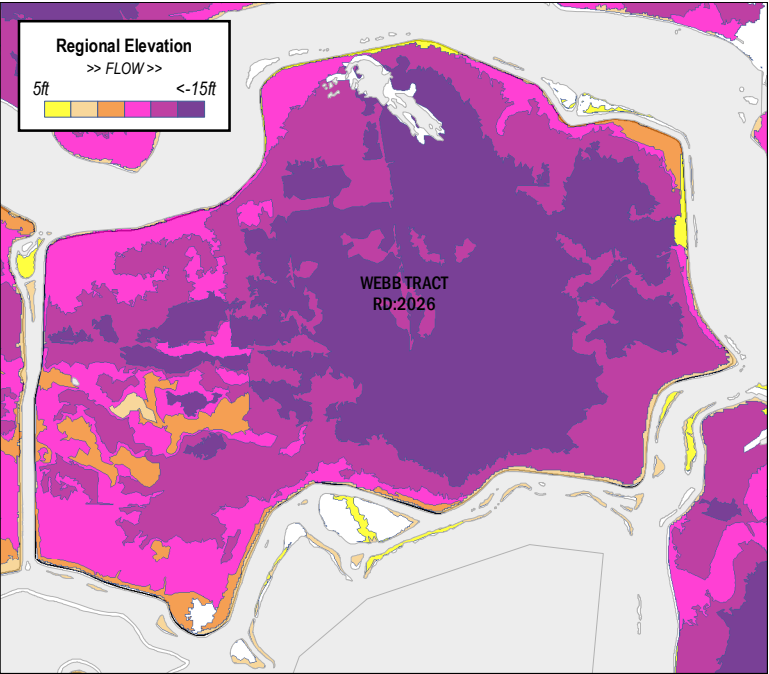
W6 - GENERAL INFRASTRUCTURE
Infrastructure includes pumping stations for drainage and associated electrical lines.

W7 - GENERAL FLOOD THREATS
The flooding threat is predominantly tidal, with some local runoff that can influence conditions. The San Joaquin River could pose a riverine flooding threat. Franks Tract is located to the south. This large expanse of open water can create erosion due to wind/waves.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

W1 - OVERTOPPING
Overtopping due to tide action or weather could occur at this location.
ACTIONS
The District maintains stockpiles of riprap on the island and has equipment available to perform levee maintenance and repairs.
Temporary Earthen Levee Material Required:
4000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 80 rolls of 10 mil plastic sheeting, 1200 sandbags, and 180 cubic yards of fill. Approximately 22.2 cubic yards of fill for sand bags and 157.8 cubic yards of fill for visqueen fill.

W2 - HIGH WATER EVENT
Multiple high water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Vulnerable area approx.. 5,000 FT. Muscle wall or temporary earthen levee is recommended.
ACTIONS
1. Activate workforce for levee patrols.
2. Prepare resources for temporary earthen levee or muscle wall.
Muscle Wall Material Required:
5000 feet of temporary levee will require approximately 834 segments of muscle wall, 8340 sandbags, and 4170 cubic feet of sand.

OR
Temporary Earthen Levee Material Required:
5000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 100 rolls of 10 mil plastic sheeting, 1500 sandbags, and 225 cubic yards of fill. Approximately 27.8 cubic yards of fill for sand bags and 197.2 cubic yards of fill for visqueen fill.

W3 - BOIL FROM SEEPAGE THROUGH LEVEE
Boil events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Not associated with wind generated waves and erosion. Response to boils require sack ring, or boil ring, to control water flow and pressure through levee to minimize transport of fine material through seepage that has uncontrolled flow of water and transport of levee material. Tides and low pressure can play a part in both wind and seepage impact potential. Potential at station 505+00 and 230+00.

ACTIONS
1. Protect and isolate seepage area with boil sack ring.

C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

| FLOOD FIGHT LABOR | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |

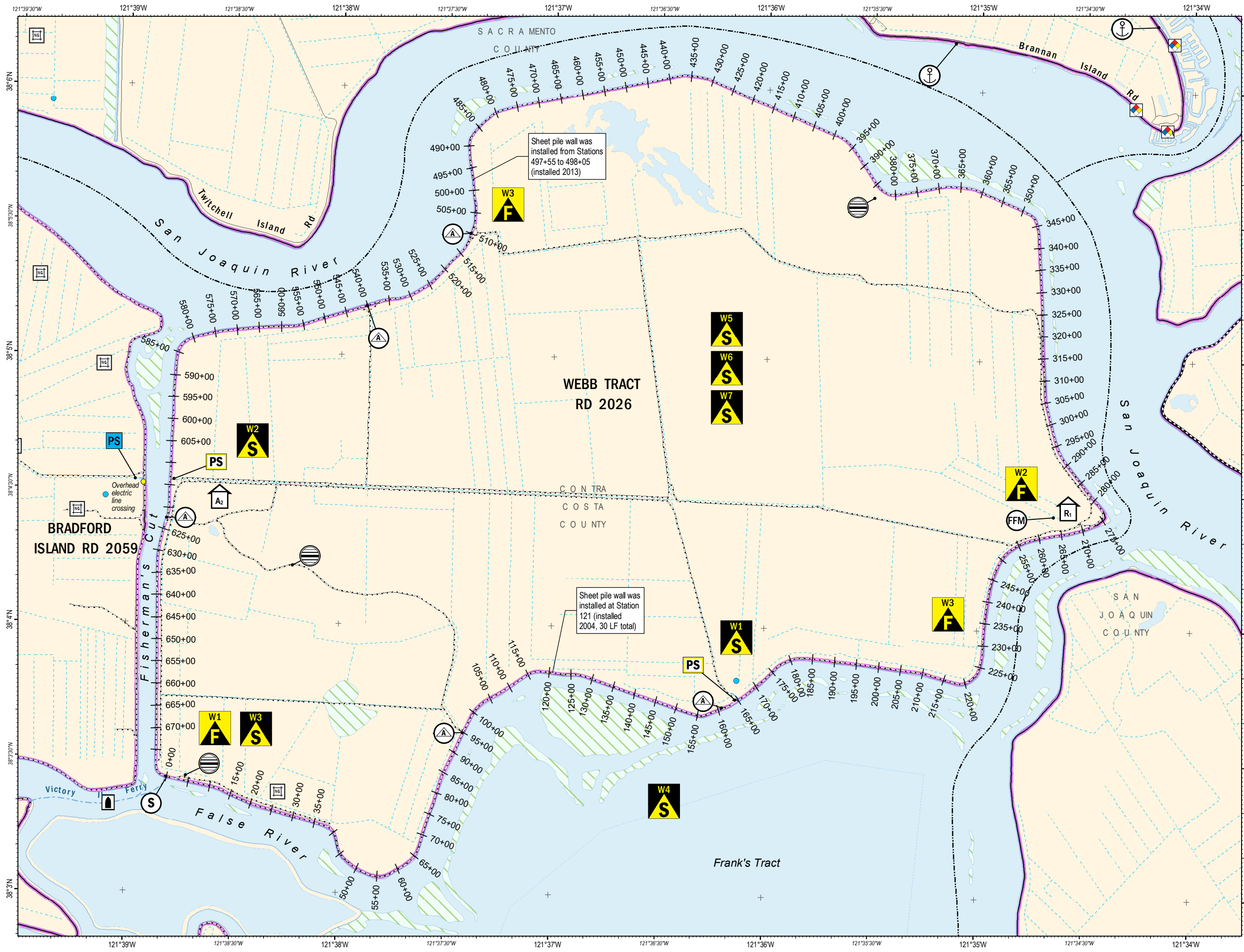
| REPAIR CONTRACTORS | | | |
|--|--|---|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |

| MATERIALS SUPPLIERS | | |
|--|---|---|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |

| | | |
|--|--|--|
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 | |

| LOCAL SUPPLY PROVIDERS | | |
|--|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |

| | | |
|--|--|--|
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 | |
|--|--|--|



Webb Tract

RD 2026

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

FLOOD CONTINGENCY OPTIONS

D3 Flood Contingency Option D2 Special Flood Consideration

LEVEE INFORMATION

1000-Foot Levee Stationing Levee Centerline Tide Gate Agricultural Return Drain/Siphon Levee Access Point Levee Crossing

RESPONSE INFORMATION

Structure T (type) [A - Agricultural, R - Residential, S - Seasonal, U - Unknown] # (count) - [Approx. Structure Count] Boat Landing Command Post Supply Delivery Point Command Post Secondary Field Stockpile PS Pump Station FFM Flood Fight Material PS Pump Station Agricultural H Helispot S Supply Staging

REFERENCE INFORMATION

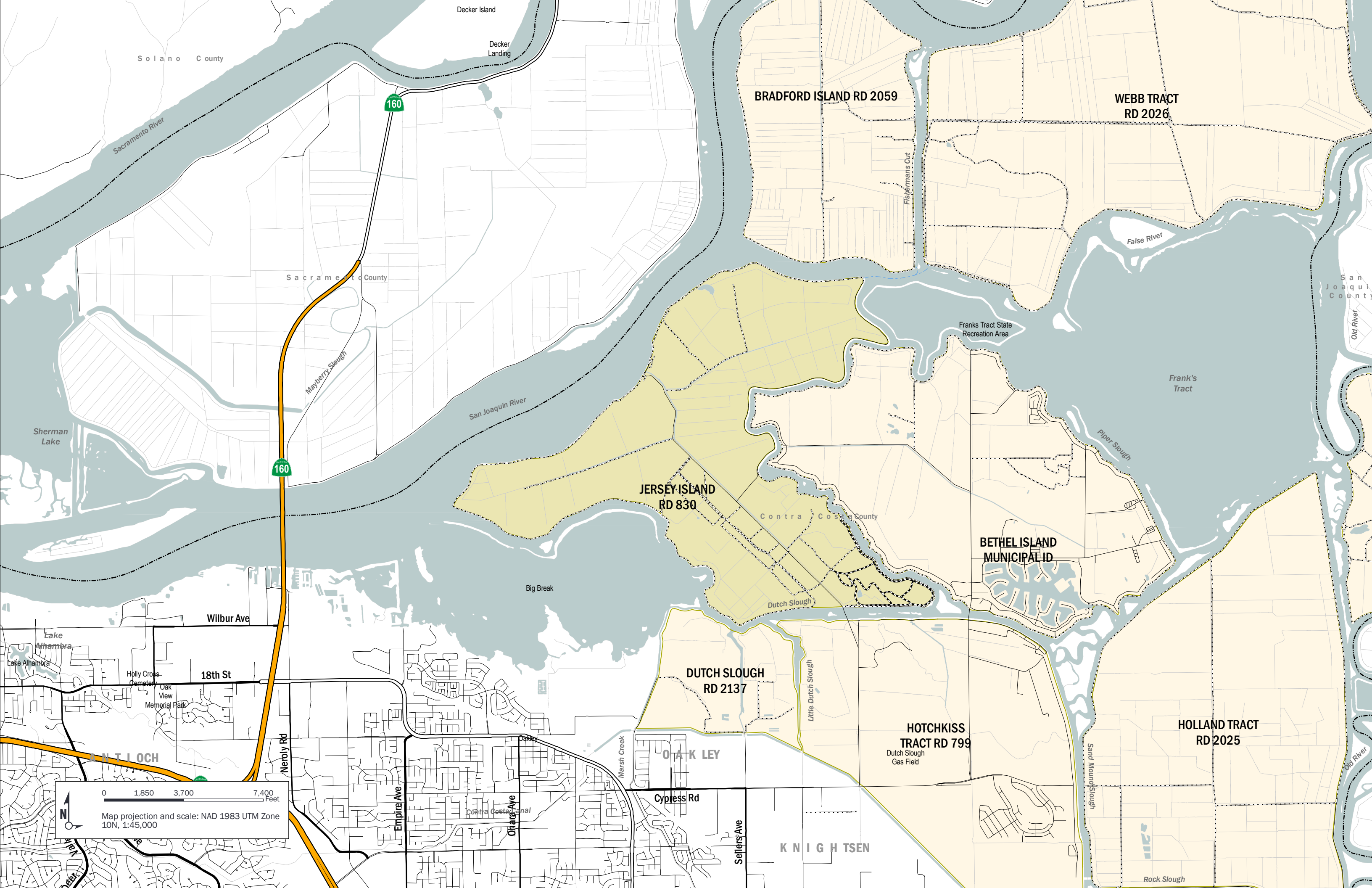
Ferry Communication Facility Potable Water Facility Waster Water Facility Solid Waste Facility Natural Gas Facility Hazardous Material UG Underground Power Line Transmission Line UG Underground Gas Line County Boundary

0 950 1,900 3,800 Feet

Map projection and scale: NAD 1983 StatePlane California III FIPS 0403 Feet, 1:24,900

Jersey Island..... RD 830





0 1,850 3,700 7,400 Feet

Map projection and scale: NAD 1983 UTM Zone 10N, 1:45,000

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

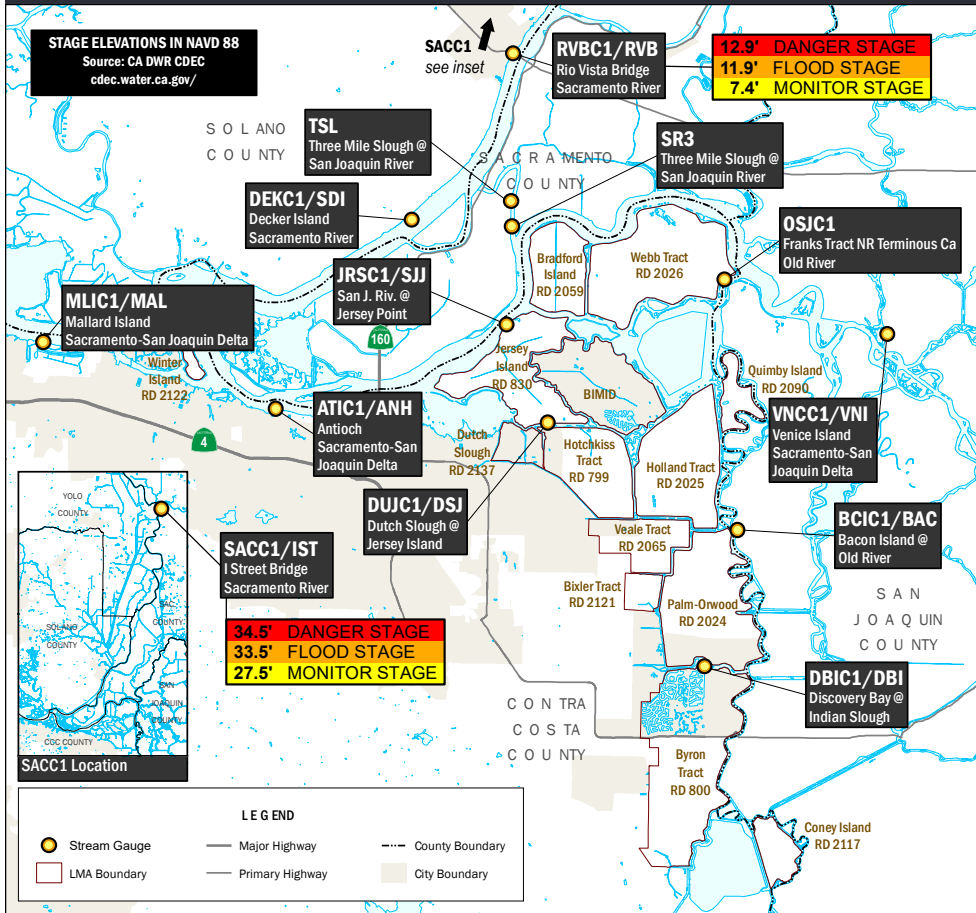
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|-------------------------------------|--|---|
| SACC1/IST I Street Bridge | RVBC1/RVB Rio Vista Bridge | DEKC1 Decker Island |
| MLIC1/MAL Mallard Island | JRSC1/SJJ SJ Riv. @ Jersey Pt | OSJC1 Franks Tract, Terminous |
| ATIC1/ANH Antioch | DUJC1/DSJ Dutch Slough @ Jersey Island | VNCC1/VNI Venice Island |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

FLOOD FIGHT STAGING

The staging area would be located near the district headquarters.
38°02'35.35288080"N, 121°41'31.50919680"W

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

No Known Supply Delivery Points in Map Extent

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

| | | |
|--|---|--|
| RIP RAP STOCKPILE C-pasture rock stockpiles: Approximately 450 tons 18-24" rock stockpile. 38°01'02.48045160"N, 121°39'40.27488840"W | 24" rock stockpile. 38°02'28.69885320"N, 121°40'35.34609000"W | EMERGENCY FILL In an event where additional on-island fill material is needed, stockpiles of fill are located on the north portion of the island. 38°03'17.24606640"N, 121°40'44.99051520"W |
| RIP RAP STOCKPILE Ferry Road rock stockpile: Approximately 450 tons 18-24" rock stockpile. | FILL/EARTHEN MATERIAL STOCKPILE Approximately (5) cubic yards of sand. 38°02'35.35006560"N, 121°41'31.50971880"W | |

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

FLOOD FIGHT MATERIAL

Inventory at District Headquarters meets DWR requirements: Visqueen, sandbags, twine, stakes, tie buttons, pliers, sledge hammers, shovels, life vests, survey lathe, flagging tape, markers, pencils and pads, spotlight, tool box and lock.
38°02'35.35006560"N, 121°41'31.50971520"W

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

No Known HazMat Locations in Map Extent

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY OFFICE OF EMERGENCY SERVICES

CCC OES
925-228-5000, 24-HOUR

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.427.8562

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
916.574.2619

CALTRANS

Evacuation/Bridge Support
916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell

JERSEY ISLAND (RD 830)

Chad Davidson
925.625.2279
ER Contact
925.727.2938

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

DUTCH SLOUGH (RD 2137)

Nate Hershey
916.456.4400

PALM-ORWOOD TRACT (RD 2024)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

HOLLAND TRACT (RD 2025)

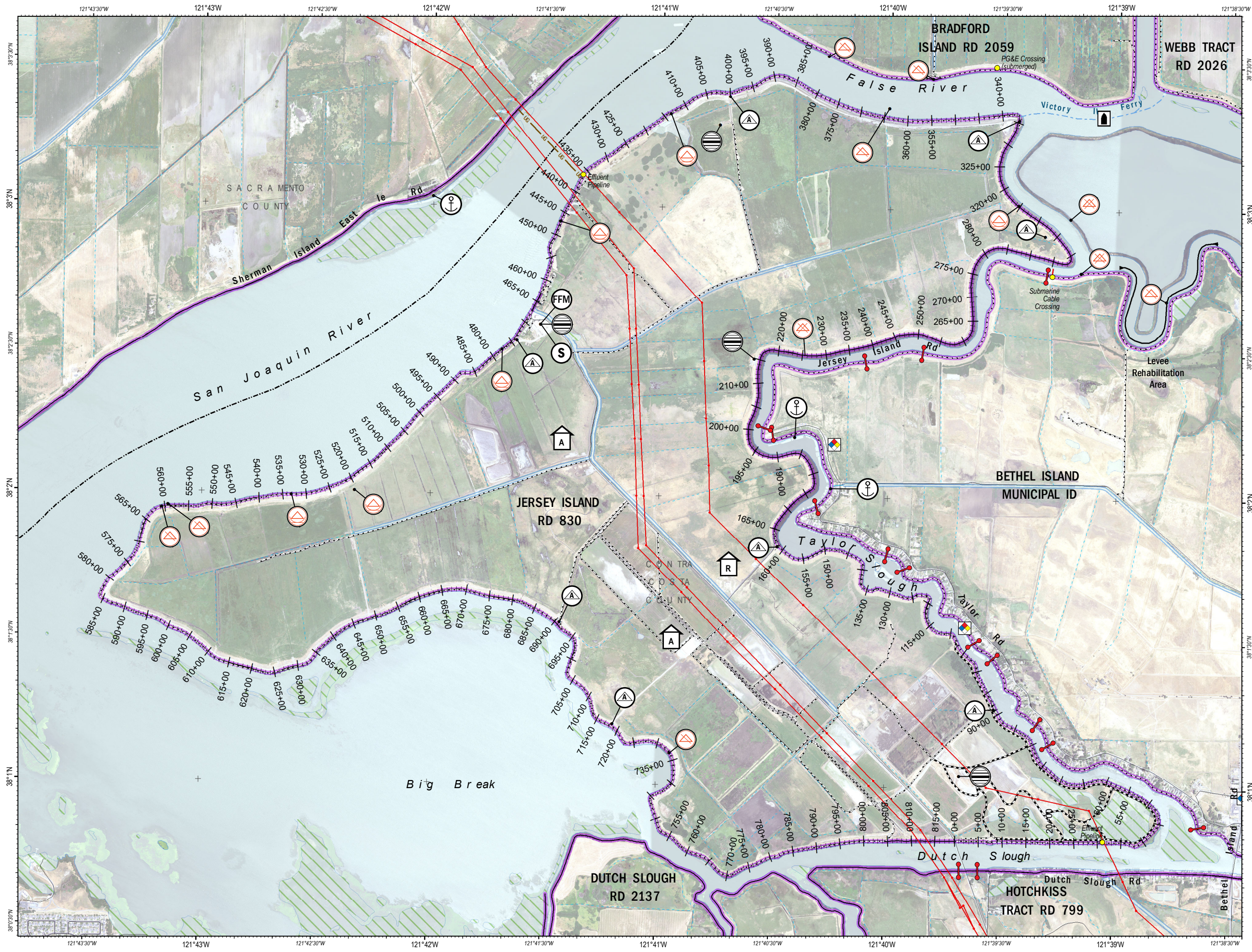
David A. Forkel
925.932.0251
925.693.9977

WEBB TRACT (RD 2026)

Al Warren Hoslett
209.943.5551, Bus.

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300



Jersey Island

RD 830

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

- Gate

ROADS

- Interstate
- Highway
- Major Road
- Local Road
- Trail, Major
- Trail

LEVEE INFORMATION

- 1000-Foot Levee Stationing
- Levee Centerline
- Tide Gate
- Levee Access Point
- Historic Levee Breach
- Levee Erosion
- Levee Seepage
- Agricultural Return Drain/Siphon
- Levee Crossing

RESPONSE INFORMATION

- Structure (T type) [A - Agricultural; R - Residential; S - Seasonal; U - Unknown] # (count) - [Approx. Structure Count]
- Boat Landing
- Supply Delivery Point
- Field Stockpile
- Flood Fight Material
- Supply Staging

REFERENCE INFORMATION

- Fire Station
- Home Care
- Ferry
- Hazardous Material
- School
- Ag. Worker Camp
- Dam
- Underground Power Line
- Transmission Line
- Underground Gas Line
- County Boundary



Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:23,200

FLOOD CONTINGENCY PLANNING INFORMATION



A.1. SPECIAL FLOOD CONSIDERATIONS

J1 - PUMP STATION 1

Located near station 467+00. These discharge pumps may be used during a major flood event; however, additional pumps would be required to dewater the island.

J2 - UTILITY INFRASTRUCTURE

The island has high-voltage towers and transmission lines. Two electrical transmission lines run parallel to the western side of Jersey Island Road (Path 15 Connector) and cross the perimeter levee east of Jersey Island Road Bridge. Another transmission line runs to the east side of Jersey Island Road and crosses the perimeter levee at the confluences of Dutch and Taylor Sloughs. Other infrastructure includes pumping stations for irrigation and drainage and associated electrical lines.

J3 - LEVEE IMPROVEMENTS

The western horn of Jersey Island, at the confluences of the San Joaquin River and Dutch Slough, has undergone levee stability improvements. Improvements include splash berms south and east of the western horn.

J4 - SLOPE

The general slope characteristic is toward the center of the island however, back water flooding is of concern.

J5 - GAS UTILITY INFRASTRUCTURE

Major utility crossings exist in this area. Utility crossings including three sets of high-power electrical lines (PG&E and WAPA), and one 42-inch high-pressure gas main. Coordinate with the local county Office of Emergency Services in the event that utility crews are needed.

J6 - EVACUATION CONSIDERATIONS

Much of the land is used primarily for grazing and growing hay. Up to 2,000 head of cattle can be onsite, depending on the landowner's activities. A caretaker's residence is in the middle of the island (populations ranges from 0 to 5). A county road runs along the island interior and the east levee, providing vehicular access to Bradford Island and Webb Tract. Primary exit route is located at station 0+00, exit along Jersey Island Road towards East Cypress Road..

J7 - DISEASE CONTROL

There are cattle on the island at all times. During a flood, many head of cattle could become trapped and/or perish. Animal carcass management is a concern for disease control. Coordinate with the California Department of Food and Agriculture through the local county Office of Emergency Services for disposal methods.

J8 - FLOOD FIGHT PERSONNEL/MATERIALS

Onsite flood fight personnel are manned through the Reclamation District Headquarters. Personnel have knowledge of in-place standard operating procedures based on daily conditions, schedules, etc. Reclamation District Headquarters has the capability to man a 24/7 levee patrol and preventative preparation in advance of a storm. The District maintains stockpiles of riprap on the island and has equipment available to perform levee maintenance and repairs; 20 cubic yards of sand is stored under the barn at Headquarters. If a storm event is predicted, 6 cubic yards of sand is placed in a dump truck so it is mobile.

J9 - WESTERN WAVE RUN-UP

Storms from a southwest direction can create 4- to 5-foot waves along the San Joaquin River. The western portion of the island has a wave fetch of up to 4.5 miles along the San Joaquin River. The fetch length across Big Break is also up to 4.5 miles. Channel widths generally vary from 220 to 4,550 feet surrounding the island..

J10 - NORTHERN RIVERINE THREAT

The San Joaquin River and False River could pose a riverine flood threat to the northern levees. The levees are all armored with riprap.

J11 - LEVEE STATUS

There is no levee certification status for Jersey Island. The levee crown generally meets the requirements of the Hazard Mitigation Plan configuration, and many areas are compliant with PL 84-99 and Bulletin 192-82. The District continues to rehabilitate and maintain the levees as funds permit.

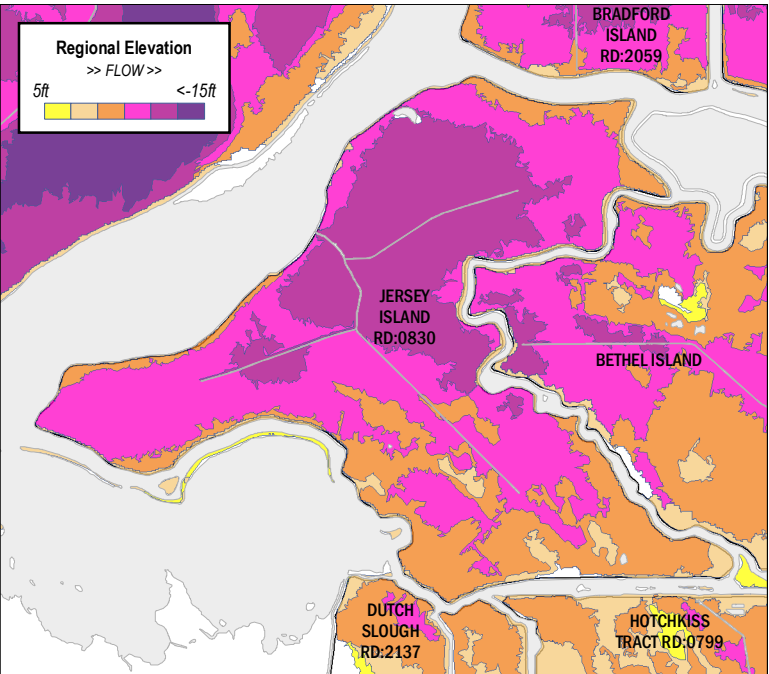
J12 - IRON HOUSE SANITARY DISTRICT FACILITIES

The Ironhouse Sanitary District (ISD) has a headquarters area on the north end of the island, with several structures in the vicinity. ISD also has an effluent pipeline that crosses the island and discharges into the San Joaquin River.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

J1 - HIGH WATER EVENT

Multiple high water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Vulnerable area approx.. 5,000 FT. Muscle wall or temporary earthen levee is recommended.

ACTIONS

The district maintains stockpiles of riprap on the island and has equipment available to perform levee maintenance and repairs. 20 cubic yards of sand is stored under the barn at headquarters. If a storm event is predicted, 6 cubic yards is placed in a dump truck so it is mobile. Muscle Wall Material Required: 5000 feet of temporary levee will require approximately 834 segments of muscle wall, 8340 sandbags, and 4170 cubic feet of sand. OR Temporary Earthen Levee Material Required: 5000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 100 rolls of 10 mil plastic sheeting, 1500 sandbags, and 225 cubic yards of fill. Approximately 27.8 cubic yards of fill for sand bags and 197.2 cubic yards of fill for visqueen fill.

J2 - FAILURE OF SAN JOAQUIN RIVER LEVEE ON RD 0830 (JERSEY ISLAND)

This scenario will lead to flooding of Jersey Island (RD 0830) in approximately 6-7 hours.

ACTIONS

1. Prepare to floodfight District Headquarters.
2. Shut down natural gas well heads at north end of island.
3. Shut down natural gas well heads at south end of island.

J3 - FAILURE OF TAYLOR SLOUGH LEVEE ON RD 0830 (JERSEY ISLAND)

This scenario will lead to flooding of Jersey Island (RD 0830) in approximately 10 hours.

ACTIONS

1. Prepare to floodfight District Headquarters.
2. Shut down natural gas well heads at north end of island.
3. Shut down natural gas well heads at south end of island.

C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

FLOOD FIGHT LABOR

Labor Ready Sacramento
916.374.9501

Labor Ready Concord
925.827.2352

Labor Ready Oakland
510.981.8226

REPAIR CONTRACTORS

Dutra Group

160 River Rd, Rio
Vista, CA
707.374.5127

Teichert Construction

24207 County Rd
100A, Davis, CA
530.406.4200

Teichert Construction

4401 Duluth Ave,
Roseville, CA
916.645.4800

Teichert Corporate Office

3500 American River
Dr, Sacramento, CA
916.484.3011

MATERIALS SUPPLIERS

Dutra Materials

615 River Rd, Rio Vista, CA
707.374.6964

Teichert Aggregates

4249 Hammonton Smartville
Rd, Marysville, CA
530.743.6111

Teichert Aggregates

8760 Kiefer Blvd, Sacramento,
CA
916.386.6905

Dutra Materials

1000 Point San Pedro Rd, San
Rafael, CA
415.459.7740

Teichert Aggregates

3331 Walnut Ave, Marysville,
CA
530.749.1230

Teichert Aggregates

35030 County Rd 20,
Woodland, CA
530.661.4290

Syar Industries

16560 County Rd 89, Esparto,
CA
530.787.2020

Teichert Aggregates

3417 Grant Line Rd, Rancho
Cordova, CA
916.351.0123

Teichert Ready Mix

8950 Cal Center Dr, #165,
Sacramento, CA
916.361.5000

Syar Industries

885 Lake Herman Rd, Vallejo,
CA
707.643.3261

Teichert Aggregates

13333 White Rock Rd, Rancho
Cordova, CA
916.985.2052

LOCAL SUPPLY PROVIDERS

Ace Hardware

Antioch
501 Sunset Dr, Antioch, CA
925.757.2500

Ace Hardware

Pittsburg
125 E Leland Rd, Pittsburg, CA
925.432.6089

Home Depot

Brentwood
5631 Lone Tree Way,
Brentwood, CA
925.513.6060

Ace Hardware

Brentwood
8900 Brentwood Blvd, Ste J,
Brentwood, CA
925.634.3201

Lowe's

Antioch
1951 Auto Center Dr, Antioch,
CA
925.756.0370

Home Depot

Pittsburg
2300 N Park Blvd, Pittsburg,
CA
925.473.1900

Ace Hardware

Oakley
305 5th St, Oakley, CA
925.625.2449

Lowe's

Antioch
5503 Lone Tree Way, Antioch,
CA
925.779.6060

Jersey Island

RD 830

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

FLOOD CONTINGENCY OPTIONS

D3 F Flood Contingency Option

D2 S Special Flood Consideration

LEVEE INFORMATION

1000-Foot Levee Stationing

Levee Centerline
Tide Gate
Levee Access Point
Agricultural Return Drain/Siphon
Levee Crossing

RESPONSE INFORMATION

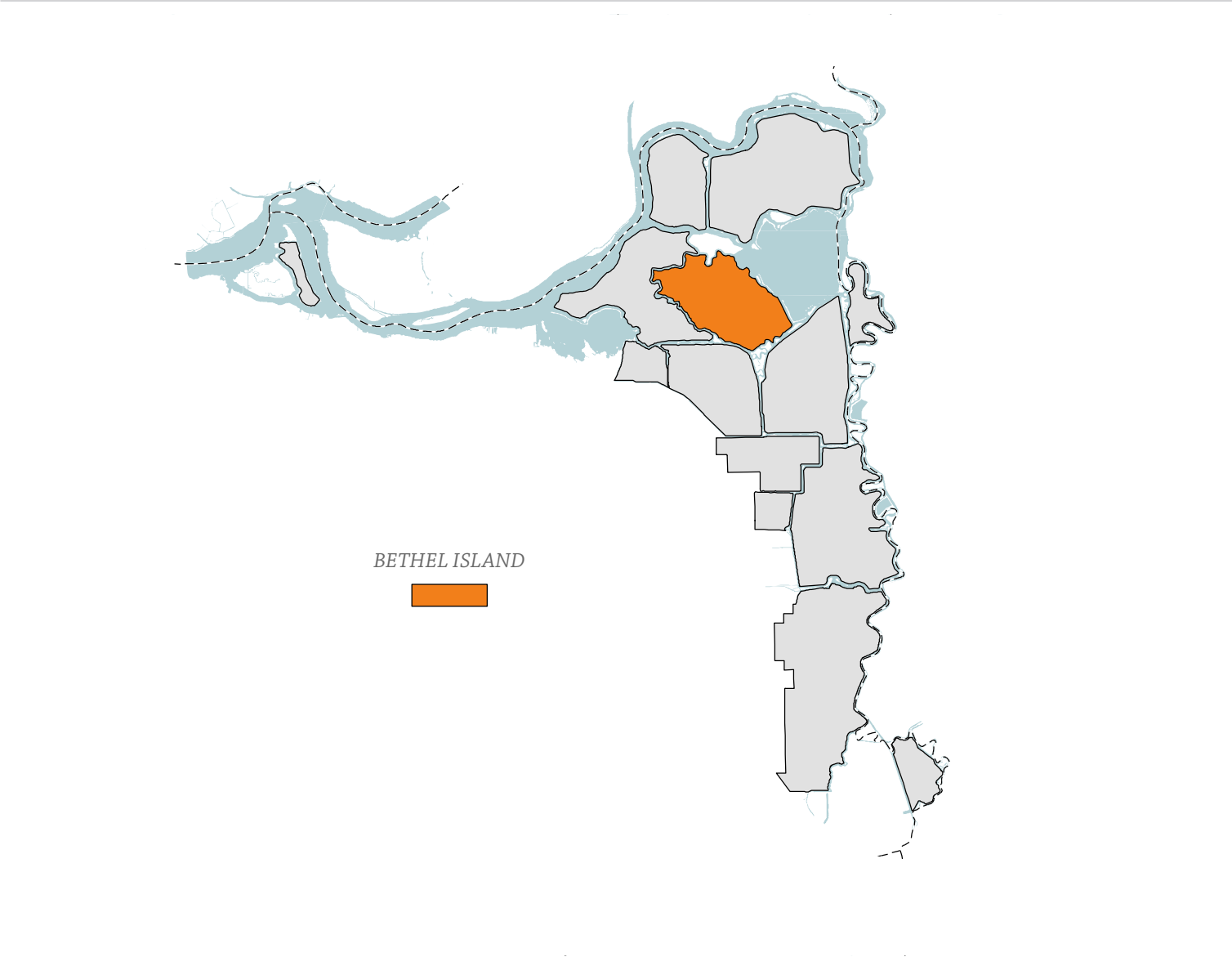
T_r Structure
T (type) [A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]
Boat Landing
Supply Delivery Point
Field Stockpile
Flood Fight Material
Helispot
Supply Staging
Command Post
Command Post Secondary
Pump Station
Pump Station Agricultural

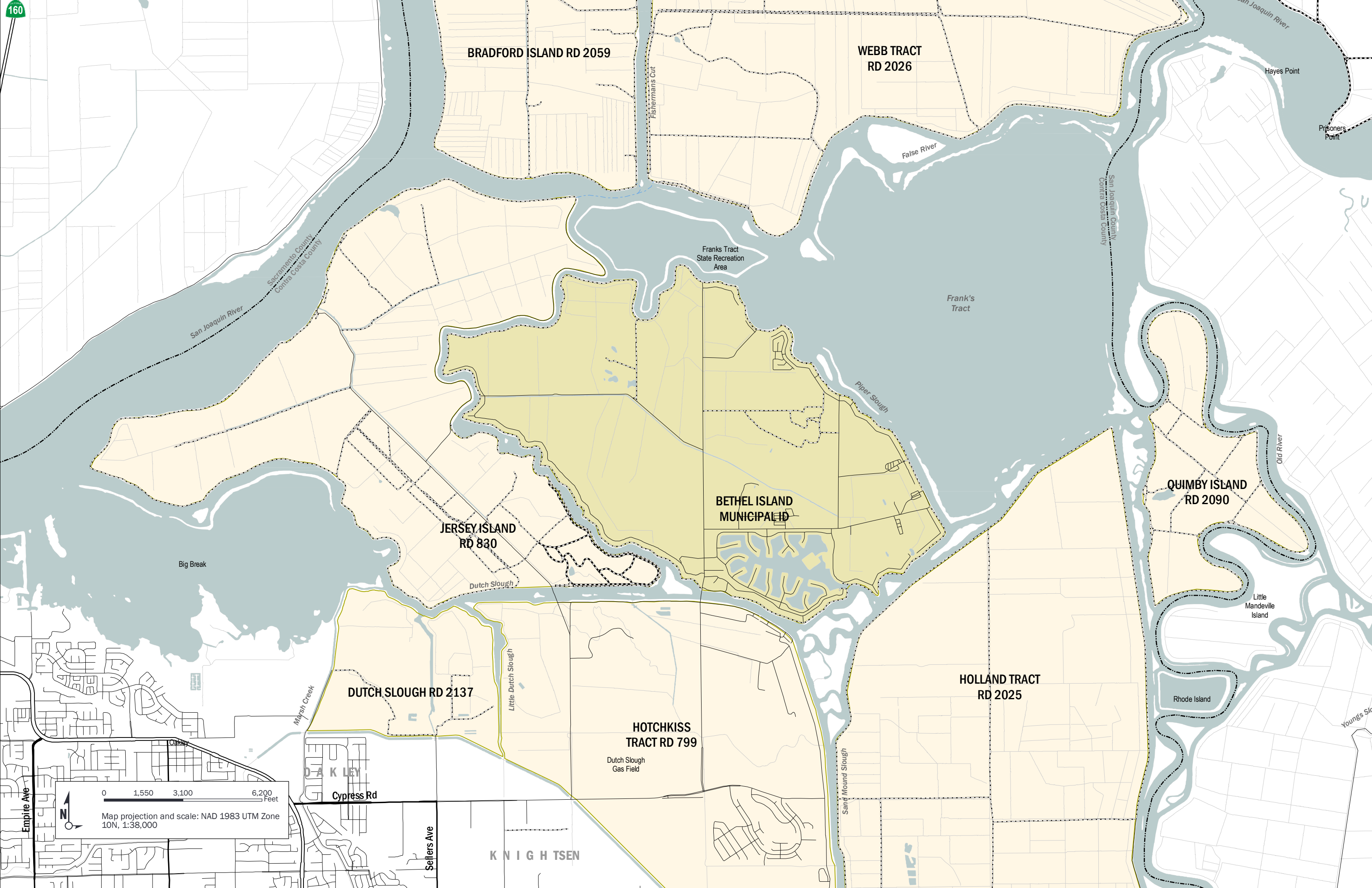
REFERENCE INFORMATION

Ferry
Communication Facility
Potable Water Facility
Waster Water Facility
Solid Waste Facility
Natural Gas Facility
Hazardous Material
UG - Underground Power Line
Transmission Line
UG - Underground Gas Line
County Boundary

Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:23,200

Bethel Island





BRADFORD ISLAND RD 2059

WEBB TRACT
RD 2026

San Joaquin River

Sacramento County
Contra Costa County

Fishermans Cut

False River

Franks Tract
State Recreation
Area

Frank's
Tract

Piper Slough

San Joaquin County
Contra Costa County

Hayes Point

Prisoners
Point

Old River

QUIMBY ISLAND
RD 2090

Little
Mandeville
Island

Rhode Island

Youngs Slough

JERSEY ISLAND
RD 830

BETHEL ISLAND
MUNICIPAL ID

Dutch Slough

Little Dutch Slough

DUTCH SLOUGH RD 2137

HOTCHKISS
TRACT RD 799

Dutch Slough
Gas Field

HOLLAND TRACT
RD 2025

Big Break

Marsh Creek

Oakley

OAKLEY

Cypress Rd

Sellers Ave

K N I G H T S E N

160

Empire Ave

Map projection and scale: NAD 1983 UTM Zone 10N, 1:38,000

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

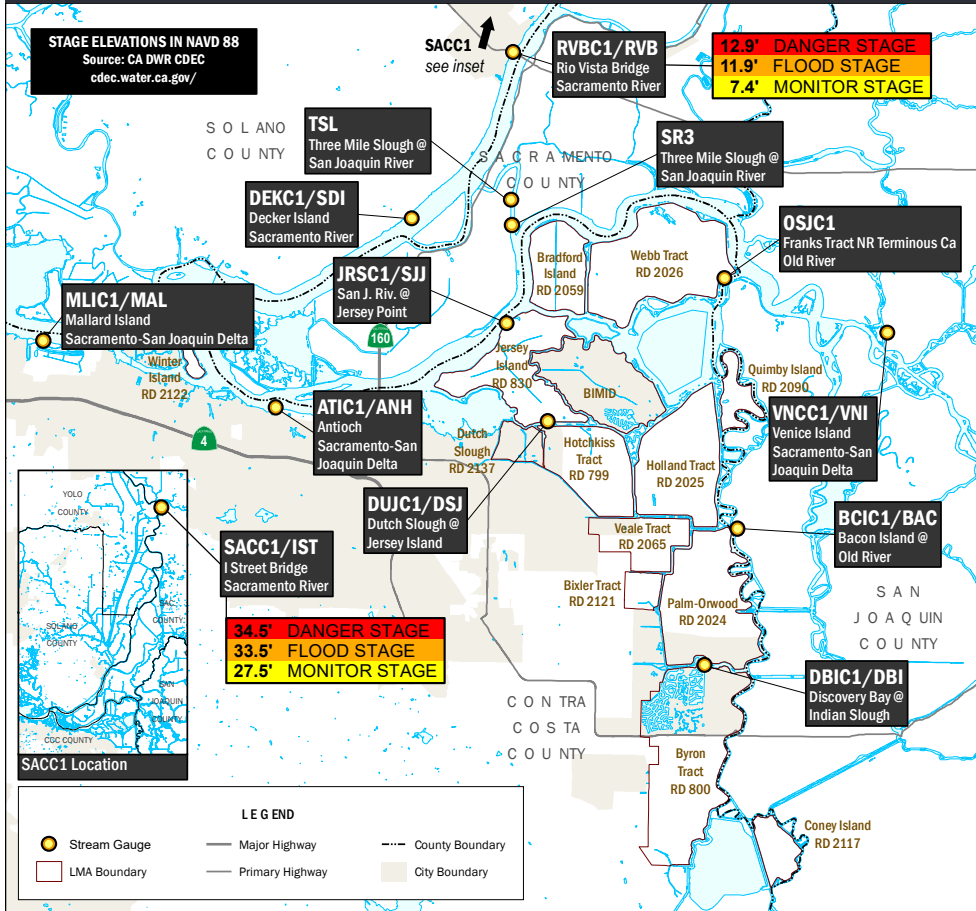
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|-------------------------------------|--|---|
| SACC1/IST I Street Bridge | RVBC1/RVB Rio Vista Bridge | DEKC1 Decker Island |
| MLIC1/MAL Mallard Island | JRSC1/SJJ SJ Riv. @ Jersey Pt | OSJC1 Franks Tract, Terminous |
| ATIC1/ANH Antioch | DUJC1/DSJ Dutch Slough @ Jersey Island | VNCC1/VNI Venice Island |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

LARGE EQUIPMENT STAGING LOCATION

Heavy equipment - back hoe, excavator, dozers, loaders, graders, etc
38°01'48.55758960"N, 121°37'35.97933720"W

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

SUPPLY DELIVERY POINT

Designated supply delivery point in yard along Bethel Island Road, central island.
38°01'54.51710520"N, 121°38'22.71482160"W

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

FILL/EARTHEN MATERIAL STOCKPILE

Sand and Rock Material
38°01'48.57424680"N, 121°37'36.05468160"W

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

CORPS YARD

Equipment Maintenance Yard
38°00'52.82613720"N, 121°38'19.19744160"W

121°37'20.71887240"W

FLOOD FIGHT MATERIAL

Container with sand bags & flood fight equipment (stacks twine, shovels, flashlight, etc)
38°01'48.65090160"N, 121°37'36.06980880"W

FLOOD FIGHT MATERIAL

Sand bag, shovels public distribution location
38°01'47.77613040"N,

FLOOD FIGHT MATERIAL

Sand, Flood Fight Materials Distribution Location
38°01'55.44544800"N, 121°38'24.83634840"W

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

| | | | | |
|---|--|---|--|--|
| EMERALD POINT MARINA Enf./Compliance Activity/ SPCC 3234 Stone Rd BETHEL ISLAND MUTUAL WATER CO Community Water System 38°00'52.25445"N, 121°38'16.12811"W E. CCC FIRE STATION 95 Enf./Compliance Activity 3045 Ranch Ln | 18100 RB55 Leaking Underground Storage Tank - Arra 3303 Gateway Rd FLAMINGO MOBILE MANOR Community Water System 38°01'13.10206"N, 121°36'48.13737"W STEVE HANCOCK TRUCKING Transporter 4295 Gateway Rd | FRANKS MARINA Community Water System 38°01'24.68383"N, 121°36'42.49581"W LUNDBORG LANDING Community Water System 38°01'24.68383"N, 121°36'42.49581"W RIGGS ENTERPRISES INC Formal Enforcement Action 1440 Sugar Barge Rd | DELTA IMAGING SERVICE Hazardous Waste Biennial Reporter 1922 Taylor Rd PLEASANTIMES MUTUAL WATER CO Community Water System 38°01'42.75617"N, 121°36'54.93887"W | MARINER COVE MARINA Enf./Compliance Activity/ SPCC 1200 Taylor Rd BETHEL HARBOR LTD Enf./Compliance Activity/ SPCC 3405 Harbor Rd |
|---|--|---|--|--|

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.313.2000

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.313.2000

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
800.952.5530

CALTRANS

Evacuation/Bridge Support

916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

DUTCH SLOUGH (RD 2137)

Nate Hershey
916.456.4400

PALM-ORWOOD TRACT (RD 2024)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

HOLLAND TRACT (RD 2025)

David A. Forkel
925.932.0251
Bus. 925.693.9977
Bus. Cell

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

JERSEY ISLAND (RD 830)

Chad Davidson 925.625.2279
ER Contact 925.727.2938

WEBB TRACT (RD 2026)

Al Warren Hoslett
209.943.5551, Bus.

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300

Bethel Island

The symbology presented in the legend below is global to the project area. Some symbols may not be present on map.

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

EVACUATION

Rally Point

EVACUATION ROUTES

Major Road Local Road

LEVEE INFORMATION

1000-Foot Levee Stationing
Levee Centerline
Tide Gate
Levee Access Point
Historic Levee Breach
Levee Erosion
Levee Seepage
Agricultural Return Drain/Siphon
Levee Crossing

RESPONSE INFORMATION

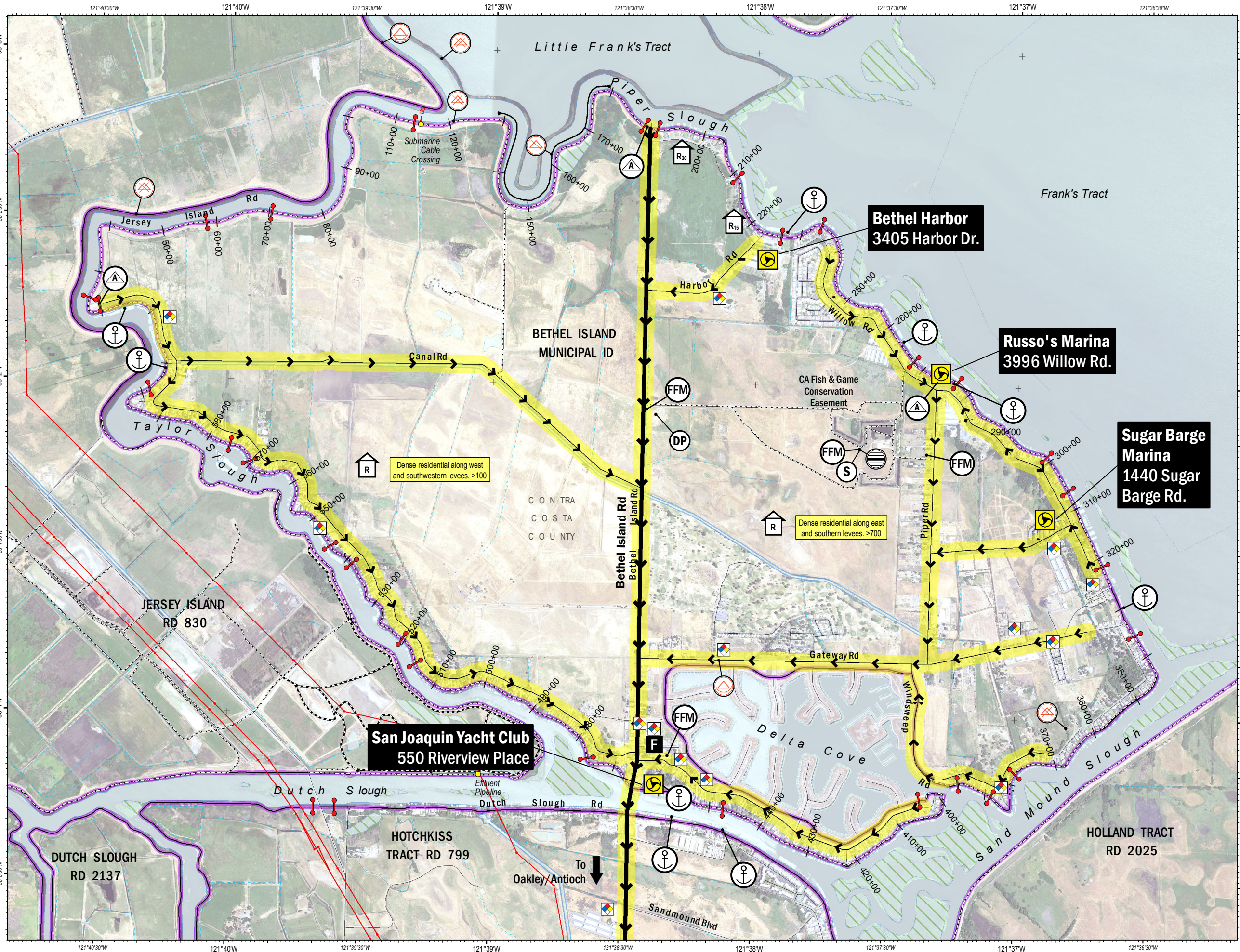
Structure
T (type)
[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]
Boat Landing
Supply Delivery Point
Field Stockpile
Flood Fight Material
Supply Staging

REFERENCE INFORMATION

Fire Station
Home Care
Ferry
Hazardous Material
School
Ag. Worker Camp
Dam
Underground Power Line
Transmission Line
Underground Gas Line
County Boundary

0 750 1,500 3,000 Feet

Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:20,300



FLOOD CONTINGENCY PLANNING INFORMATION

A.1. SPECIAL FLOOD CONSIDERATIONS

B1 - EVACUATION CONSIDERATIONS
Bethel Island elevations vary -7 to -15 feet below sea level. Surrounded by 11.5 miles of earthen levee that keeps the Taylor, Piper, Dutch and Sandmound Slough waters out of the island. The middle of the island is generally lower than the surrounding lands toward the levees. Structures or residents in the middle of the island will be inundated first. Structures in the middle of the island vary in height depending upon flood resistant construction methods. Some homes are constructed on elevated pier structures 1 FT above the base flood elevation, which above average sea level.

Depending on time to inundation some residents may choose to shelter in place in flood resistant (elevated structures) (rally points) as a last resort. Residents have been provided emergency indicators for those requiring rescues from structures in the middle of the island.

B2 - BIMID POPULATIONS
Bethel Island has a population of about 2,100 which is the most populated island in the Delta. The total area is about 3,500 acres, mostly rural-agricultural, but with high-density residential development along 2/3 of the island's perimeter.

B3 - EGRESS
Bethel Island Bridge provides the only egress on and off the island for motor vehicles.

B4 - CAR-LESS POPULATION
The primary mode of transportation in an evacuation will be privately owned vehicles. However, some individuals on Bethel Island may not own a car or, for whatever reason, cannot drive or in an emergency may not choose to drive.

B5 - EVACUATION INITIATION
If there is imminent threat of a failure of the BIMID levees or an actual breach occurs, the District is responsible for calling 911 to initiate the evacuation of the residents of Bethel Island under the direction of the Sheriff's Office.

B6 - PUBLIC ALERT
The Community Warning System (CWS) is a comprehensive, integrated system for alerting people in Contra Costa County to imminent threats to their life or health. CWS capabilities include:
-Sirens near major industrial facilities and in other special safety zones
-Countywide telephone notification system
-NOAA Weather Radio
-Radio, TV and cable via the federal Emergency Alert System (EAS)
-Cell phone notification service
-Facebook: CoCoCWS
-NEW Twitter alerts ~ Follow @CoCoCWS

B7 - NOTIFICATION
In the event of a Bethel Island levee break or breach, the Bethel Island siren system will be activated by a representative of BIMID. In conjunction with the activation of the siren system, the Contra Costa County Telephone Emergency Notification System (TENS) will be activated and the following message will go out to every telephone with a billing address in the 94511-zip code:
This is a message from the Contra Costa County Sheriff's Office. There is an Immediate Evacuation of Bethel Island. Due to a levee breach _at LOCATION if verified by BIMID_, an immediate evacuation has been ordered for all residents on Bethel Island. Do not attempt to drive off the island or onto the levee, as emergency vehicles need to get through. Move onto

the levee and walk to the nearest evacuation point. If able, help a neighbor in need of evacuation assistance. Take only those essential items you have ready and can carry with you. Household pets must be in a carrier or on a leash. Stay off the phone unless you need to report a life-threatening emergency at your location. For more information tune to local radio station 740 am, marine radio station 16, or television.

B8 - SPECIAL TRANSPORTATION NEEDS
Residents with special transportation and evacuation needs exist in this area and should be coordinated through the county Sheriff's Department and OES.

B9 - RALLY POINTS
There is a total of four (4) rally points, all with signs placed at the street entrance to the following: Bethel Harbor, Russos Marina, Sugar Barge Marina, and San Joaquin Yacht Club. These locations serve as safe havens that accommodate evacuees waiting further instructions for sheltering and provide protection from inclement weather.

B10 - MOBILE HOME PARKS
Many mobile home parks and elderly on Bethel Island. The County Sheriff's Office will identify and account for these individuals in coordination with BIMID Officials per the Sheriff's Standard Operating Procedures.

B11 - HORSE SHOE BEND SLOUGHING
A January 2006 storm event caused levee sloughing in Horseshoe Bend. Horseshoe Bend will be undergoing levee improvements to Delta Stewardship council (CALFED) Levee Stability Program requirements.

B12 - WIND DRIVEN WAVES
Wind-driven waves can be significant along the north shore.

B13 - BOAT WAKES
Boat wakes are a source of year-round erosion. Boat wakes are generally more frequent during summer months.

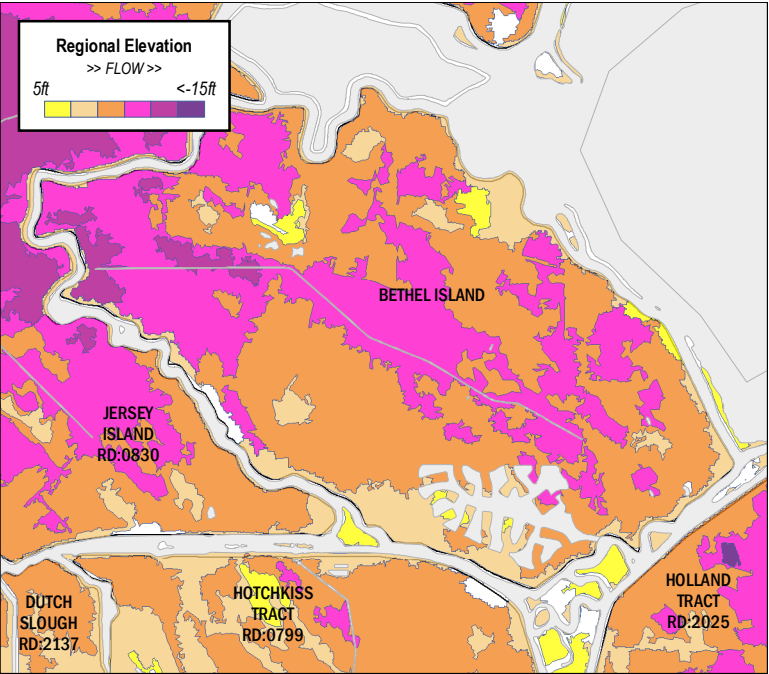
B14 - LEVEE CERTIFICATION
The levees have no other official certification however, all perimeter levees meet the criteria for HMP (min. 1 foot above the 100-year Base Flood Elevation, 16-foot crown, and 2:1 landside slope) and most of the levees meet Delta-specific PL 84-99 criteria.

B15 - DISEASE CONTROL
There are cattle on the island always. During a flood, many head of cattle could become trapped and/or perish. Animal carcass management is a concern for disease control. Coordinate with the California Department of Food and Agriculture through the local county Office of Emergency Services for disposal methods.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

B1 - WIND WAVES
Wind waves 1.5 feet in height could occur at this location. Wind waves causing erosion will lead to levee failure if not addressed for long periods of time; protection area approx. 300 feet.

- ACTIONS**
1. Protect area exposed to wind waves with envelope-style wrap.
- Wave Wash Protection Material Required:
300 feet of envelope wave wash will require approximately 6 rolls of 10 mil plastic sheeting, 90 sandbags, 45 cubic feet of sand, 6 rolls of twine, 30 plastic buttons or rocks, and 60 [1-inch x 3-inch x 2-foot] stakes.

B2 - LOCAL HIGH WATER EVENT
Multiple high water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. East side of BIMID levee system may be lower than regional high water event. Vulnerable area approx. 5,000 feet. Muscle wall or temporary earthen levee is recommended.

- ACTIONS**
1. Close control gate at intake slough.
 2. Activate workforce for levee patrols.
 3. Move or evacuate cattle population.
 4. Prepare resources for temporary earthen levee or muscle wall.
- Muscle Wall Material Required:
5,000 feet of temporary levee will require approximately 834 segments of muscle wall, 8340 sandbags, and 4,170 cubic feet of sand.
Or:
Temporary Earthen Levee Material Required:
2-foot-high by 4-foot-wide earthen berm. 5,000 feet of levee will require approximately 220 cubic yards of material, 1,500 sandbags, 750 cubic feet of sand, and 50 rolls of 10 mil plastic sheeting.

C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

| FLOOD FIGHT LABOR | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |

REPAIR CONTRACTORS

| | | | |
|--|---|--|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |
|--|---|--|---|

MATERIALS SUPPLIERS

| | | |
|--|---|---|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
|--|---|---|

| | | |
|--|--|---|
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |
|--|--|---|

| | | |
|--|---|--|
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |
|--|---|--|

| | | |
|--|--|--|
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 | |
|--|--|--|

LOCAL SUPPLY PROVIDERS

| | | |
|---|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
|---|---|--|

| | | |
|--|---|--|
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |
|--|---|--|

| | | |
|--|--|--|
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 | |
|--|--|--|

Bethel Island

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

FLOOD CONTINGENCY OPTIONS

D3 Flood Contingency Option

D2 Special Flood Consideration

LEVEE INFORMATION

1000-Foot Levee Stationing

Levee Centerline Tide Gate Agricultural Return Drain/Siphon Levee Access Point Levee Crossing

RESPONSE INFORMATION

Structure T (type) [A - Agricultural, R - Residential, S - Seasonal, U - Unknown] # (count) - [Approx. Structure Count]

Boat Landing Command Post Supply Delivery Point Command Post Secondary Field Stockpile Pump Station Flood Fight Material Pump Station Agricultural Helispot Supply Staging

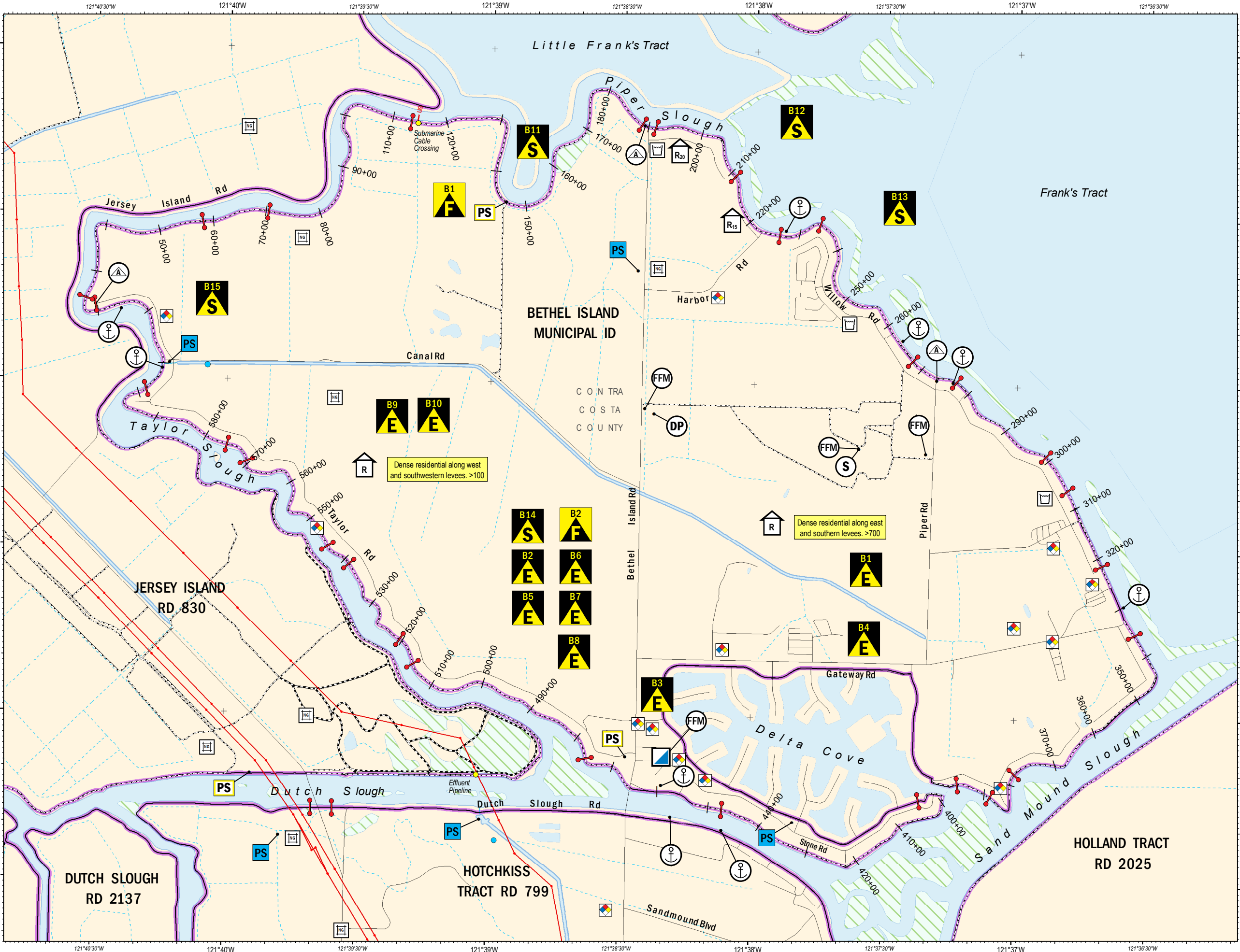
REFERENCE INFORMATION

Ferry Communication Facility Potable Water Facility Waster Water Facility Solid Waste Facility Natural Gas Facility Hazardous Material

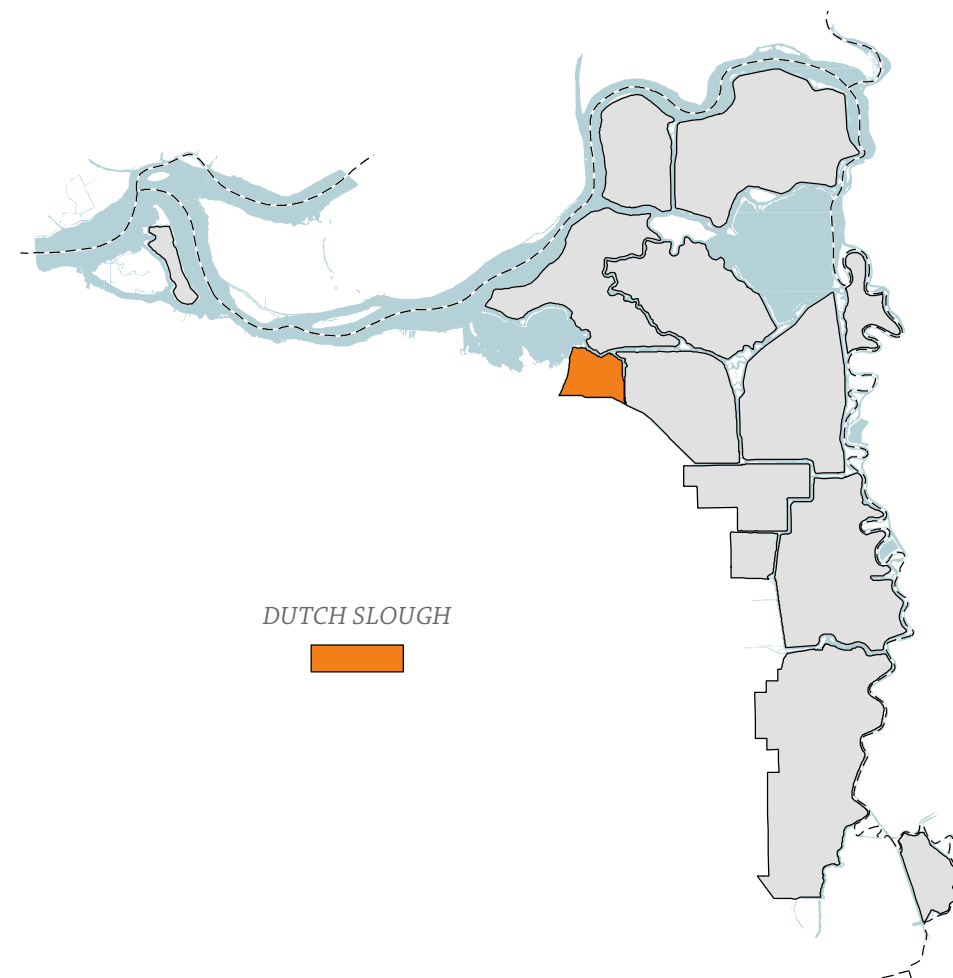
UG Underground Power Line Transmission Line UG Underground Gas Line County Boundary

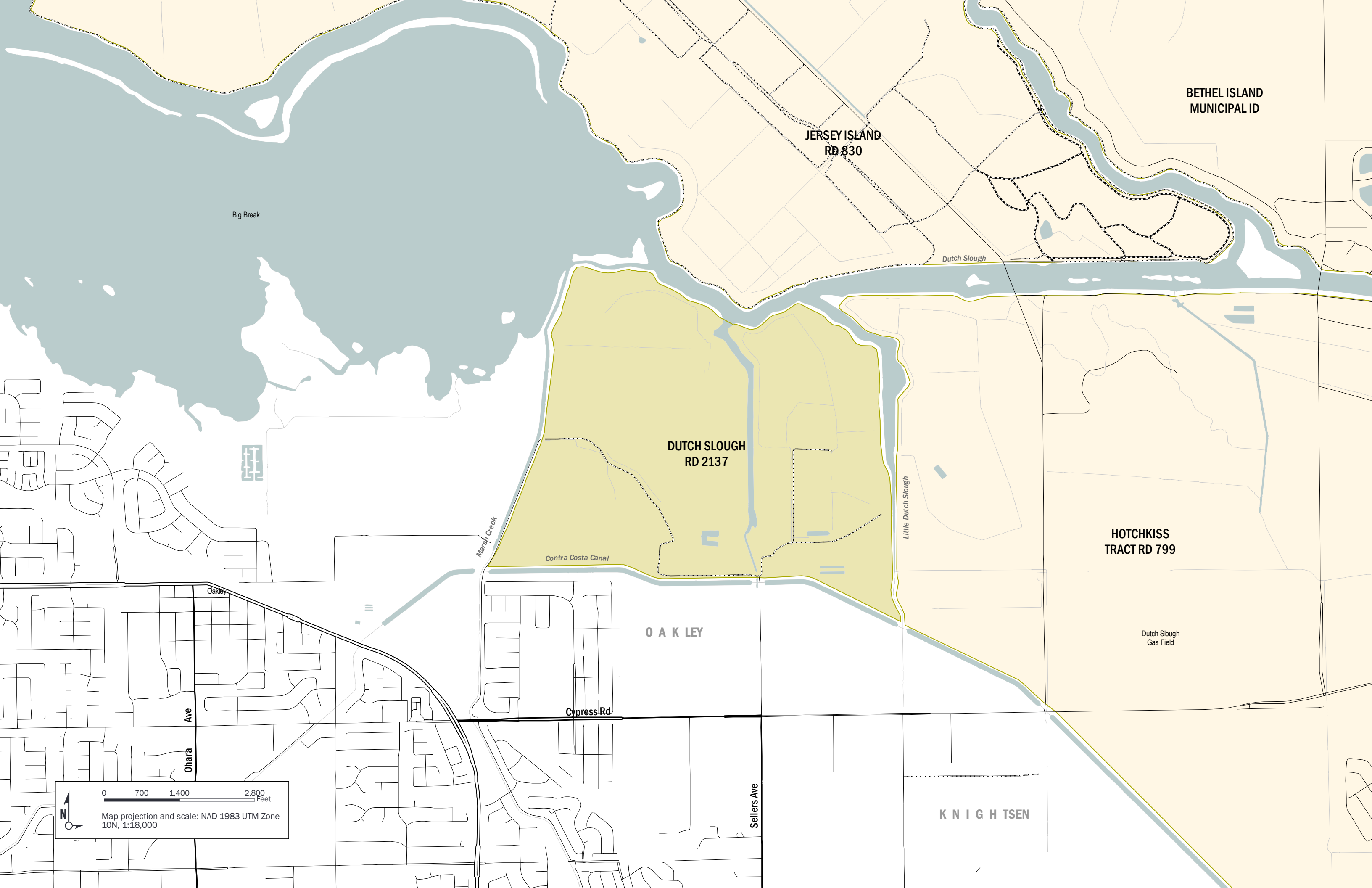
0 750 1,500 3,000 Feet

Map projection and scale: NAD 1983 StatePlane California III FIPS 0403 Feet, 1:20,300



Dutch Slough.....RD 2137





BETHEL ISLAND
MUNICIPAL ID

JERSEY ISLAND
RD 830

Big Break

Dutch Slough

DUTCH SLOUGH
RD 2137

Contra Costa Canal

Little Dutch Slough

HOTCHKISS
TRACT RD 799

Dutch Slough
Gas Field

O A K LEY

Cypress Rd

Sellers Ave

K N I G H T S E N



0 700 1,400 2,800
Feet

Map projection and scale: NAD 1983 UTM Zone
10N, 1:18,000

Ohara
Ave

Oakley

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

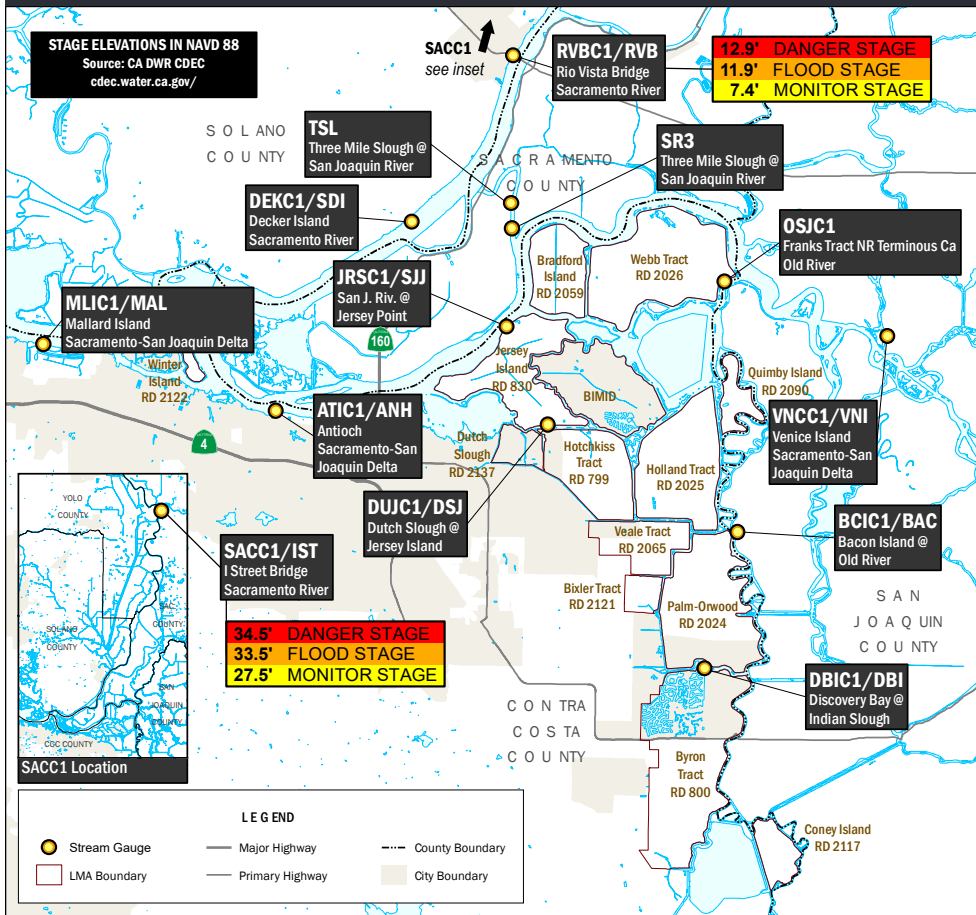
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|-------------------------------------|--|---|
| SACC1/IST I Street Bridge | RVBC1/RVB Rio Vista Bridge | DEKC1 Decker Island |
| MLIC1/MAL Mallard Island | JRSC1/SJJ SJ Riv. @ Jersey Pt | OSJC1 Franks Tract, Terminous |
| ATIC1/ANH Antioch | DUJC1/DSJ Dutch Slough @ Jersey Island | VNCC1/VNI Venice Island |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

FLOOD FIGHT STAGING

Materials for flood fighting can be staged under the open air barn inside the south gate.
37°59'53.19521880"N, 121°40'42.84131520"W

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

No Known Supply Delivery Points in Map Extent

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

EMERGENCY FILL

In an event where additional on-island fill material is needed, high ground is located on the South-West corner of the Emerson Parcel.
37°59'59.77314240"N, 121°41'30.56424000"W

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

No Known Flood Fight Materials in Map Extent

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

No Known HazMat Locations in Map Extent

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY OFFICE OF EMERGENCY SERVICES

CCC OES
925-228-5000, 24-HOUR

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.427.8562

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
916.574.2619

CALTRANS

Evacuation/Bridge Support
916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell

JERSEY ISLAND (RD 830)

Chad Davidson
925.625.2279
ER Contact
925.727.2938

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

DUTCH SLOUGH (RD 2137)

Nate Hershey
916.456.4400

PALM-ORWOOD TRACT (RD 2024)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

WEBB TRACT (RD 2026)

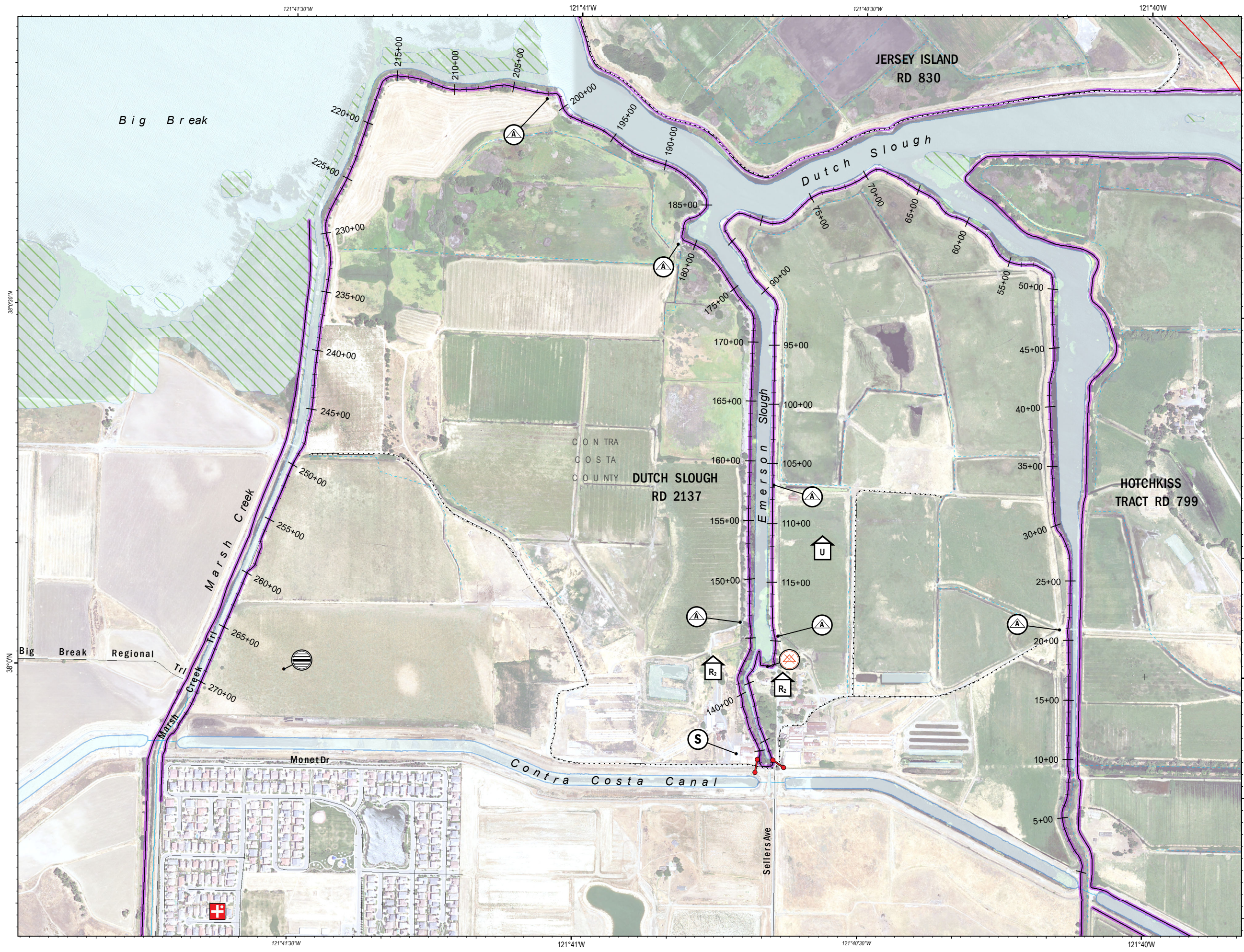
Al Warren Hoslett
209.943.5551, Bus.

HOLLAND TRACT (RD 2025)

David A. Forkel
925.932.0251
925.693.9977

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300



Dutch Slough

RD 2137

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

LEVEE INFORMATION

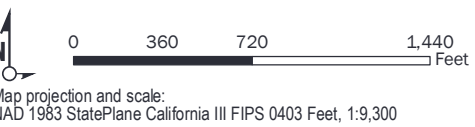
- 1000-Foot Levee Stationing
- Levee Centerline
- Tide Gate
 - Levee Access Point
 - Historic Levee Breach
 - Levee Erosion
 - Levee Seepage
 - Agricultural Return Drain/Siphon
 - Levee Crossing

RESPONSE INFORMATION

- Structure
- T (type) [A - Agricultural; R - Residential; S - Seasonal; U - Unknown] # (count) - [Approx. Structure Count]
- Boat Landing
 - Supply Delivery Point
 - Field Stockpile
 - Flood Fight Material
 - Supply Staging

REFERENCE INFORMATION

- Fire Station
- Home Care
- Ferry
- Hazardous Material
- School
- Ag. Worker Camp
- Dam
- Underground Power Line
- Transmission Line
- Underground Gas Line
- County Boundary



FLOOD CONTINGENCY PLANNING INFORMATION

A.1. SPECIAL FLOOD CONSIDERATIONS

D1 - PUMP STATION 1

Located near station 107+00. This discharge pump may be utilized during a major flood event.

D2 - PUMP STATION 4

Located near station 181+00. This discharge pump may be utilized during a major flood event.

D3 - CYPRESS GROVE DETENTION BASIN

The Cypress Grove Detention Basin operations manual addresses all aspects of the stormwater pond’s maintenance, such as desilting, weed and trash abatement, excessive vegetation growth at the outfall/low flow channel, maintenance of inlet and outlet structures, embankment maintenance, acceptable chemical use and basin access. If the operations manual is not adhered to, the detention basin could overtop, causing flooding in the adjacent neighborhood and the nearby Contra Costa Canal. Consult the City of Oakley and/or the Maintenance POC for Cypress Grove properties.

D4 - DUTCH SLOUGH TIDAL

Dutch Slough restoration plan will degrade levees to restore tidal action on RD 2137 Dutch Slough.

D5 - EVACUATION CONSIDERATIONS

Primary exit route near station 133+50 - exit along Sellers Avenue towards East Cypress Road. Secondary evacuation routes include station 0+00 (southeast) south towards East Cypress Road; Northwest over pedestrian bridge across Marsh Creek near station 250+00; and Southwest at bike trail using levee crown/trail road near station 270+00.

D6 - GENERAL FLOOD THREAT

Dutch Slough is vulnerable to flooding from a number of sources, including excessive runoff in the mountain regions and related reservoir releases. The flooding threat is predominantly tidal, with some local runoff that can influence conditions. Drainage from the south discharges into the south ends of Emerson Slough and Little Dutch Slough. On the west side, Marsh Creek flows north into Dutch Slough. Marsh Creek and Dutch Slough could pose a riverine flooding threat.

D7 - FETCH / WAVE RUN UP

The wave fetch is relatively short and is generally not a concern over much of the District. The northwest corner of the eastern tract has a wave fetch of 1.9 miles across Big Break and up Dutch Slough, from 303 degrees. The northwest corner of the western tract has a wave fetch of 4.4 miles across Big Break, from 286 degrees. Channel widths generally vary from 50 to 480 feet. The levees are mostly armored with riprap and concrete debris.

D8 - LEVEE CONDITIONS

There is no certification status. The levee crown generally meets the height requirements of the Hazard Mitigation Plan (HMP) configuration. As part of the Dutch Slough project, the levees will be rehabilitated to meet or exceed the HMP geometry.

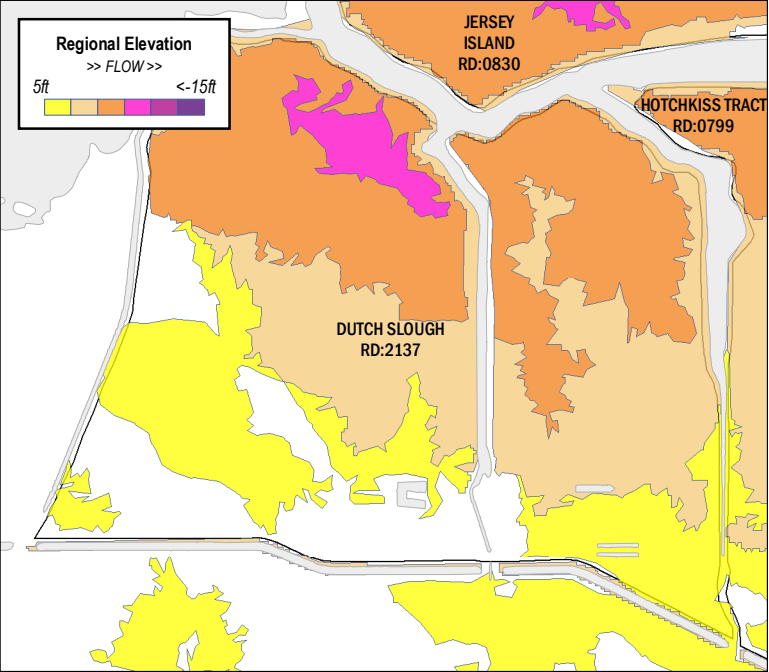
D9 - EVACUATION CONSIDERATIONS

A residence at the south end of Emerson Slough is rented periodically, along with several legacy farming structures. Population ranges from 0 to 5.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

D1 - HIGH WATER EVENT

Multiple high water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Vulnerable area approx.. 5,000 FT. Muscle wall or temporary earthen levee is recommended.

ACTIONS

Gather flood fight materials and equipment and stockpile them in the staging area.

- 1. Activate workforce for levee patrols.
- 2. Prepare resources for temporary earthen levee or muscle wall.

Muscle Wall Material Required:

5000 feet of temporary levee will require approximately 834 segments of muscle wall, 8340 sandbags, and 4170 cubic feet of sand.

OR

Temporary Earthen Levee Material Required:

5000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 100 rolls of 10 mil plastic sheeting, 1500 sandbags, and 225 cubic yards of fill.

Approximately 27.8 cubic yards of fill for sand bags and 197.2 cubic yards of fill for visqueen fill.

D2 - OVERTOPPING

Overtopping due to tide action or weather could occur along dutch slough.

ACTIONS

Gather flood fight materials and equipment and stockpile them in the staging area.

Temporary Earthen Levee Material Required:

4000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 80 rolls of 10 mil plastic sheeting, 1200 sandbags, and 180 cubic yards of fill.

Approximately 22.2 cubic yards of fill for sand bags and 157.8 cubic yards of fill for visqueen fill.

C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

FLOOD FIGHT LABOR

| | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |
|--|-------------------------------------|-------------------------------------|

REPAIR CONTRACTORS

| | | | |
|--|--|---|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |
|--|--|---|---|

MATERIALS SUPPLIERS

| | | |
|--|---|---|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
|--|---|---|

| | | |
|--|--|---|
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |
|--|--|---|

| | | |
|--|---|--|
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |
|--|---|--|

| | | |
|--|--|--|
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 | |
|--|--|--|

LOCAL SUPPLY PROVIDERS

| | | |
|---|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
|---|---|--|

| | | |
|--|---|--|
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |
|--|---|--|

| | | |
|--|--|--|
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 | |
|--|--|--|

Dutch Slough

RD 2137

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

FLOOD CONTINGENCY OPTIONS

D3 Flood Contingency Option D2 Special Flood Consideration

LEVEE INFORMATION

1000-Foot Levee Stationing
Levee Centerline
Tide Gate Agricultural Return Drain/Siphon
Levee Access Point Levee Crossing

RESPONSE INFORMATION

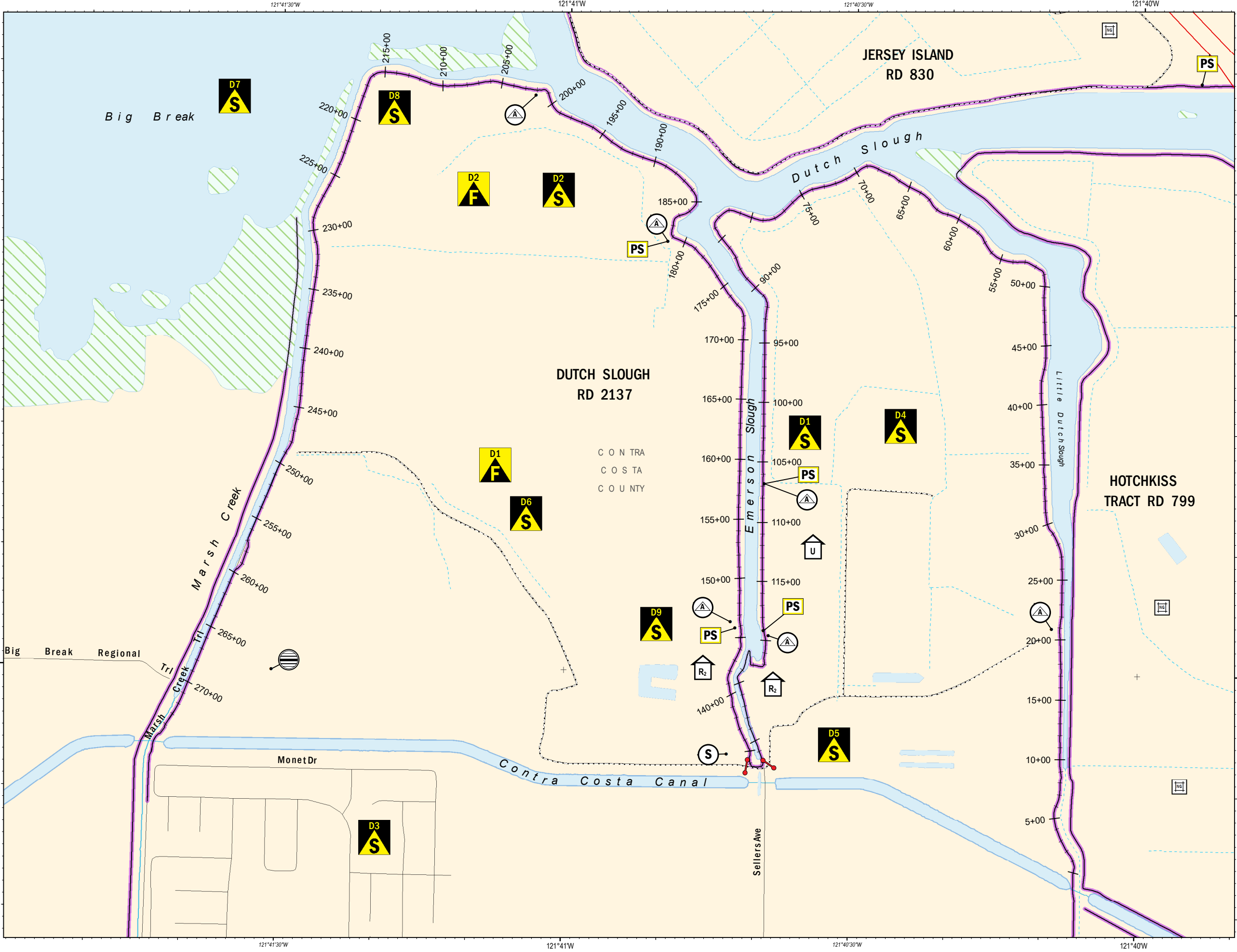
Structure T (type) [A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]
Boat Landing Command Post
Supply Delivery Point Command Post Secondary
Field Stockpile PS Pump Station
FFM Flood Fight Material PS Pump Station Agricultural
H Helispot
S Supply Staging

REFERENCE INFORMATION

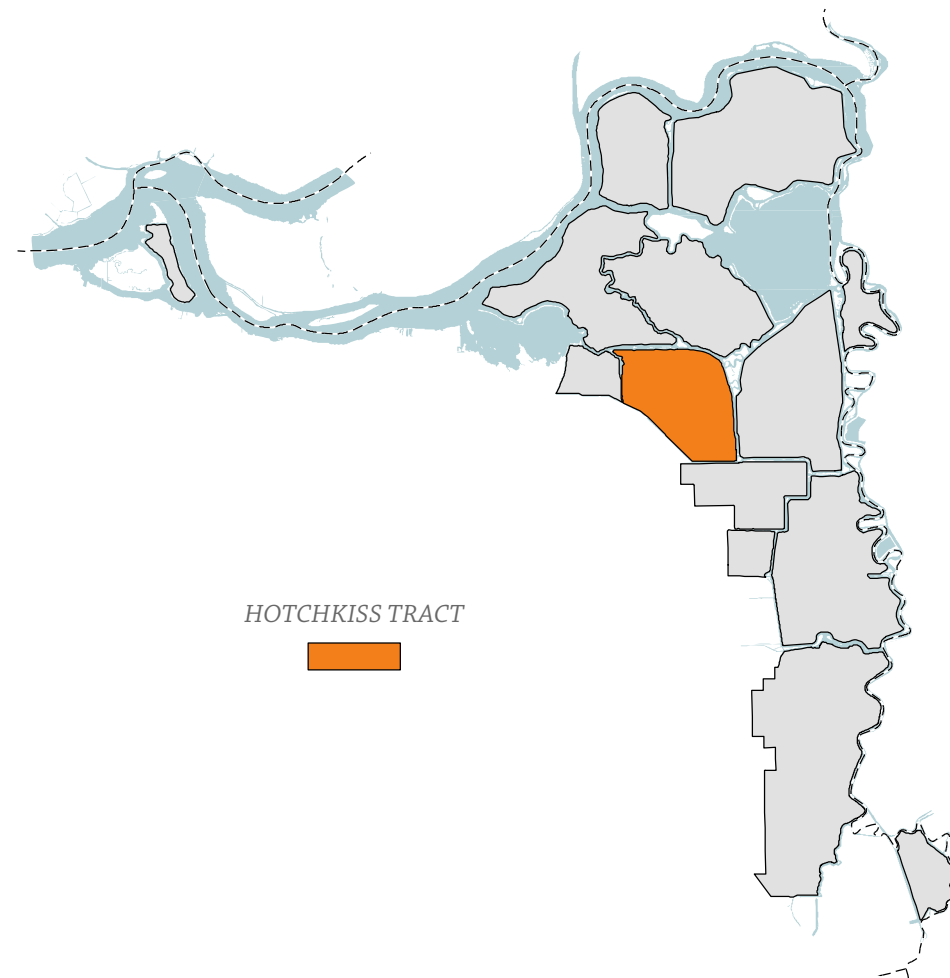
Ferry Communication Facility
Potable Water Facility Waster Water Facility
Solid Waste Facility Natural Gas Facility
Hazardous Material
UG Underground Power Line
Transmission Line
UG Underground Gas Line
County Boundary

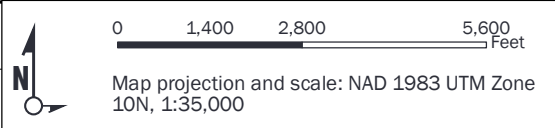
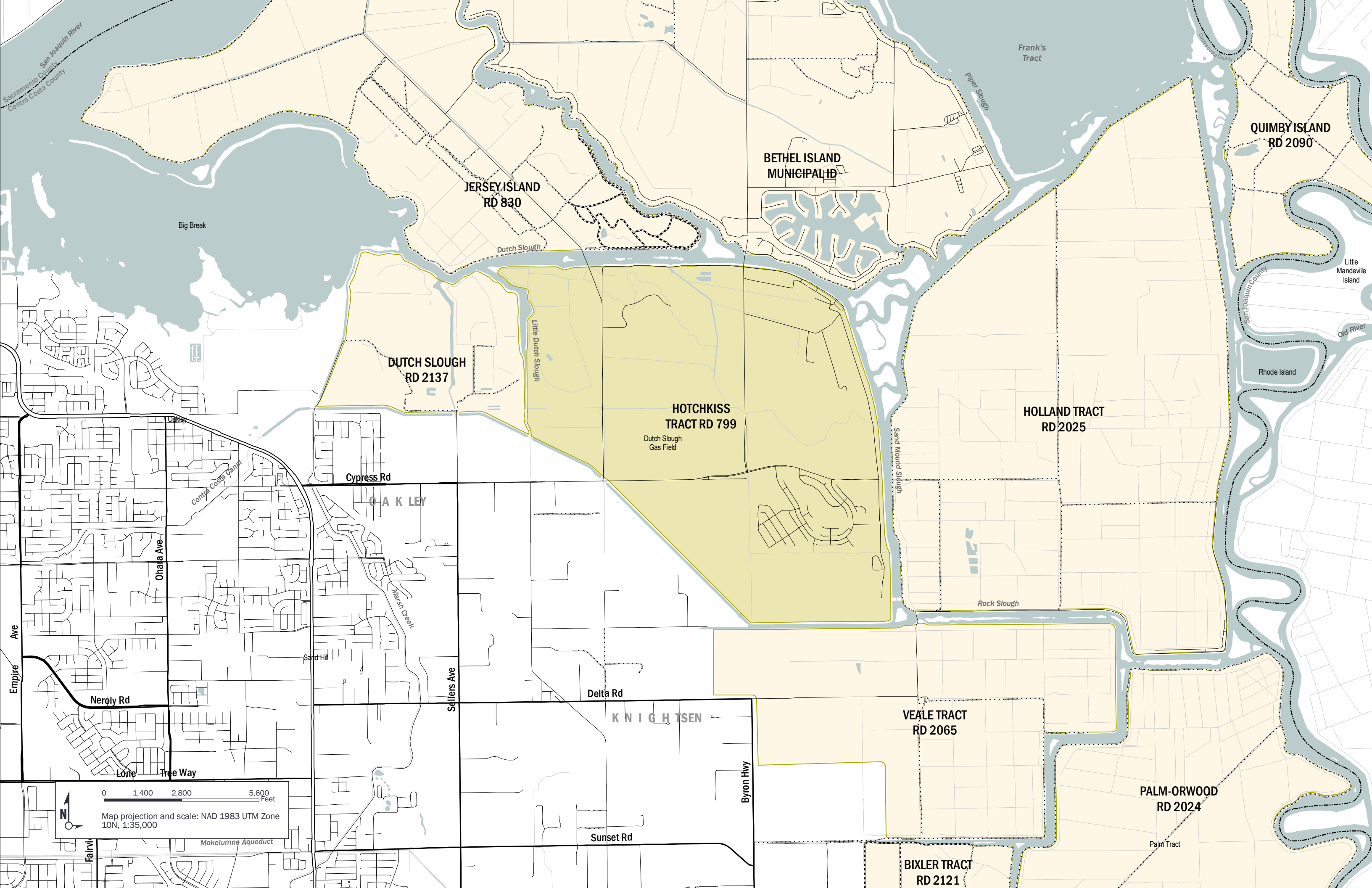
0 360 720 1,440 Feet

Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:9,300



Hotchkiss Tract..... RD 799





A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

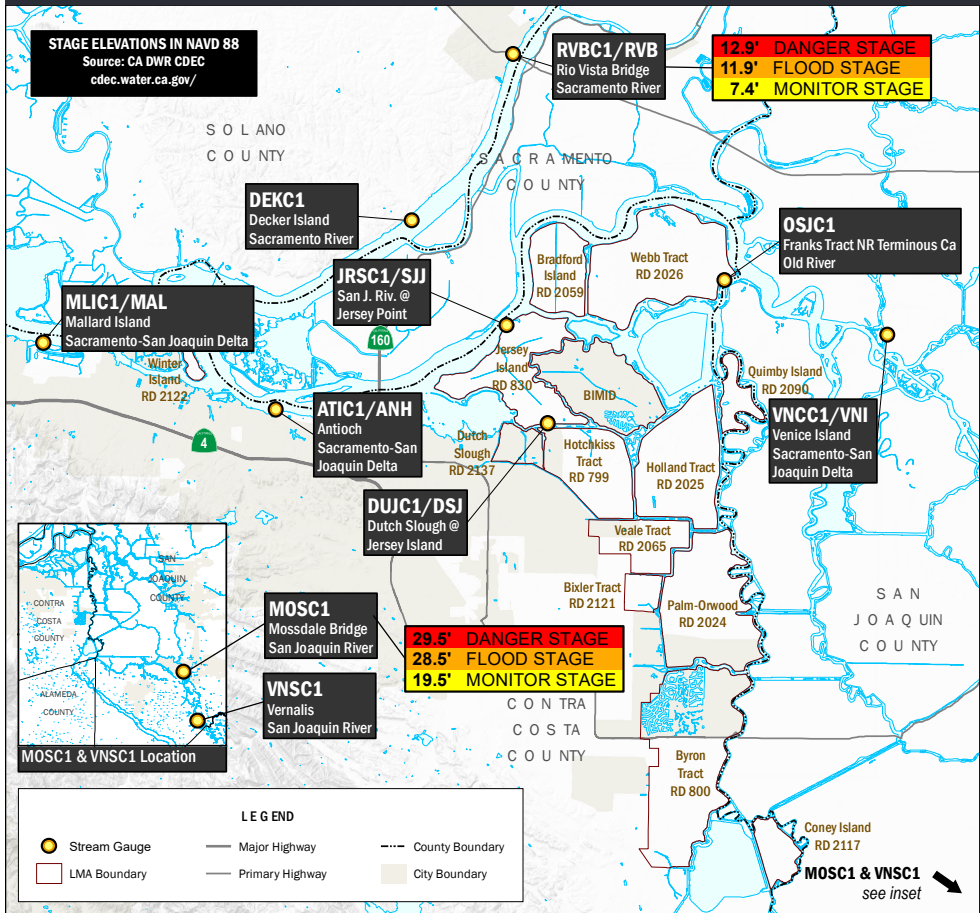
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|-------------------------------------|--|---|
| SACC1/IST I Street Bridge | RVBC1/RVB Rio Vista Bridge | DEKC1 Decker Island |
| MLIC1/MAL Mallard Island | JRSC1/SJJ SJ Riv. @ Jersey Pt | OSJC1 Franks Tract, Terminous |
| ATIC1/ANH Antioch | DUJC1/DSJ Dutch Slough @ Jersey Island | MOSC1/MSD Mossdale Bridge |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

No Known Staging Areas in Map Extent

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

No Known Supply Delivery Points in Map Extent

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

No Known Stockpile Resources in Map Extent

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

FLOOD FIGHT SUPPLIES

DWR recommended flood fight supplies at pump station 3.
37°59'44.82783960"N, 121°37'31.97254080"W

FLOOD FIGHT SUPPLIES

DWR recommended flood fight supplies at pump station 2.
38°00'40.94179560"N, 121°39'02.51730000"W

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

HAZMAT SITE

Air Monitoring Site
5551 Bethel Island Rd, Bethel Island
38°00'25.02498960"N, 121°38'32.44216560"W

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.313.2000

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.313.2000

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
800.952.5530

CALTRANS

Evacuation/Bridge Support

916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

DUTCH SLOUGH (RD 2137)

Nate Hershey
916.456.4400

PALM-ORWOOD TRACT (RD 2024)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

HOLLAND TRACT (RD 2025)

David A. Forkel
925.932.0251
Bus. 925.693.9977
Bus. Cell

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

JERSEY ISLAND (RD 830)

Chad Davidson 925.625.2279
ER Contact 925.727.2938

WEBB TRACT (RD 2026)

Al Warren Hoslett
209.943.5551, Bus.

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300

Hotchkiss Tract

RD 799

The symbology presented in the legend below is global to the project area. Some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

EVACUATION

Rally Point

EVACUATION ROUTES

Major Road Local Road

LEVEE INFORMATION

1000-Foot Levee Stationing
Levee Centerline

Tide Gate
Levee Access Point
Historic Levee Breach
Levee Erosion
Levee Seepage
Agricultural Return Drain/Siphon
Levee Crossing

RESPONSE INFORMATION

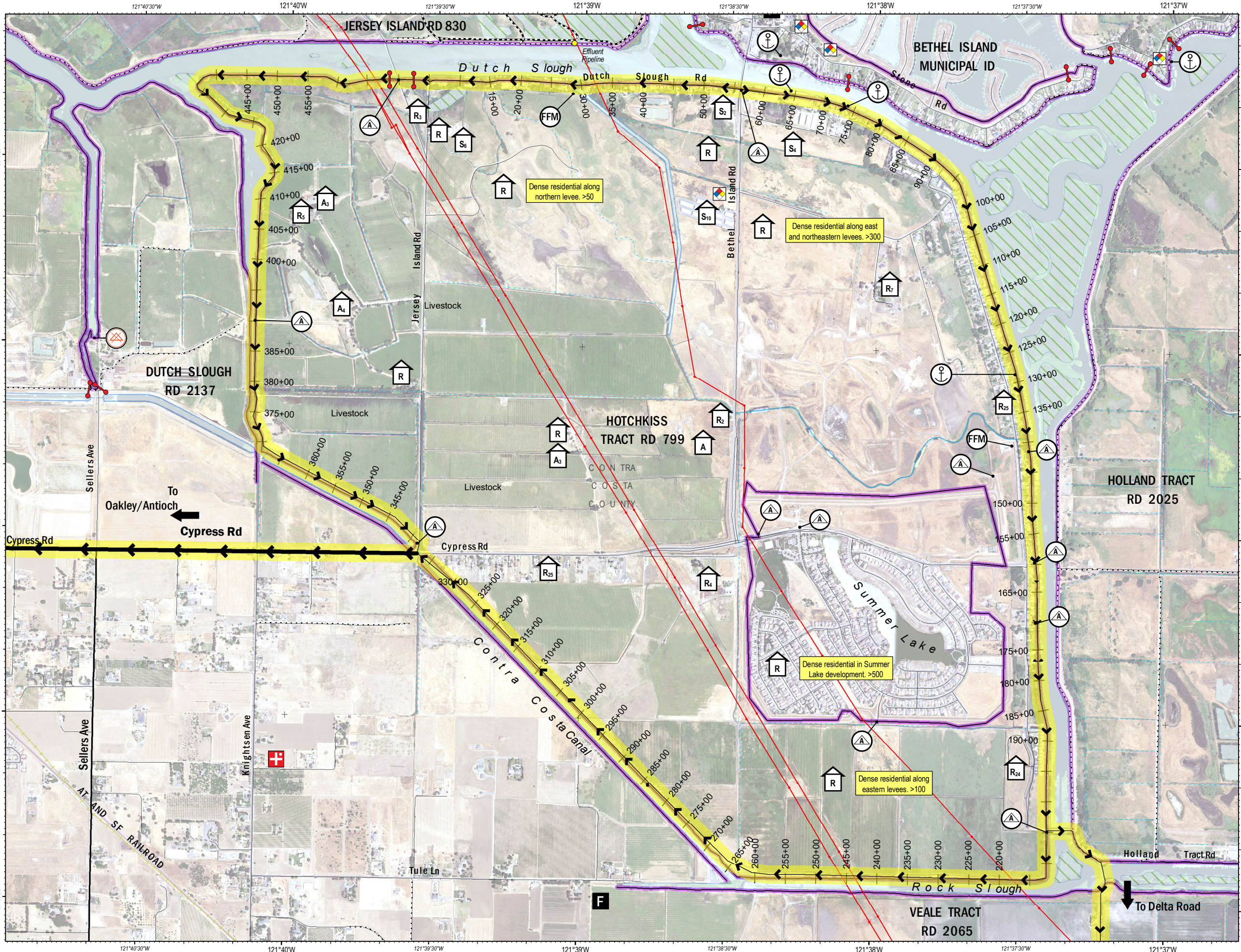
Structure
Boat Landing
Supply Delivery Point
Field Stockpile
Flood Fight Material
Supply Staging
T (type)
[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]

REFERENCE INFORMATION

Fire Station
Home Care
Ferry
Hazardous Material
School
Ag. Worker Camp
Dam
Underground Power Line
Transmission Line
Underground Gas Line
County Boundary

0 700 1,400 2,800 Feet

Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:18,200



FLOOD CONTINGENCY PLANNING INFORMATION

A.1. SPECIAL FLOOD CONSIDERATIONS

T1 - UTILITY INFRASTRUCTURE

Major utility crossings exist in this area. Utility crossings including three sets of high power electrical lines (PG&E and WAPA), and one 42-INCH high-pressure gas main. Coordinate with local county OES office in the event that utilities crews are needed.

T2 - BETHEL ISLAND BRIDGE

Bethel Island Bridge provides the only egress on and off the Bethel Island for motor vehicles. Flood season Communication and Coordination with the Bethel Island Improvement District should be conducted annually at minimum.

T3 - HIGH WATER EVENT

The Contra Costa Canal diverts water from Rock Slough area and conveys water for agricultural and municipal purposes. Contra Costa Canal is the backbone of the Contra Costa Water District (CCWD), delivering water from the Delta to the District’s treatment facilities and raw-water customers. Water is supplied to the canal from Old River via the Los Vaqueros Project pipelines and from Rock Slough. This canal serves a population of approx. 550,000 people in east Contra Costa County. In the event of high water or flooding, OES operators should coordinate with the Contra Costa Water District to monitor levee, flood and water conditions in Rock Slough. The Old River Pumping Plant, which is the intake for Los Vaqueros and an alternate intake for the Contra Costa Canal are protected by levees.

T4 - DISEASE CONTROL

There are and [unspecified] head of cattle on the island at all times. During a flood many head of cattle could become trapped and/or perish. Animal carcass management is a concern for disease control. Coordinate with the California Department of Food and Agriculture through the local county OES for disposal methods.

T5 - SUMMER LAKES

The development of Summer Lakes in Oakley is surrounded by a dry land levee. If the levees around Hotchkiss Tract would fail, Summer Lakes could be isolated by floodwaters. Populations in this area should be evacuated during elevated threat levels. Consult the county OES for evacuation procedures in this area.

T6 - HOTCHKISS GENERAL POPULATION

There is a population of over 1,000 people. Populations are general located within the Summer Lakes Master Planned Community. The Summer Lakes community is surrounded by a dry land levee.

T7 - FETCH CONDITIONS

There is no unusually high fetch conditions for exterior levees. Interior levee system could be subject to high velocities/and fetch in the event of an exterior levee failure.

T8 - LEVEE ACCREDITATION

The interior ring levee is a fully accredited FEMA 100-year levee. The external levee is not accredited. Hotchkiss Tract levees are not certified although elevation height exceeds standards at 11’3”. Hotchkiss Tract consists of one square mile of property with two miles of levees. The highest levee crown elevation is 14’.

T9 - NATURAL GAS AND OIL WELLS

According to the California Department of Conservation, Hotchkiss Tract has 9 active or idle natural gas and oil wells, and approximately 2,880 acres of gas and oil production fields.

T10 - ELECTRICAL TRANSMISSION LINES

Three major electric transmission lines (greater then 500kV) cross Hotchkiss Tract: the California Oregon Transmission Project, operated by the Western Area Power Administration, the Pacific Gas and Electric Company (PG&E) Table Mountain-Tesla line, and the PG&E Vaca-Dixon-Tesla line. The combined load on these three lines is typically around 4,000 Megawatt (MW), though under some circumstances it can be as high as 4,800 MW (Mirzadeh 2006). The loss of all three lines due to the failure of the Hotchkiss Tract levee system could cause load capacity problems in the region. PG&E also operates two other lines with less than 500kV capacity to provide local service to Hotchkiss Tract and nearby Delta Islands. Failure of the Hotchkiss Tract levee system would impact the ability of PG&E to serve the local delta community.

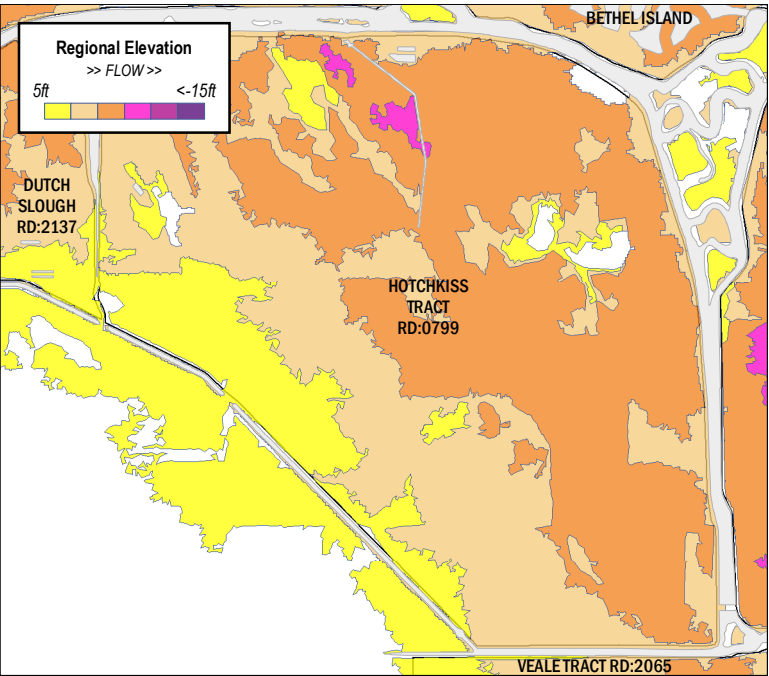
T11 - WORKER'S CAMP POPULATION

Typical worker’s camp population on Hotchkiss Tract totals approx. 9 People. Mostly seasonal Workers. Seasonal worker dwelling units are located at the highest elevations on the tract above most flood threat.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

T1 - LOCAL HIGH WATER EVENT

Multiple high water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. East side of Hotchkiss Tract Levee System may be lower than regional high water event. Vulnerable area approx. 5,000 FT. Muscle wall or temporary earthen levee is recommended.

ACTIONS

1. Close control gate at intake slough. 2. Activate workforce for levee patrols. 3. Move or evacuate cattle population. 4. Prepare resources for temporary earthen levee or muscle wall. Muscle Wall Material Required: 5000 feet of temporary levee will require approximately 834 segments of muscle wall, 8340 sandbags, and 4170 cubic feet of sand. OR Temporary Earthen Levee Material Required: 5000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 100 rolls of 10 mil plastic sheeting, 1500 sandbags, and 225 cubic yards of fill. Approximately 27.8 cubic yards of fill for sand bags and 197.2 cubic yards of fill for visqueen fill.

NOTE: This is a hypothetical flood contingency option based on DWR’s flood fight methods to calculate material needs based on a given length of levee vulnerability.

C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

FLOOD FIGHT LABOR

| | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |
|--|-------------------------------------|-------------------------------------|

REPAIR CONTRACTORS

| | | | |
|--|--|---|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |
|--|--|---|---|

MATERIALS SUPPLIERS

| | | |
|--|---|---|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
|--|---|---|

| | | |
|--|--|---|
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |
|--|--|---|

| | | |
|--|---|--|
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |
|--|---|--|

| | |
|--|--|
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 |
|--|--|

LOCAL SUPPLY PROVIDERS

| | | |
|---|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
|---|---|--|

| | | |
|--|---|--|
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |
|--|---|--|

| | |
|--|--|
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 |
|--|--|

Hotchkiss Tract

RD 799

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

| | | | | | |
|------------|---------|------------|------------|--------------|-------|
| Interstate | Highway | Major Road | Local Road | Trail, Major | Trail |
|------------|---------|------------|------------|--------------|-------|

FLOOD CONTINGENCY OPTIONS

D3 Flood Contingency Option

D2 Special Flood Consideration

LEVEE INFORMATION

1000-Foot Levee Stationing

Levee Centerline

| | |
|--------------------|----------------------------------|
| Tide Gate | Agricultural Return Drain/Siphon |
| Levee Access Point | Levee Crossing |

RESPONSE INFORMATION

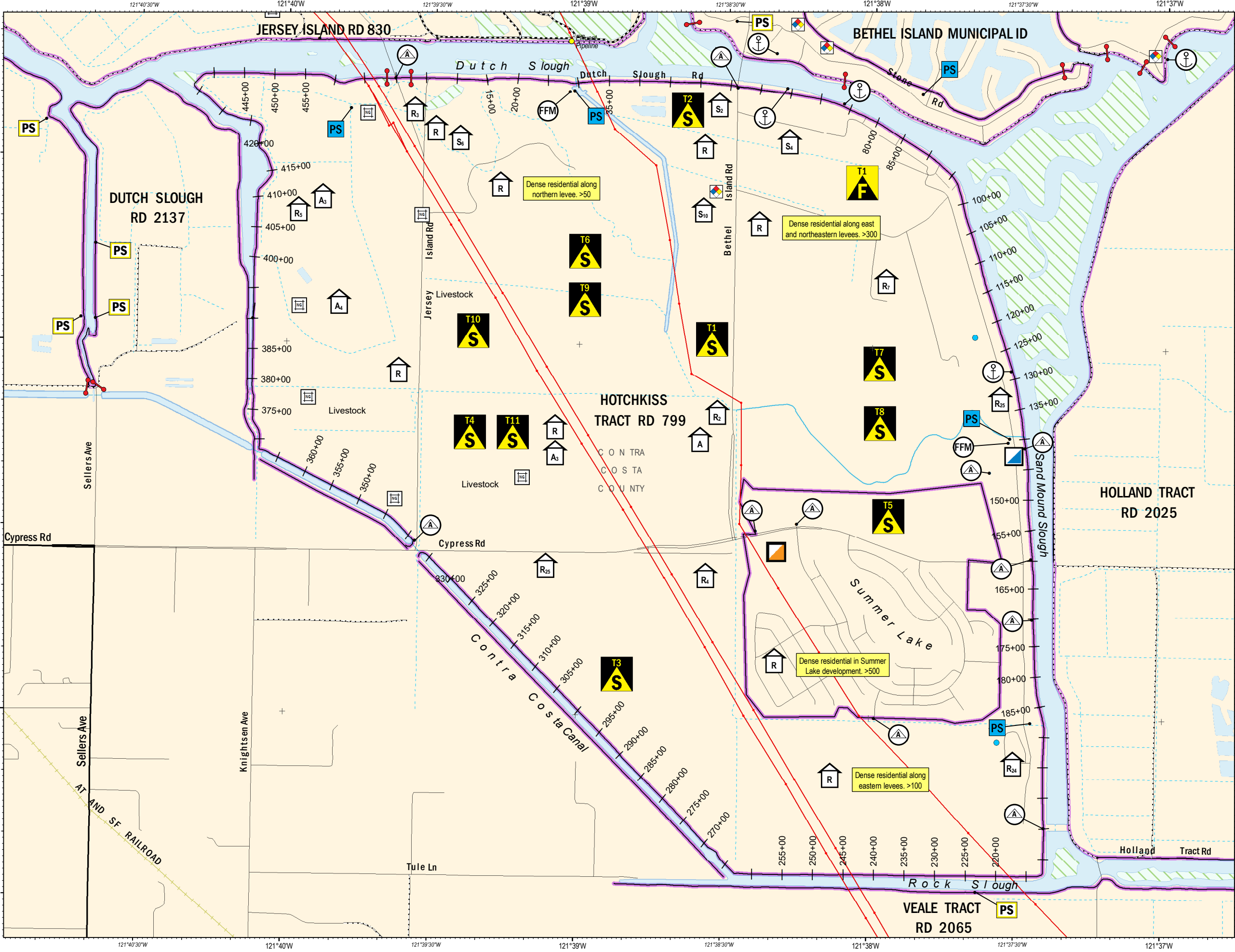
| | |
|-----------------------|---|
| Structure | T (type) [A - Agricultural; R - Residential; S - Seasonal; U - Unknown] # (count) - [Approx. Structure Count] |
| Boat Landing | Command Post |
| Supply Delivery Point | Command Post Secondary |
| Field Stockpile | Pump Station |
| Flood Fight Material | Pump Station Agricultural |
| Helispot | |
| Supply Staging | |

REFERENCE INFORMATION

| | |
|------------------------|------------------------|
| Ferry | Communication Facility |
| Potable Water Facility | Waster Water Facility |
| Solid Waste Facility | Natural Gas Facility |
| Hazardous Material | |
| UG | Underground Power Line |
| | Transmission Line |
| UG | Underground Gas Line |
| | County Boundary |

0 700 1,400 2,800 Feet

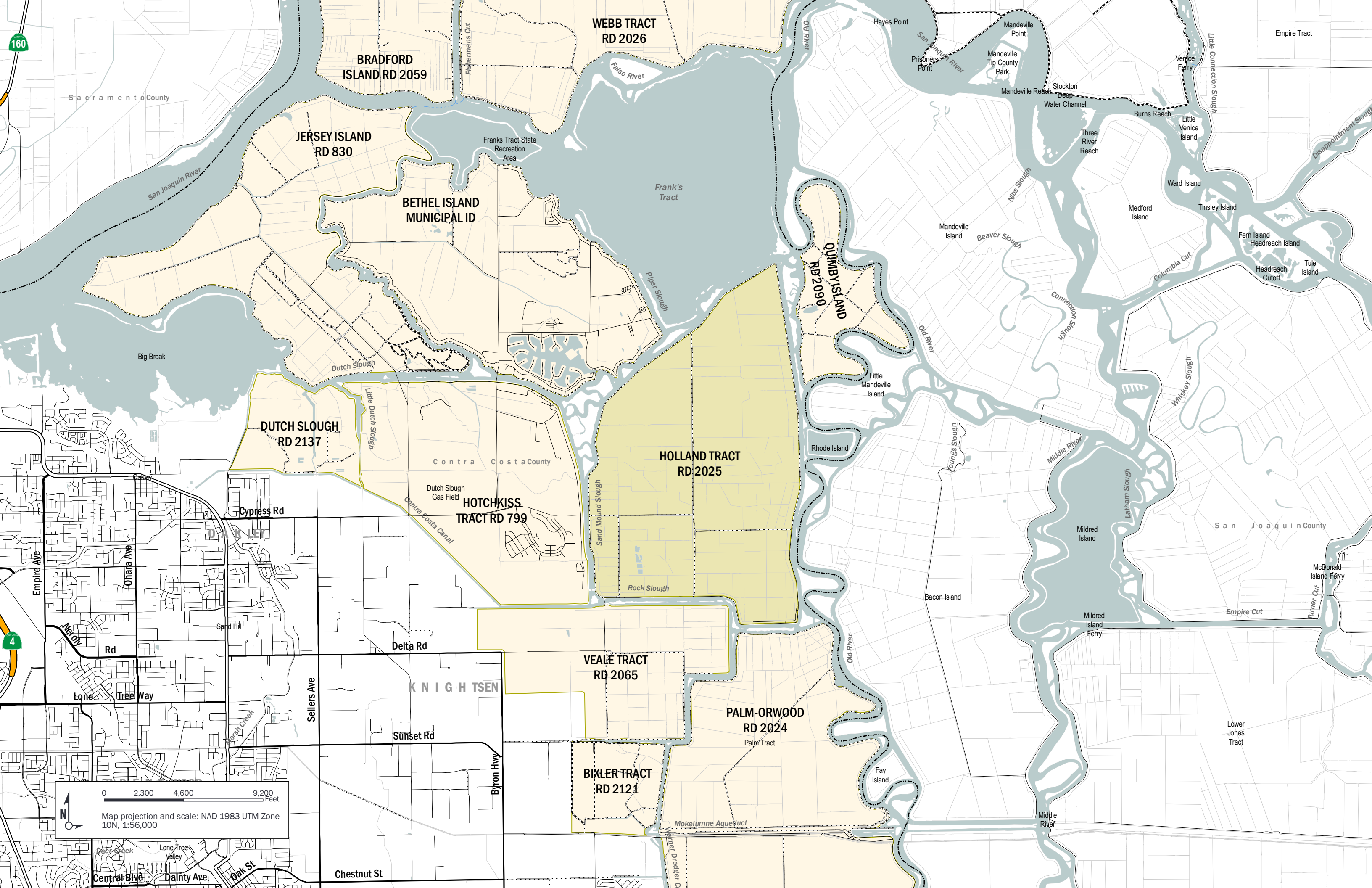
Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:18,200



Holland Tract RD 2025



HOLLAND TRACT



WEBB TRACT
RD 2026

BRADFORD
ISLAND RD 2059

JERSEY ISLAND
RD 830

BETHEL ISLAND
MUNICIPAL ID

DUTCH SLOUGH
RD 2137

HOTCHKISS
TRACT RD 799

HOLLAND TRACT
RD 2025

VEALE TRACT
RD 2065

BIXLER TRACT
RD 2121

PALM-ORWOOD
RD 2024

S a c r a m e n t o County

C o n t r a C o s t a County

S a n J o a q u i n County

Map projection and scale: NAD 1983 UTM Zone 10N, 1:56,000

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

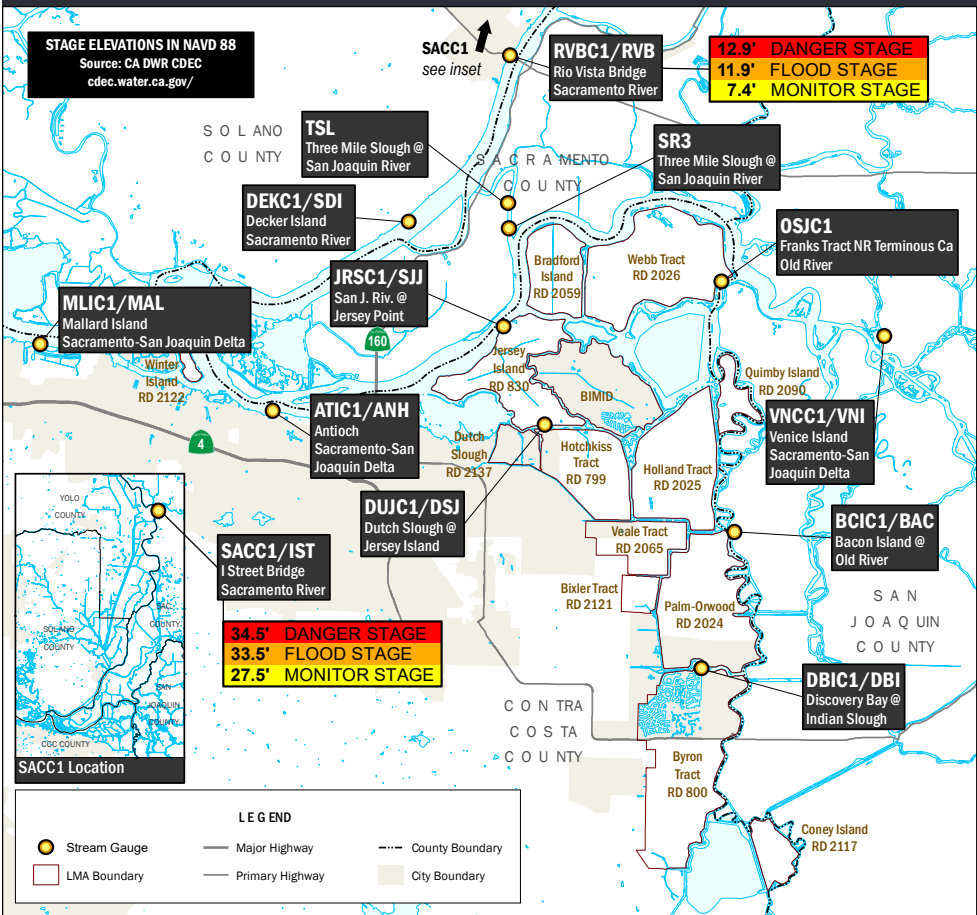
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|-------------------------------------|--|---|
| SACC1/IST I Street Bridge | RVBC1/RVB Rio Vista Bridge | DEKC1 Decker Island |
| MLIC1/MAL Mallard Island | JRSC1/SJJ SJ Riv. @ Jersey Pt | OSJC1 Franks Tract, Terminous |
| ATIC1/ANH Antioch | DUJC1/DSJ Dutch Slough @ Jersey Island | VNCC1/VNI Venice Island |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

FLOOD FIGHT STAGING

The staging area will be located at the south end of Center Road near station 472+00 37°58'38.69887440"N, 121°36'08.57300040"W

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

No Known Supply Delivery Points in Map Extent

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

RIP RAP STOCKPILE

Rock stockpile stored on island for immediate use in flood fight. 37°59'13.85517480"N, 121°34'58.53153000"W

RIP RAP STOCKPILE

Rock stockpile stored on island for immediate use in flood fight. 37°59'22.88007600"N, 121°37'17.56632360"W

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

FLOOD FIGHT MATERIALS

Inventory meets DWR requirements: Visqueen, sandbags, twine, stakes, tie buttons, pliers, sledge hammers, shovels, life vests, survey lathe, flagging tape, markers, pencils and pads, spotlight, tool box and lock. 38°01'11.73844200"N, 121°35'01.07962440"W

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

No Known HazMat Locations in Map Extent

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY OFFICE OF EMERGENCY SERVICES

CCC OES
925-228-5000, 24-HOUR

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.427.8562

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
916.574.2619

CALTRANS

Evacuation/Bridge Support
916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell

JERSEY ISLAND (RD 830)

Chad Davidson
925.625.2279
ER Contact
925.727.2938

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

DUTCH SLOUGH (RD 2137)

Nate Hershey
916.456.4400

PALM-ORWOOD TRACT (RD 2024)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

HOLLAND TRACT (RD 2025)

David A. Forkel
925.932.0251
925.693.9977

WEBB TRACT (RD 2026)

Al Warren Hoslett
209.943.5551, Bus.

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300

Holland Tract

RD 2025

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

LEVEE INFORMATION

1000-Foot Levee Stationing
Levee Centerline

Tide Gate
Levee Access Point
Historic Levee Breach
Levee Erosion
Levee Seepage

Agricultural Return Drain/Siphon
Levee Crossing

RESPONSE INFORMATION

Structure
T (type)
[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]

Boat Landing
Supply Delivery Point
Field Stockpile
Flood Fight Material
Supply Staging

REFERENCE INFORMATION

Fire Station
Home Care
Ferry
Hazardous Material
School
Ag. Worker Camp
Dam

Underground Power Line
Transmission Line
Underground Gas Line
County Boundary

0 1,100 2,200 4,400 Feet

Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:28,600

FLOOD CONTINGENCY PLANNING INFORMATION

A.1. SPECIAL FLOOD CONSIDERATIONS

H1 - PUMP STATION 1
Located near station 19+00. Discharge pump may be used during a major flood event; however, additional pumps would be required to dewater the island.

H2 - PUMP STATION 2
Located near station 73+00. Discharge pump may be used during a major flood event; however, additional pumps would be required to dewater the island.

H3 - PUMP STATION 3
Located near station 239+00. Discharge pump may be used during a major flood event; however, additional pumps would be required to dewater the island.

H4 - HOLLAND TRACT BRIDGE
Holland Tract Bridge is the only motor vehicle egress for Holland Tract. A secondary bridge is located in the general vicinity of Sandmound Blvd. Contact the local Reclamation District to gain access to Sandmound Blvd in the event of an emergency.

H5 - FRANKS TRACK OPEN WATER
The flooding threat is predominantly tidal, with some local runoff that can influence conditions. The Old River (on the east side of the island) could pose a riverine flooding threat. Franks Tract (large expanse of open water) can create erosion due to wind/waves.

H6 - WAVE FETCH
The wave fetch is relatively short on the southern, eastern, and western portions of the island and is generally not a concern over much of the District. The northern portion of the island has a wave fetch of up to 3.5 miles across Franks Tract. Channel widths generally vary from 150 to 1,450 feet. The levees are armored with riprap, except some areas along the southern and eastern levees.

H7 - LEVEE STATUS
There is no levee certification status for Holland Tract. The levee geometry generally meets the PL 84-99 Delta Specific Standard.

H8 - TRACT INHABITANTS
Two active marinas are located along the south levee (Lindquist Landing and Holland Riverside Marina), with up to 40 inhabitants living boats at any given time.

H9 - LEVEE ACCESS
County-maintained road is located on the crown of the south levee and portions of the east levee.

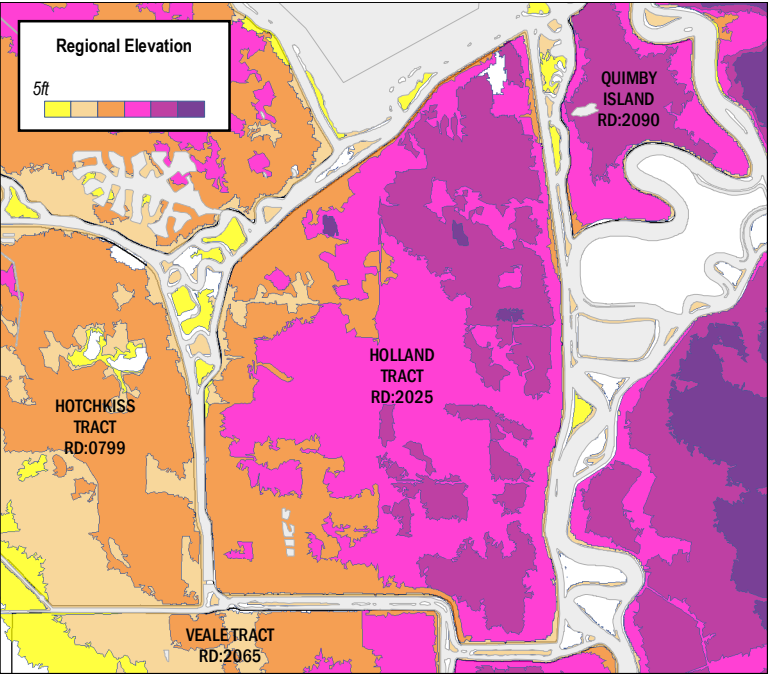
H10 - LAND USES
Portions of the island are farmed or leased for grazing, with operations supported by various facilities and equipment. The island also has permanent habitat sites.

H11 - PUMP STATION INFRASTRUCTURE
Infrastructure includes pumping stations for drainage and associated electrical lines.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

H1 - HIGH WATER EVENT
Multiple high water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Vulnerable area approx.. 2,000 feet. Muscle wall or temporary earthen levee is recommended.
ACTIONS
The District maintains stockpiles of riprap on the island and has equipment available to perform levee maintenance and repairs.
1. Deploy flood fight materials to prevent levee degradation and activate workforce for levee patrols.
2. Prepare resources for temporary earthen levee or muscle wall.
Muscle Wall Material Required:
2000 feet of temporary levee will require approximately 334 segments of muscle wall, 3340 sandbags, and 1670 cubic feet of sand.
OR
Temporary Earthen Levee Material Required:
2000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 40 rolls of 10 mil plastic sheeting, 600 sandbags, and 90 cubic yards of fill. Approximately 11.1 cubic yards of fill for sand bags and 78.9 cubic yards of fill for visqueen fill.

H2 - WAVE WASH
Wind waves could occur at this location. Wind waves causing erosion will lead to levee failure if not addressed for long periods of time; protection area approx. 1000 feet.
ACTIONS
The District has flood fight materials stored on-island for use during a flood fight.
1. Deploy flood fight materials to prevent levee degradation.
2. Protect area exposed to wind waves with envelope style wrap.
Wave Wash Protection Material Required:
1000 feet of envelope wave wash will require approximately 20 rolls of 10 mil plastic sheeting, 300 sandbags, 150 cubic feet of sand, 20 rolls of twine, 100 plastic buttons or rocks, and 200 [1" x 3" x 2'] stakes.

H3 - BOIL FROM SEEPAGE THROUGH LEVEE
Boil events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Not associated with wind generated waves and erosion. Response to boils require sack ring, or boil ring, to control water flow and pressure through levee to minimize transport of fine material through seepage that has uncontrolled flow of water and transport of levee material. Tides and low pressure can play a part in both wind and seepage impact potential.
ACTIONS
1. Protect and isolate seepage area with boil sack ring.

C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

| FLOOD FIGHT LABOR | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |

| REPAIR CONTRACTORS | | | |
|--|--|---|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |

| MATERIALS SUPPLIERS | | |
|--|---|---|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |

| | | |
|--|--|--|
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 | |

| LOCAL SUPPLY PROVIDERS | | |
|--|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 | |

Holland Tract

RD 2025

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

FLOOD CONTINGENCY OPTIONS

D3 Flood Contingency Option D2 Special Flood Consideration

LEVEE INFORMATION

1000-Foot Levee Stationing
Levee Centerline
Tide Gate Agricultural Return Drain/Siphon
Levee Access Point Levee Crossing

RESPONSE INFORMATION

Structure T (type) [A - Agricultural, R - Residential, S - Seasonal, U - Unknown]
(count) - [Approx. Structure Count]
Boat Landing Command Post
Supply Delivery Point Command Post Secondary
Field Stockpile PS Pump Station
Flood Fight Material PS Pump Station Agricultural
Helispot
Supply Staging

REFERENCE INFORMATION

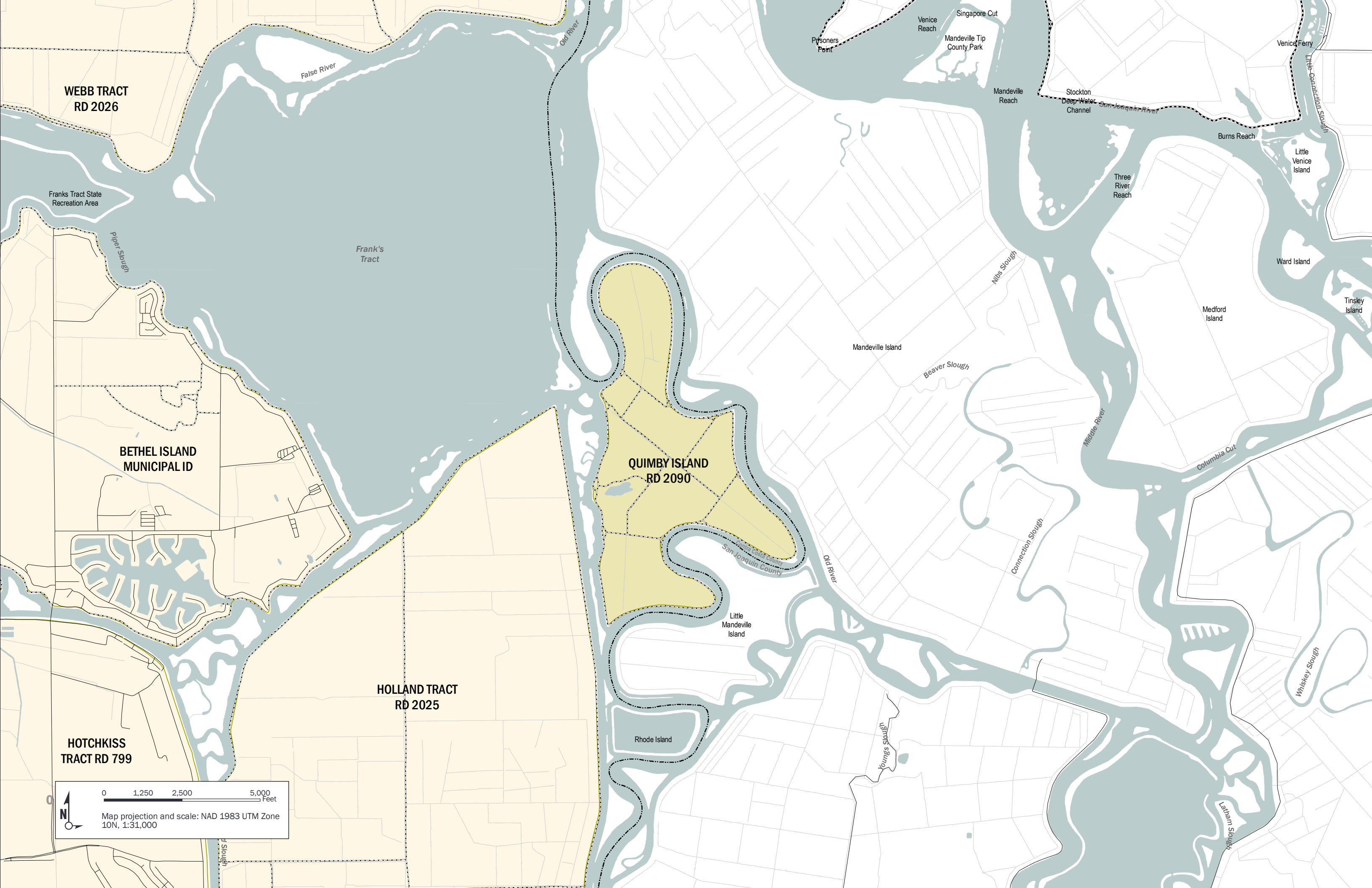
Ferry Communication Facility
Potable Water Facility Waster Water Facility
Solid Waste Facility Natural Gas Facility
Hazardous Material
UG UG Underground Power Line
Transmission Line
UG UG Underground Gas Line
County Boundary

0 1,100 2,200 4,400 Feet

Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:28,600

Quimby Island..... RD 2090





WEBB TRACT
RD 2026

Franks Tract State
Recreation Area

Frank's
Tract

BETHEL ISLAND
MUNICIPAL ID

HOTCHKISS
TRACT RD 799

HOLLAND TRACT
RD 2025

QUIMBY ISLAND
RD 2090

Rhode Island

Little
Mandeville
Island

Mandeville Island

Beaver Slough

Connection Slough

Middle River

Columbia Cut

Medford
Island

Three
River
Reach

Burns Reach

Ward Island

Little
Venice
Island

Venice Ferry

Venice
Reach

Mandeville Tip
County Park

Singapore Cut

Mandeville
Reach

Stockton
Deep Water
Channel

San Joaquin River

Tinsley
Island

Whiskey Slough

Latham Slough

Youngs Slough

Old River

San Joaquin County
Alameda County

Old River

False River

Pipey Slough



0 1,250 2,500 5,000 Feet

Map projection and scale: NAD 1983 UTM Zone
10N, 1:31,000

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

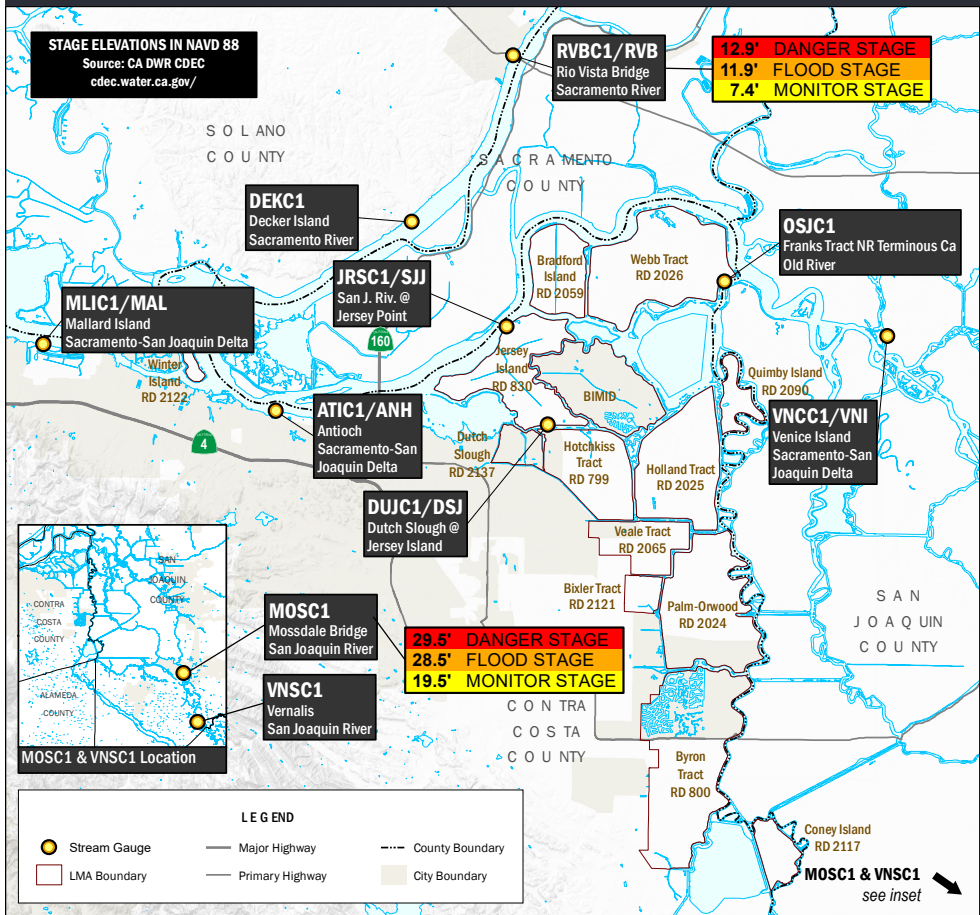
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|-------------------------------------|--|---|
| SACC1/IST I Street Bridge | RVBC1/RVB Rio Vista Bridge | DEKC1 Decker Island |
| MLIC1/MAL Mallard Island | JRSC1/SJJ SJ Riv. @ Jersey Pt | OSJC1 Franks Tract, Terminous |
| ATIC1/ANH Antioch | DUJC1/DSJ Dutch Slough @ Jersey Island | MOSC1/MSD Mossdale Bridge |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

No Known Staging Areas in Map Extent

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

FERRY LANDING

Supplies can be delivered via watercraft at ferry landing on northwest side of island.
38°01'48.75926160"N, 121°34'46.40106360"W

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

STOCKPILE

Gravel on levee.
38°00'46.04132520"N, 121°34'03.67330080"W

STOCKPILE

Gravel on levee.
38°00'54.38625480"N, 121°34'20.44008480"W

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

STORAGE

Flood fight materials storage area on northwest side of island near ferry landing.
38°01'46.92400680"N, 121°34'43.04278200"W

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

No Known HazMat Locations in Map Extent

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY OFFICE OF EMERGENCY SERVICES

CCC OES
925-228-5000, 24-HOUR

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.427.8562

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
916.574.2619

CALTRANS

Evacuation/Bridge Support

916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell

JERSEY ISLAND (RD 830)

Chad Davidson
925.625.2279
ER Contact
925.727.2938

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

HOLLAND TRACT (RD 2025)

David A. Forkel
925.932.0251
925.693.9977

PALM-ORWOOD TRACT (RD 2024)

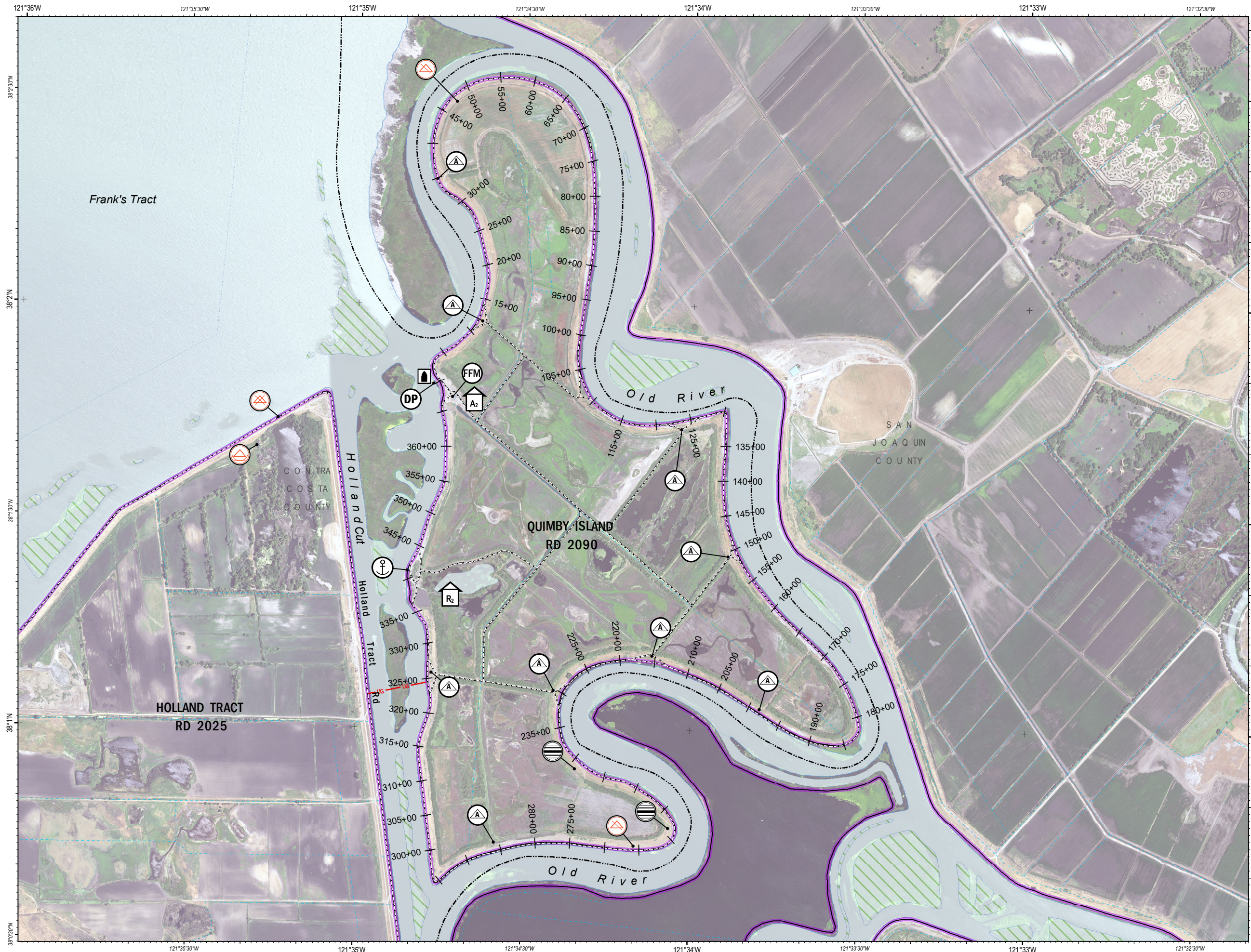
Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

WEBB TRACT (RD 2026)

Al Warren Hoslett
209.943.5551, Bus.

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300



Quimby Island

RD 2090

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

- Interstate
- Highway
- Major Road
- Local Road
- Trail, Major
- Trail

LEVEE INFORMATION

- 1000-Foot Levee Stationing
- Levee Centerline
- Tide Gate
 - Levee Access Point
 - Historic Levee Breach
 - Levee Erosion
 - Levee Seepage
 - Agricultural Return Drain/Siphon
 - Levee Crossing

RESPONSE INFORMATION

- Structure
- T (type)
[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]
- Boat Landing
 - Supply Delivery Point
 - Field Stockpile
 - Flood Fight Material
 - Supply Staging

REFERENCE INFORMATION

- Fire Station
- Home Care
- Ferry
- Hazardous Material
- School
- Ag. Worker Camp
- Dam
- Underground Power Line
- Transmission Line
- Underground Gas Line
- County Boundary



Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:15,900

A.1. SPECIAL FLOOD CONSIDERATIONS

Q1 - ACCESS TO QUIMBY ISLAND
Access to Quimby Island is by ferry only. The ferry is located on the west side of the Island at the confluence of Sheep Slough, Old River and Holland Cut. Emergency access would be provided barge for flood fight supplies, equipment and other emergency needs.

Q2 - DISTRICT PUMP VULNERABILITIES
Byron Tract pumping stations are below 100-year flood elevation. If a levee breach is imminent, efforts to protect the pump stations should be evaluated.

Q3 - FETCH CONDITIONS
Significant characteristics of this waterway is high fetch conditions from Franks Tract across Holland Cut as well as areas along Old River.

Q4 - SEDIMENT ON OLD RIVER
Reverse flows are also creating sediment accretion on outside bends in Old River that reduce channel capacity and marine navigational capability.

Q5 - LEVEE GEOMETRY
RD 2090 meets its certification status based on Hazard Mitigation Plan (HMP) criteria for levee geometry.

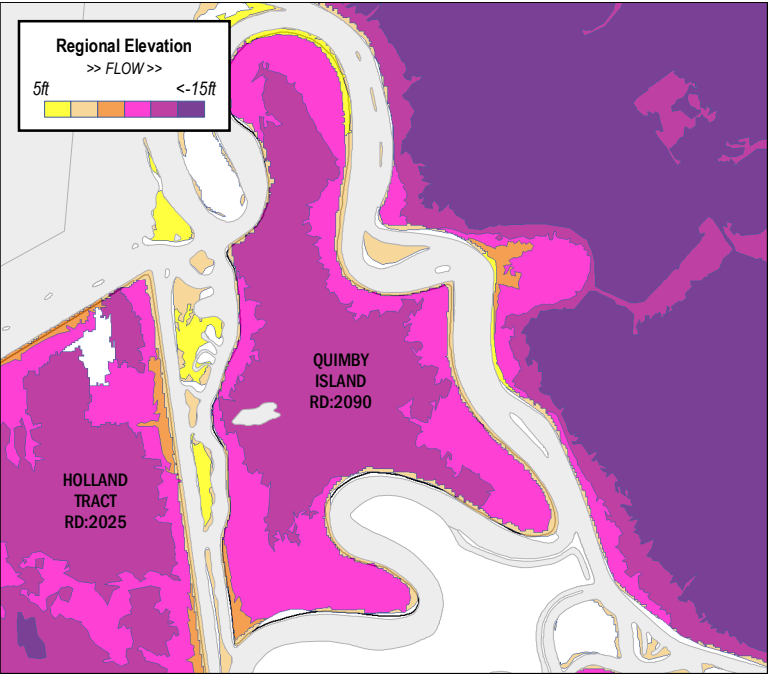
Q6 - STRUCTURES AND POPULATION
RD 2090 protects a single residence and labor housing.

Q7 - LEVEE SCOUR
SWP reverse flow in Old River have been known to scour RD 2090 levees.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

Q1 - HIGH WATER EVENT
Multiple high water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Vulnerable area approx. 2,000 FT. Muscle wall or temporary earthen levee is recommended.

- ACTIONS**
1. Activate workforce for levee patrols - regular scheduled levee patrols depending on the severity of the event.
 2. Deploy flood fight materials to prevent levee degradation. Prepare resources for temporary earthen levee or muscle wall (utilize borrow material on site, if necessary). Muscle Wall Material Required: 2000 feet of temporary levee will require approximately 334 segments of muscle wall, 3340 sandbags, and 1670 cubic feet of sand. OR Temporary Earthen Levee Material Required: 2000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 40 rolls of 10 mil plastic sheeting, 600 sandbags, and 90 cubic yards of fill. Approximately 11.1 cubic yards of fill for sand bags and 78.9 cubic yards of fill for Visqueen fill.

NOTE: This is a hypothetical flood contingency option based on DWR’s flood fight methods to calculate material needs based on a given length of levee vulnerability.

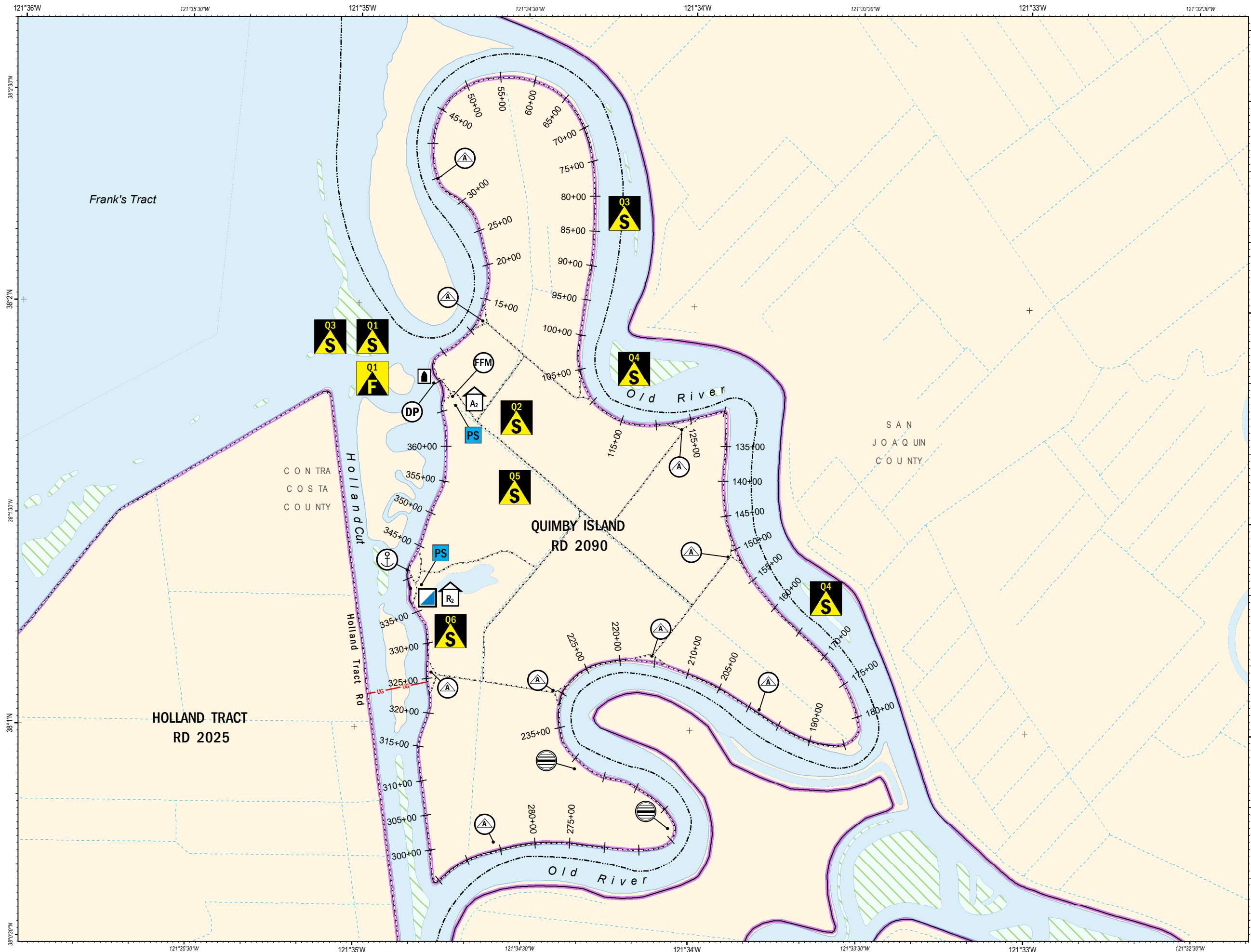
C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

| FLOOD FIGHT LABOR | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |

| REPAIR CONTRACTORS | | | |
|--|--|---|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |

| MATERIALS SUPPLIERS | | |
|--|---|--|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 | |

| LOCAL SUPPLY PROVIDERS | | |
|--|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 | |



Quimby Island

RD 2090

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate | Highway | Major Road | Local Road | Trail, Major | Trail

FLOOD CONTINGENCY OPTIONS

D3

F

Flood Contingency Option

D2

S

Special Flood Consideration

LEVEE INFORMATION

1000-Foot Levee Stationing

Levee Centerline

Tide Gate

Levee Access Point

Agricultural Return Drain/Siphon

Levee Crossing

RESPONSE INFORMATION

T_#

Structure

T (type)
[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]

Boat Landing

Supply Delivery Point

Field Stockpile

Flood Fight Material

Helispot

Supply Staging

Command Post

Command Post Secondary

PS

Pump Station

Pump Station Agricultural

REFERENCE INFORMATION

Ferry

Potable Water Facility

Solid Waste Facility

Hazardous Material

Communication Facility

Waster Water Facility

Natural Gas Facility

UG

UG

Underground Power Line

Transmission Line

UG

UG

Underground Gas Line

County Boundary

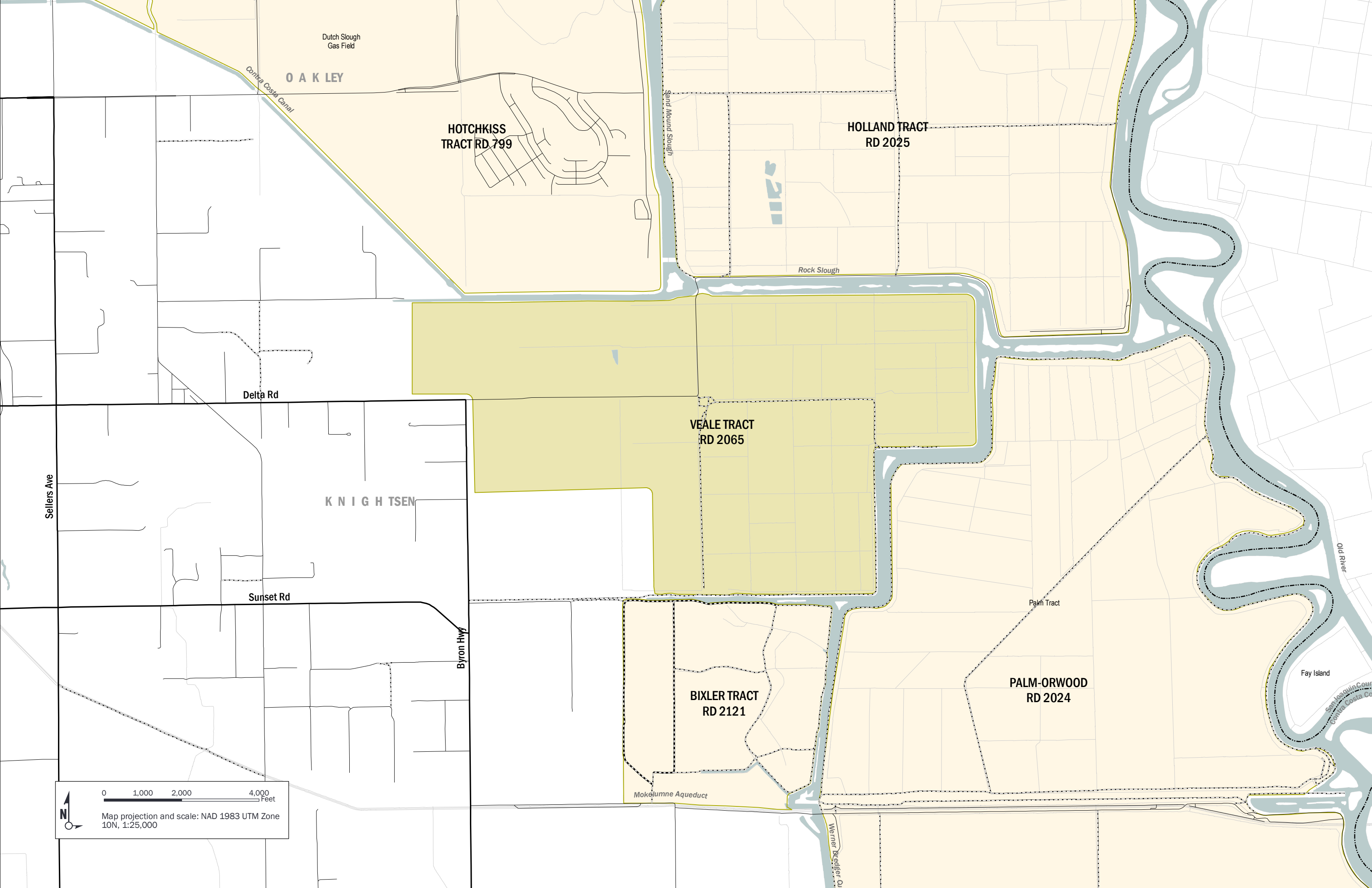
N

0 600 1,200 2,400 Feet

Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:15,900

Veale Tract RD 2065





Dutch Slough
Gas Field

O A K LEY

HOTCHKISS
TRACT RD 799

HOLLAND TRACT
RD 2025

Rock Slough

Delta Rd

VEALE TRACT
RD 2065

K N I G H T S E N

Sunset Rd

Byron Hwy

BIXLER TRACT
RD 2121

PALM-ORWOOD
RD 2024

Palm Tract

Fay Island

Mokelumne Aqueduct

Werner Bredder Ct

Old River

San Joaquin County
Contra Costa County

N

0

1,000

2,000

4,000

Feet

Map projection and scale: NAD 1983 UTM Zone 10N, 1:25,000

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

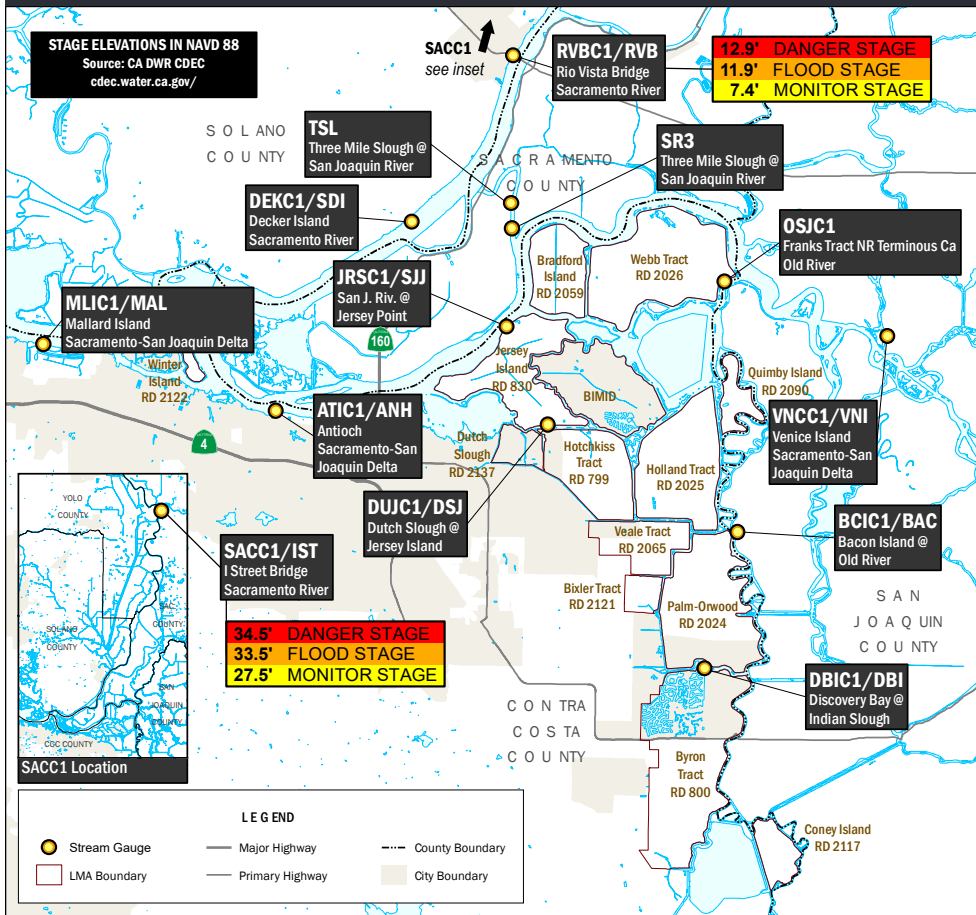
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|-------------------------------------|--|---|
| SACC1/IST I Street Bridge | RVBC1/RVB Rio Vista Bridge | DEKC1 Decker Island |
| MLIC1/MAL Mallard Island | JRSC1/SJJ SJ Riv. @ Jersey Pt | OSJC1 Franks Tract, Terminous |
| ATIC1/ANH Antioch | DUJC1/DSJ Dutch Slough @ Jersey Island | VNCC1/VNI Venice Island |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

FLOOD FIGHT STAGING

The staging area would be located near the District Headquarters off of Delta Road.
37°58'06.99076920"N, 121°37'09.94954800"W

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

No Known Supply Delivery Points in Map Extent

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

EMERGENCY FILL

In an event where additional on-island fill material is needed, fill stockpile located here in the interior of the district, east of District Headquarters.
37°58'04.64657160"N, 121°36'59.18126040"W

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

No Known Flood Fight Materials in Map Extent

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

CRAIG ANDREWS PROPERTY

Enforcement/Compliance Activity
3156 Delta Road
37°58'05.80360440"N, 121°38'14.78609880"W

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY OFFICE OF EMERGENCY SERVICES

CCC OES
925-228-5000, 24-HOUR

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.427.8562

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
916.574.2619

CALTRANS

Evacuation/Bridge Support

916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell

JERSEY ISLAND (RD 830)

Chad Davidson
925.625.2279
ER Contact
925.727.2938

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

DUTCH SLOUGH (RD 2137)

Nate Hershey

916.456.4400

HOLLAND TRACT (RD 2025)

David A. Forkel
925.932.0251
925.693.9977

PALM-ORWOOD TRACT (RD 2024)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

WEBB TRACT (RD 2026)

Al Warren Hoslett
209.943.5551, Bus.

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300

Veale Tract

RD 2065

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

LEVEE INFORMATION

1000-Foot Levee Stationing
Levee Centerline

Tide Gate
Levee Access Point
Historic Levee Breach
Levee Erosion
Levee Seepage

Agricultural Return Drain/Siphon
Levee Crossing

RESPONSE INFORMATION

Structure
T (type)
[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]

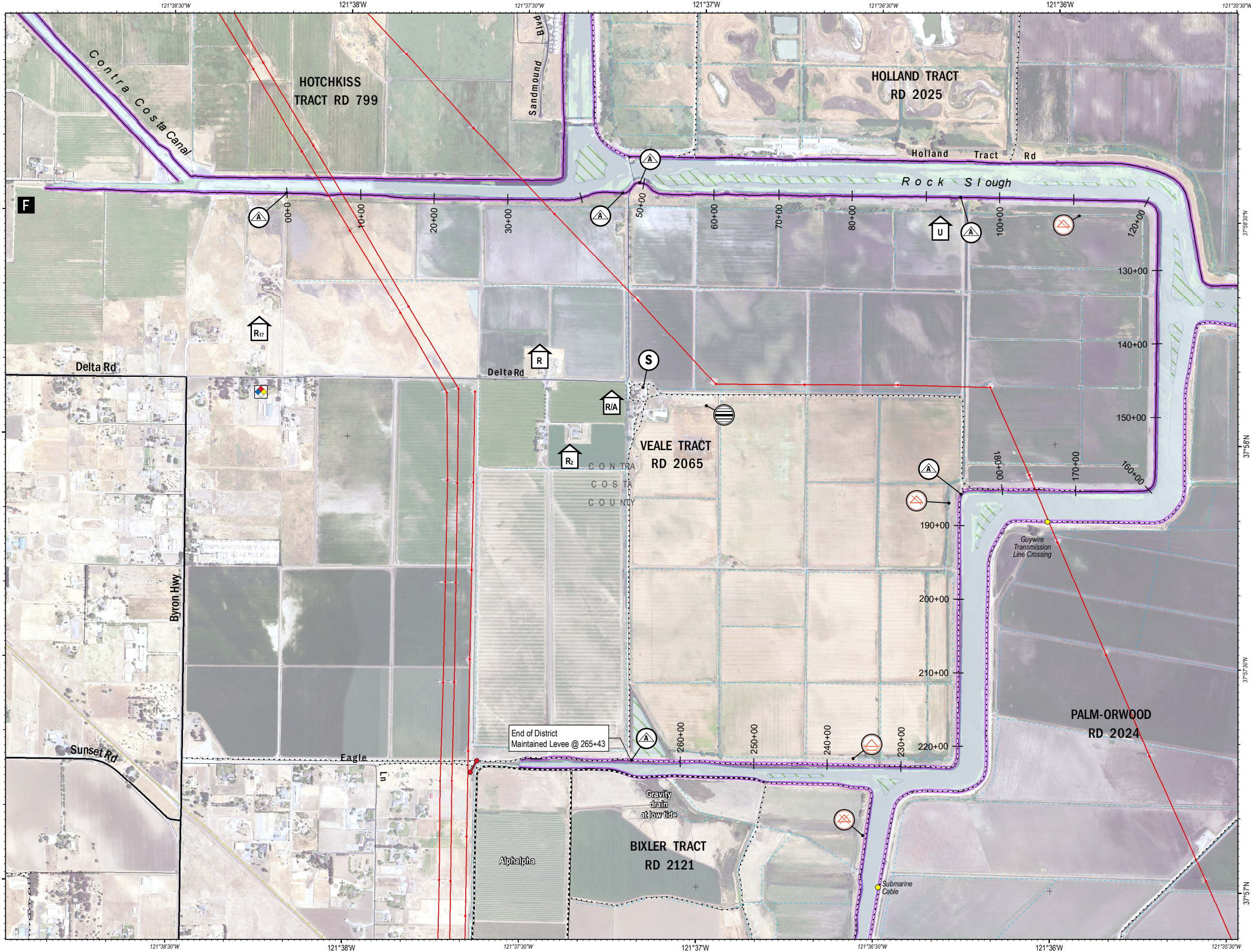
Boat Landing
Supply Delivery Point
Field Stockpile
Flood Fight Material
Supply Staging

REFERENCE INFORMATION

Fire Station
Home Care
Ferry
Hazardous Material
School
Ag. Worker Camp
Dam

UG - Underground Power Line
Transmission Line
UG - Underground Gas Line
County Boundary

0 550 1,100 2,200 Feet
Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:15,100



FLOOD CONTINGENCY PLANNING INFORMATION

A.1. SPECIAL FLOOD CONSIDERATIONS

V1 - PUMP STATION 1
Secondary pumps located near station 94+00. These discharge pumps may be utilized during a major flood event, however additional pumps would be needed to dewater the island.

V2 - PUMP STATION 2
Primary pumps located near station 183+00. These discharge pumps may be utilized during a major flood event. These pumps are used daily as the primary pump station for the district.

V3 - EVACUATION CONSIDERATIONS
Primary exit route via district headquarters, proceed along Delta Road towards Knightsen Avenue. Secondary exit along Delta Road towards Knightsen Avenue.

V4 - GENERAL FLOOD THREAT
The flooding threat is predominantly tidal, with some local runoff that can influence conditions.

V5 - LEVEE CONDITIONS
The District is above the Hazard Mitigation (HMP) design standard for the entire levee system. The levee was recently improved during a 2016 construction project. All levees meet and exceed HMP, closer to PL 84-99.

V6 - ROCK SLOUGH BERM
Significant characteristics are remnant berm along Rock Slough east of the Delta Road Bridge. Remnant berm has a width of approx. 400 feet.

V7 - WARNER'S CUT BERM
Significant characteristics are remnant berm along Warner's Cut on east boundary. Remnant berm has a width of approx. varies between 350-500 feet width.

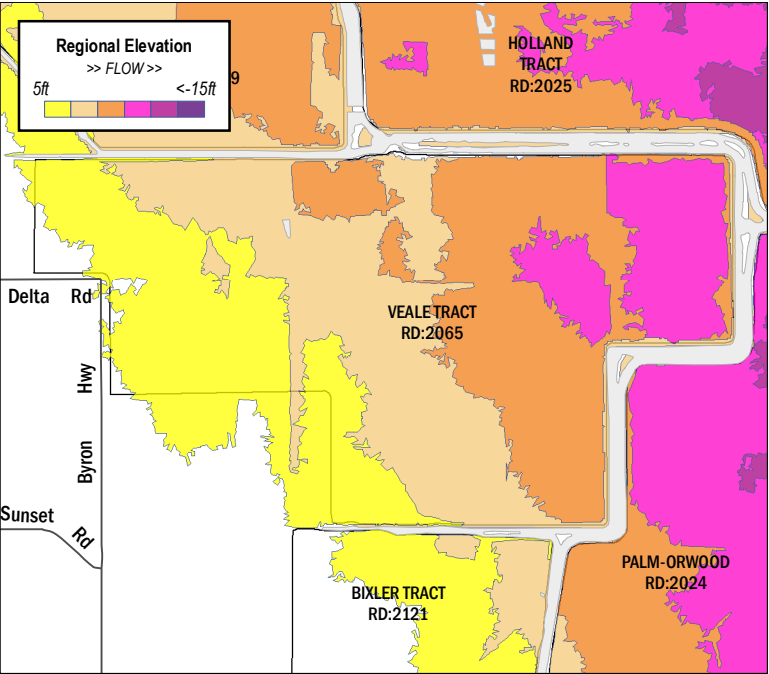
V8 - CRITICAL INFRASTRUCTURE
Critical infrastructure is Delta Road (County road), high voltage power lines traverse through the district, and the Rock Slough Contra Costa Water District (CCWD) intake facility immediately west of District on Rock Slough.

V9 - EVACUATION CONSIDERATIONS
The population of the District does not exceed 20 people during any time of year. Primary land use is agriculture.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

V1 - HIGH WATER EVENT
Multiple high water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Vulnerable area approx.. 2,000 FT. Muscle wall or temporary earthen levee is recommended.

ACTIONS

1. Activate workforce for levee patrols - regular scheduled levee patrols depending on the severity of the event.
 2. Deploy flood fight materials to prevent levee degradation. Prepare resources for temporary earthen levee or muscle wall (utilize borrow material on site, if necessary).
- Muscle Wall Material Required:
2000 feet of temporary levee will require approximately 334 segments of muscle wall, 3340 sandbags, and 1670 cubic feet of sand.
OR
Temporary Earthen Levee Material Required:
2000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 40 rolls of 10 mil plastic sheeting, 600 sandbags, and 90 cubic yards of fill.
Approximately 11.1 cubic yards of fill for sand bags and 78.9 cubic yards of fill for visqueen fill.

V2 - BOIL FROM SEEPAGE THROUGH LEVEE
Boil events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Not associated with wind generated waves and erosion. Response to boils require sack ring, or boil ring, to control water flow and pressure through levee to minimize transport of fine material through seepage that has uncontrolled flow of water and transport of levee material. Tides and low pressure can play a part in both wind and seepage impact potential.

ACTIONS

1. Protect and isolate seepage area with boil sack ring.

C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

FLOOD FIGHT LABOR

| | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |
|--|-------------------------------------|-------------------------------------|

REPAIR CONTRACTORS

| | | | |
|--|---|--|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |
|--|---|--|---|

MATERIALS SUPPLIERS

| | | |
|--|---|--|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 | |

LOCAL SUPPLY PROVIDERS

| | | |
|--|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 | |

Veale Tract

RD 2065

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate | Highway | Major Road | Local Road | Trail, Major | Trail

FLOOD CONTINGENCY OPTIONS

D3 Flood Contingency Option

D2 Special Flood Consideration

LEVEE INFORMATION

1000-Foot Levee Stationing

Levee Centerline

Tide Gate

Levee Access Point

Agricultural Return Drain/Siphon

Levee Crossing

RESPONSE INFORMATION

Structure

T (type)

[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]

(count) - [Approx. Structure Count]

Boat Landing

Supply Delivery Point

Field Stockpile

Flood Fight Material

Helispot

Supply Staging

Command Post

Command Post Secondary

Pump Station

Pump Station Agricultural

REFERENCE INFORMATION

Ferry

Potable Water Facility

Solid Waste Facility

Hazardous Material

Communication Facility

Waster Water Facility

Natural Gas Facility

UG Underground Power Line

Transmission Line

UG Underground Gas Line

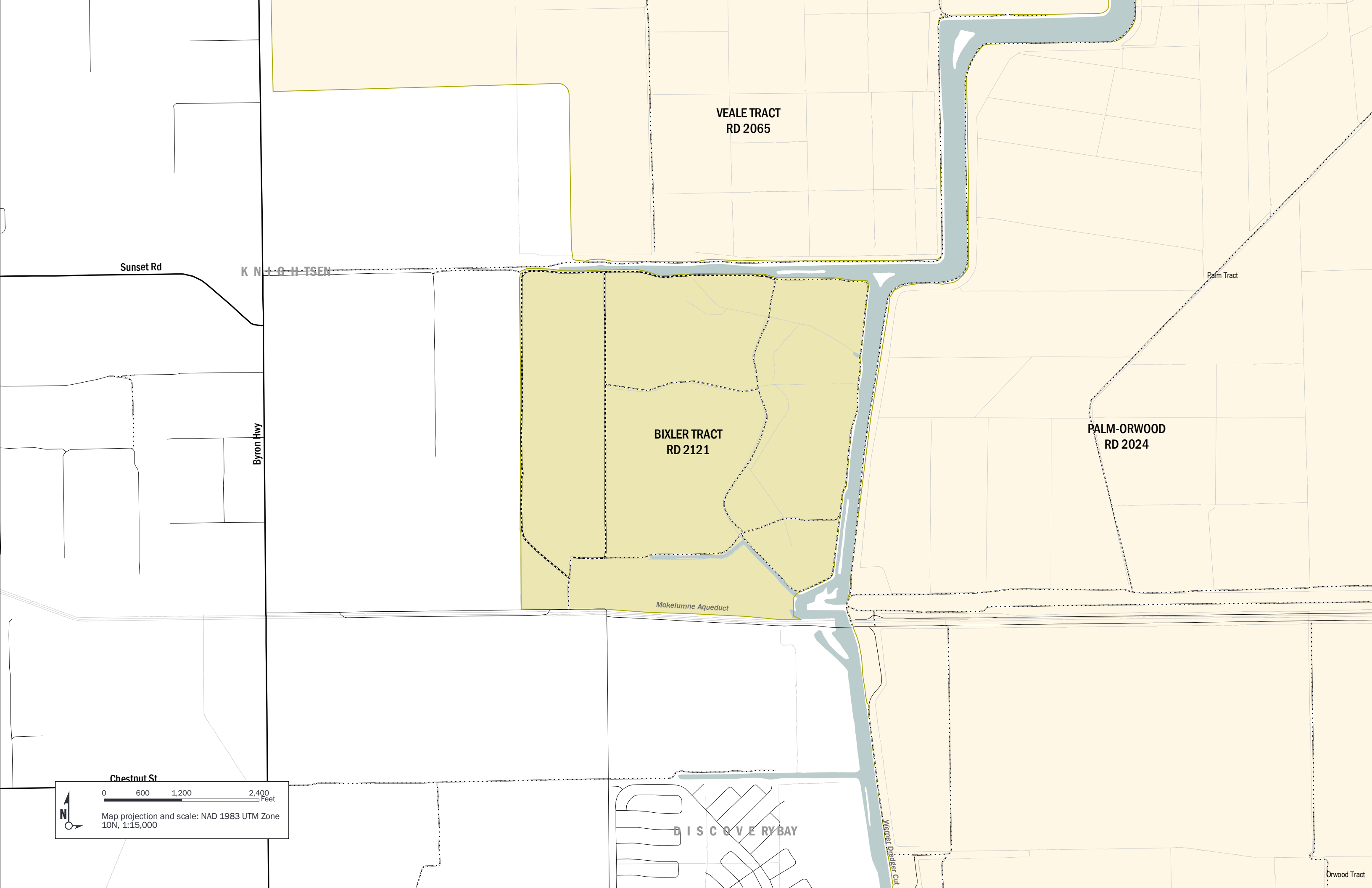
County Boundary

0 550 1,100 2,200 Feet

Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:15,100

Bixler TractRD 2121





VEALE TRACT
RD 2065

Sunset Rd

K N I G H T S E N

Palm Tract

Byron Hwy

BIXLER TRACT
RD 2121

PALM-ORWOOD
RD 2024

Mokelumne Aqueduct

Wentz Polder Cut

Orwood Tract

D I S C O V E R Y B A Y

Chestnut St



0 600 1,200 2,400 Feet

Map projection and scale: NAD 1983 UTM Zone 10N, 1:15,000

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

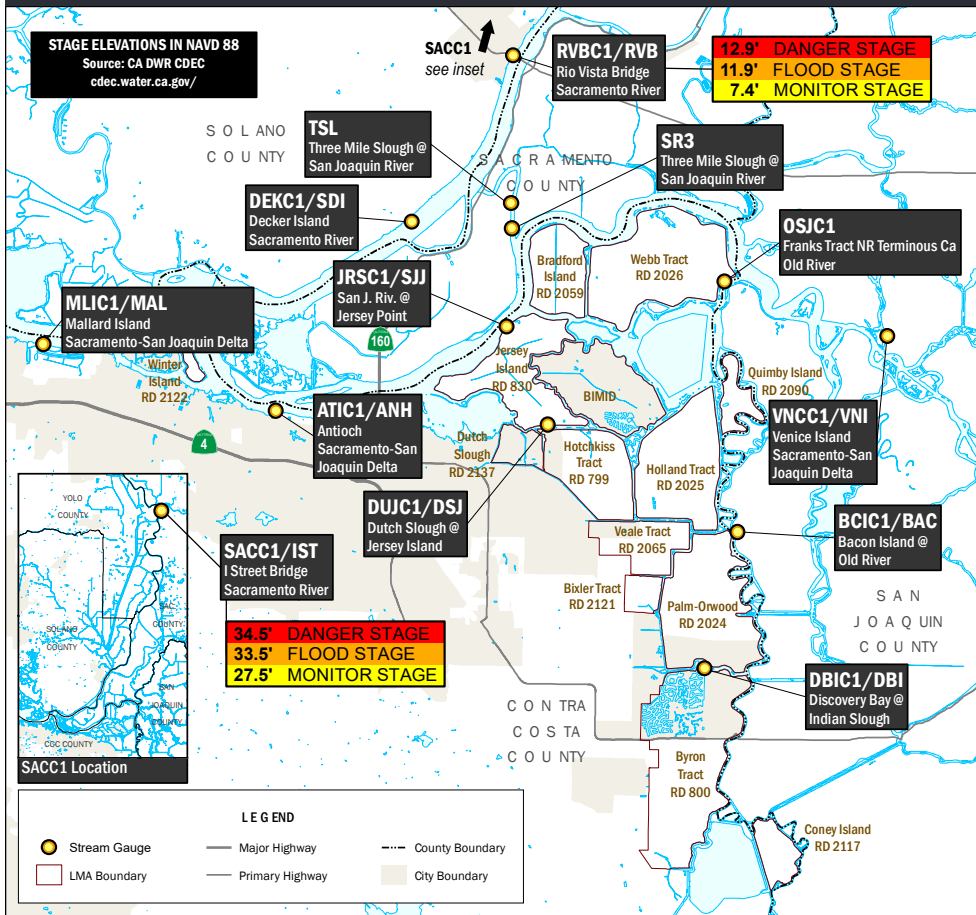
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|-------------------------------------|--|---|
| SACC1/IST I Street Bridge | RVBC1/RVB Rio Vista Bridge | DEKC1 Decker Island |
| MLIC1/MAL Mallard Island | JRSC1/SJJ SJ Riv. @ Jersey Pt | OSJC1 Franks Tract, Terminous |
| ATIC1/ANH Antioch | DUJC1/DSJ Dutch Slough @ Jersey Island | VNCC1/VNI Venice Island |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

No Known Staging Areas in Map Extent

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

No Known Supply Delivery Points in Map Extent

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

No Known Stockpile Resources in Map Extent

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

LARGE EQUIPMENT
(1) Cat D6 dozer (1) Cat D4 dozer (1) Small Backhoe
37°56'34.49180040"N, 121°37'29.99180640"W

TRAILERS
Small equipment/material hauling trailers.
37°56'35.44395720"N, 121°37'27.34019400"W

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

No Known HazMat Locations in Map Extent

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY OFFICE OF EMERGENCY SERVICES

CCC OES
925-228-5000, 24-HOUR

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.427.8562

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
916.574.2619

CALTRANS

Evacuation/Bridge Support
916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell

JERSEY ISLAND (RD 830)

Chad Davidson
925.625.2279
ER Contact
925.727.2938

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

DUTCH SLOUGH (RD 2137)

Nate Hershey
916.456.4400

PALM-ORWOOD TRACT (RD 2024)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

HOLLAND TRACT (RD 2025)

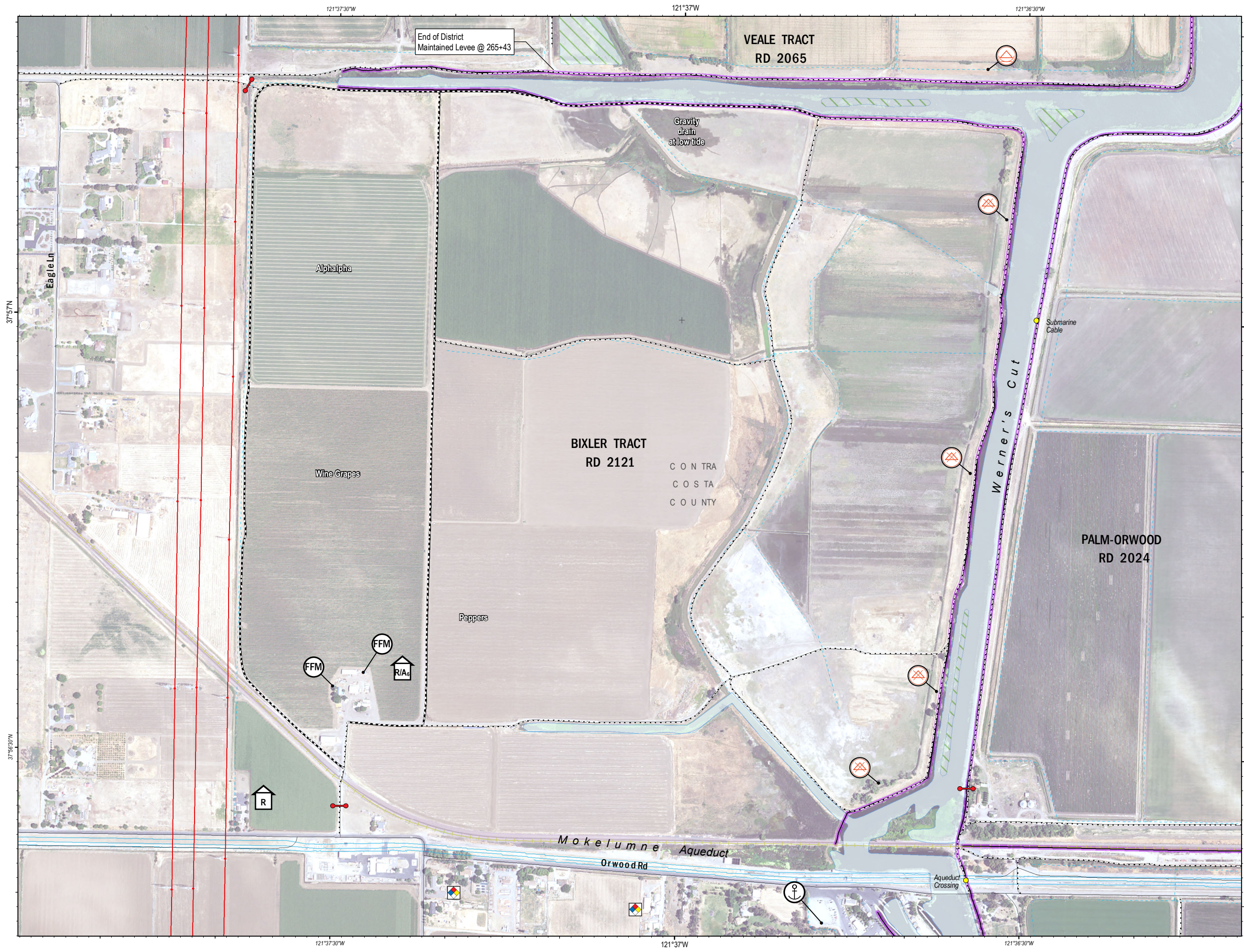
David A. Forkel
925.932.0251
925.693.9977

WEBB TRACT (RD 2026)

Al Warren Hoslett
209.943.5551, Bus.

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300



Bixler Tract

RD 2121

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

LEVEE INFORMATION

1000-Foot Levee Stationing

Levee Centerline

Tide Gate

Levee Access Point

Historic Levee Breach

Levee Erosion

Levee Seepage

Agricultural Return Drain/Siphon

Levee Crossing

RESPONSE INFORMATION

Structure

Boat Landing

Supply Delivery Point

Field Stockpile

Flood Fight Material

Supply Staging

T (type)
[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]

REFERENCE INFORMATION

Fire Station

Home Care

Ferry

Hazardous Material

School

Ag. Worker Camp

Dam

Underground Power Line

Transmission Line

Underground Gas Line

County Boundary

0 295 590 1,180 Feet

Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:7,700

FLOOD CONTINGENCY PLANNING INFORMATION

A.1. SPECIAL FLOOD CONSIDERATIONS

X1 - WORKER'S CAMP
Typical population on Bixler Tract totals approx. 9 People. Mostly seasonal Workers. Seasonal worker dwelling units are located at the highest elevations on the tract above most flood threat.

X2 - MATERIAL STORAGE
6 Structures with Conex Boxes for material storage. Storage includes diesel Fuel, pesticides, herbicides, hydraulic Fluids. All HazMat below thresholds for reporting to County.

X3 - GATED ENTRY
Location can be used to access levee and Bixler Tract.

X4 - EMERGENCY ACCESS GATE
If needed property can bed accessed with proper entry keys / combo

X5 - INTAKE PUMP
In-take pump for irrigation supply. Two pipe intake with back flow for low tide. Sand media filters for micro filtration.

X6 - CATTLE POPULATION
~ 200 Head of cattle may reside in this area. Fenced off from rest of Bixler Track via fence and gate system. Fence runs length of drainage area in the center of the Tract.

X7 - BOAT TRAFFIC
Over 1,000 boats are launched at Orwood Resort. This causes wave action in Werner Cut.

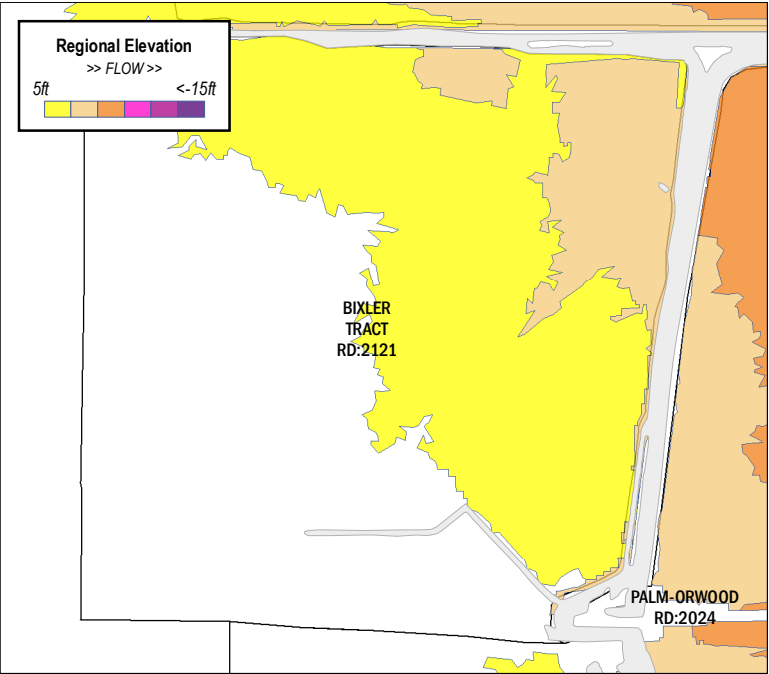
X8 - ANIMAL BURROWS
Animal burrows have caused boil or levee seepage points in 1999 when there was a 20 gallons per minute (G.P.M.) leak from the burrows.

X9 - LEVEE STATUS
Bixler Tract levees are not certified although elevation height exceeds standards at 11’3”. Bixler Tract consists of one square mile of property with two miles of levees. The highest levee crown elevation is 14’.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

X1 - WIND WAVES

Wind waves 1.5 FT in height could occur at this location. Wind waves causing erosion will lead to levee failure if not addressed for long periods of time; protection area approx. 300 FT.

ACTIONS

1. Protect area exposed to wind waves with envelope style wrap. Wave Wash Protection Material Required: 300 feet of envelope wave wash will require approximately 6 rolls of 10 mil plastic sheeting, 90 sandbags, 45 cubic feet of sand, 6 rolls of twine, 30 plastic buttons or rocks, and 60 [1” x 3” x 2’] stakes.

X2 - HIGH WATER EVENT

Multiple high water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. East side of Bixler Tract Levee System may be lower than regional high water event. Vulnerable area approx.. 5,000 FT. Muscle wall or temporary earthen levee is recommended.

ACTIONS

1. Close control gate at intake slough.
2. Activate workforce for levee patrols.
3. Move or evacuate cattle population.
4. Prepare resources for temporary earthen levee or muscle wall. Muscle Wall Material Required: 5000 feet of temporary levee will require approximately 834 segments of muscle wall, 8340 sandbags, and 4170 cubic feet of sand. OR Temporary Earthen Levee Material Required: 5000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 100 rolls of 10 mil plastic sheeting, 1500 sandbags, and 225 cubic yards of fill. Approximately 27.8 cubic yards of fill for sand bags and 197.2 cubic yards of fill for visqueen fill.

C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

FLOOD FIGHT LABOR

| | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |
|--|-------------------------------------|-------------------------------------|

REPAIR CONTRACTORS

| | | | |
|--|--|---|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |
|--|--|---|---|

MATERIALS SUPPLIERS

| | | |
|--|---|---|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
|--|---|---|

| | | |
|--|--|---|
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |
|--|--|---|

| | | |
|--|---|--|
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |
|--|---|--|

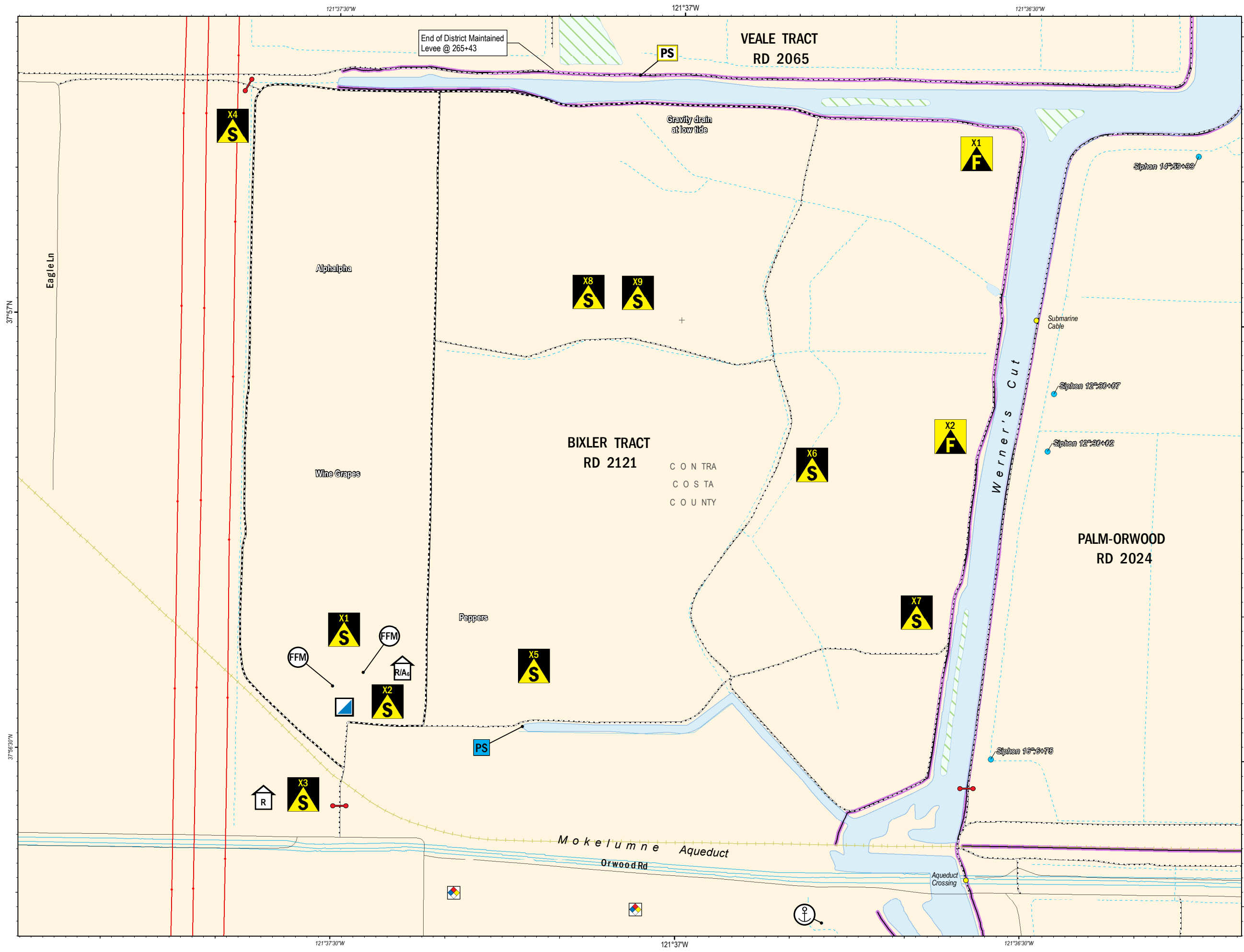
| | | |
|--|--|--|
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 | |
|--|--|--|

LOCAL SUPPLY PROVIDERS

| | | |
|---|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
|---|---|--|

| | | |
|--|---|--|
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |
|--|---|--|

| | | |
|--|--|--|
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 | |
|--|--|--|



Bixler Tract

RD 2121

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

- Gate
- ROADS
 - Interstate
 - Highway
 - Major Road
 - Local Road
 - Trail, Major
 - Trail

FLOOD CONTINGENCY OPTIONS

- D3 Flood Contingency Option
- D2 Special Flood Consideration

LEVEE INFORMATION

- 1000-Foot Levee Stationing
- Levee Centerline
- Tide Gate
- Agricultural Return Drain/Siphon
- Levee Access Point
- Levee Crossing

RESPONSE INFORMATION

- Structure
 - T (type) [A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
 - # (count) - [Approx. Structure Count]
- Boat Landing
- Supply Delivery Point
- Field Stockpile
- Flood Fight Material
- Helispot
- Supply Staging
- Command Post
- Command Post Secondary
- Pump Station
- Pump Station Agricultural

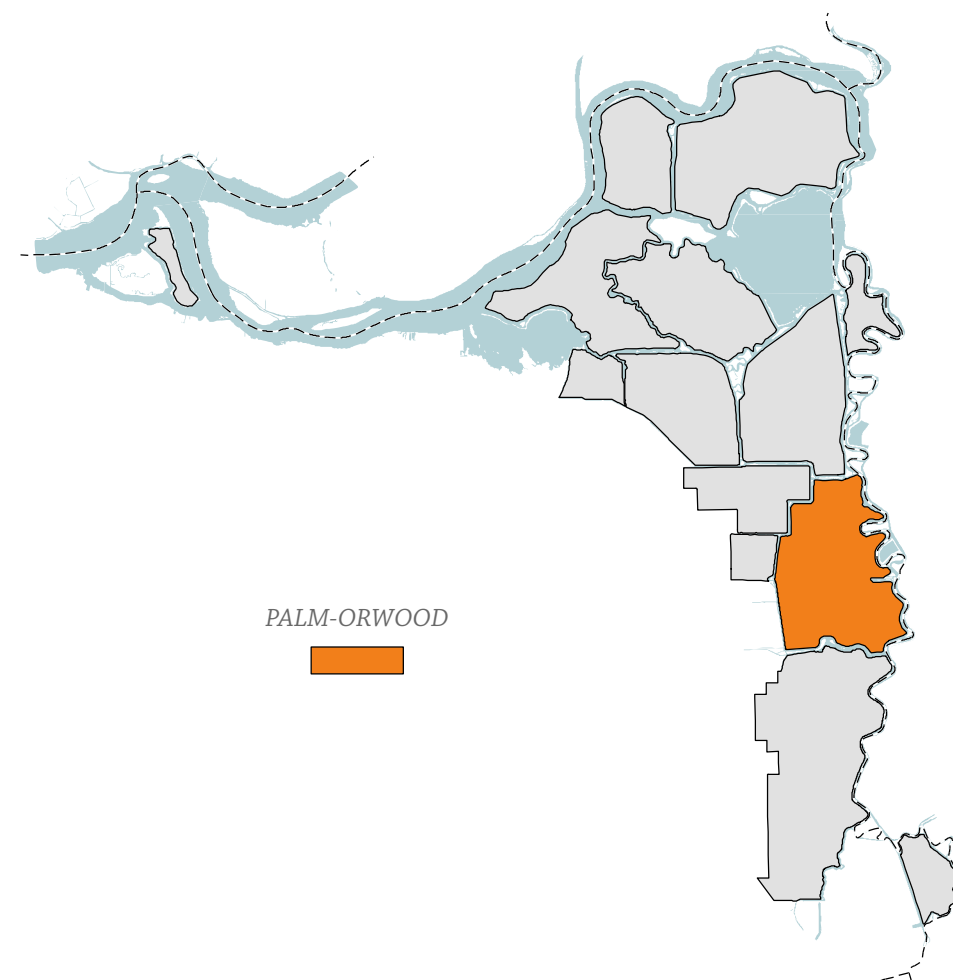
REFERENCE INFORMATION

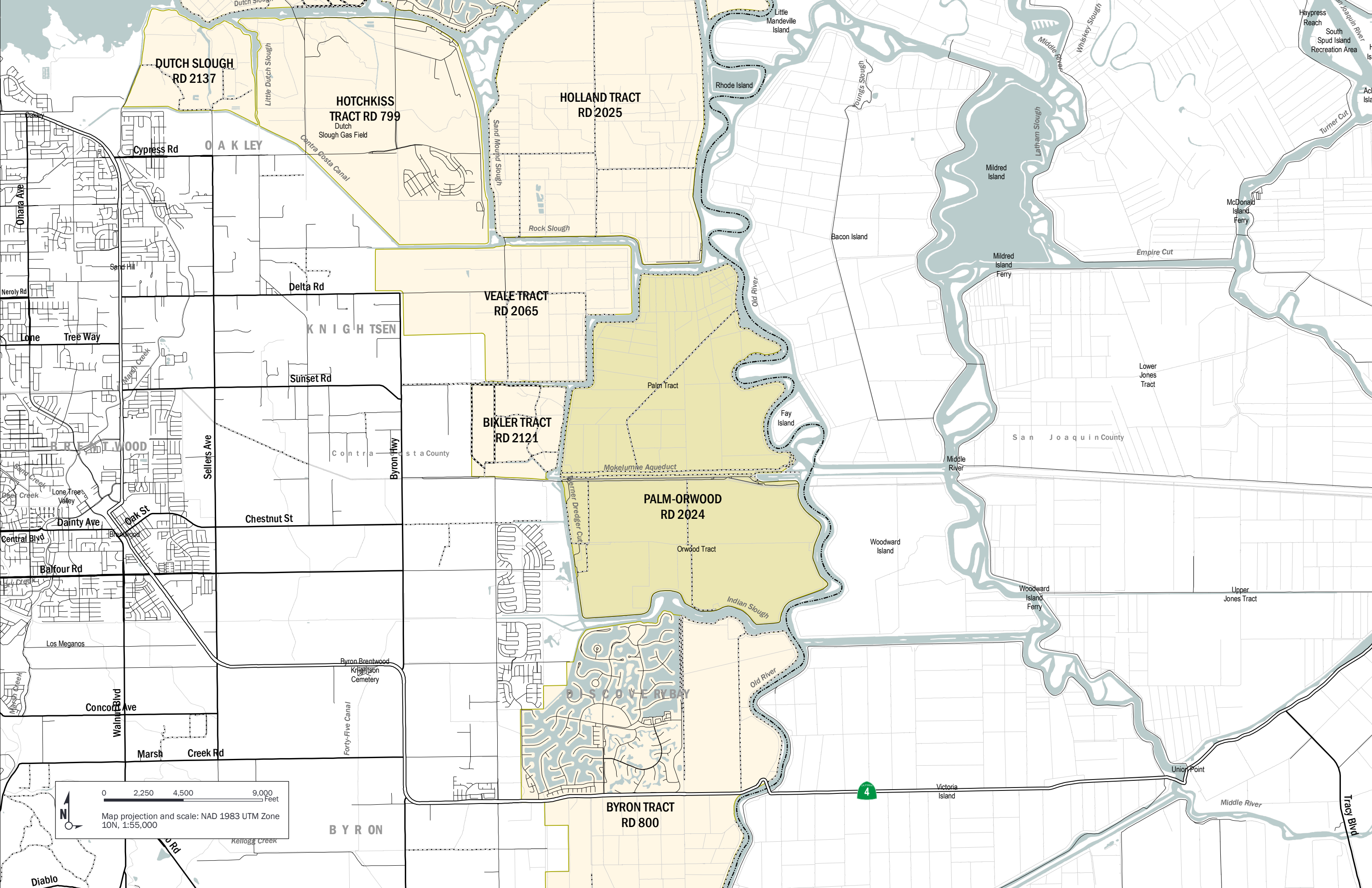
- Ferry
- Potable Water Facility
- Solid Waste Facility
- Hazardous Material
- Communication Facility
- Waster Water Facility
- Natural Gas Facility
- UG - Underground Power Line
- Transmission Line
- UG - Underground Gas Line
- County Boundary



Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:7,700

Palm-Orwood Tract.... RD 2024





DUTCH SLOUGH
RD 2137

HOTCHKISS
TRACT RD 799

HOLLAND TRACT
RD 2025

VEALE TRACT
RD 2065

BIXLER TRACT
RD 2121

PALM-ORWOOD
RD 2024

BYRON TRACT
RD 800

N

0

2,250

4,500

9,000

Feet

Map projection and scale: NAD 1983 UTM Zone 10N, 1:55,000

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

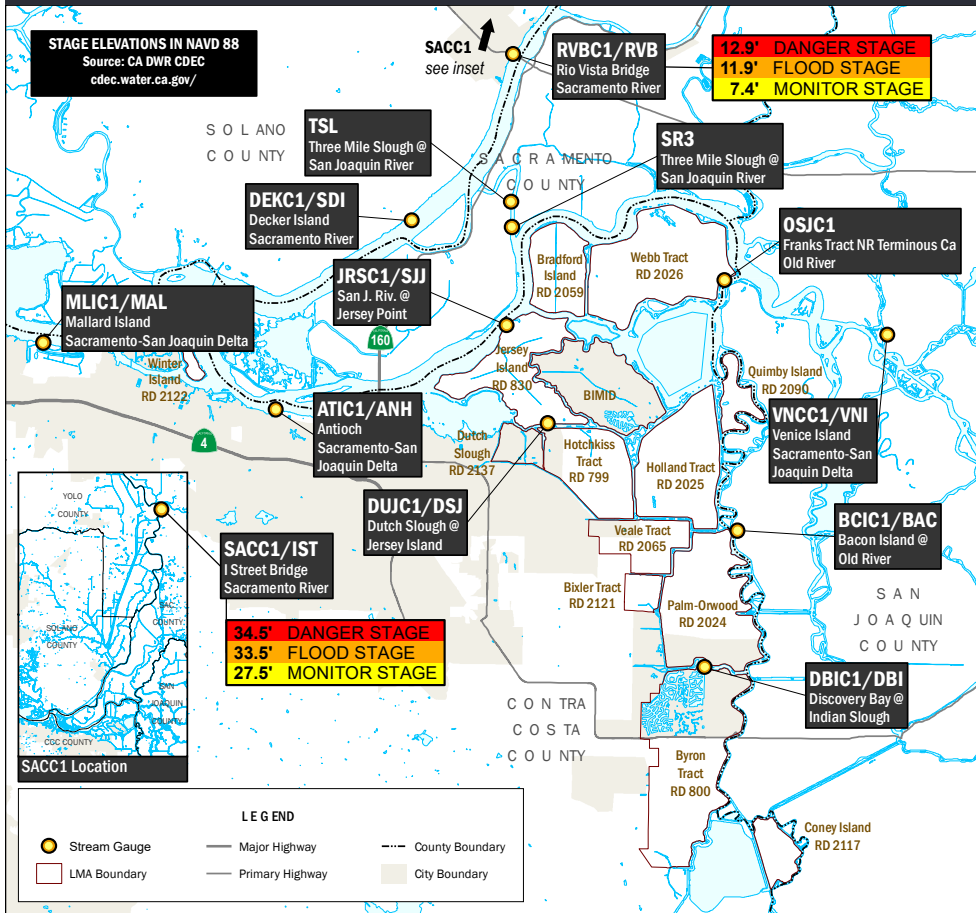
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|---|--|---|
| <div>LIVE CHART</div> <div>SACC1/IST</div> <div>I Street Bridge</div> <div></div> | <div>LIVE CHART</div> <div>RVBC1/RVB</div> <div>Rio Vista Bridge</div> <div></div> | <div>LIVE CHART</div> <div>DEKC1</div> <div>Decker Island</div> <div></div> |
| <div>LIVE CHART</div> <div>MLIC1/MAL</div> <div>Mallard Island</div> <div></div> | <div>LIVE CHART</div> <div>JRSC1/SJJ</div> <div>SJ Riv. @ Jersey Pt</div> <div></div> | <div>LIVE CHART</div> <div>OSJC1</div> <div>Franks Tract, Terminous</div> <div></div> |
| <div>LIVE CHART</div> <div>ATIC1/ANH</div> <div>Antioch</div> <div></div> | <div>LIVE CHART</div> <div>DUJC1/DSJ</div> <div>Dutch Slough @ Jersey Island</div> <div></div> | <div>LIVE CHART</div> <div>VNCC1/VNI</div> <div>Venice Island</div> <div></div> |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

LARGE EQUIPMENT STAGING LOCATION

Heavy equipment staging location on southwest corner of Palm Tract (northern island) north of BNSF Railroad and EMBUD aqueduct.
37°56'28.94415720"N, 121°36'29.58541200"W

POTENTIAL STAGING AREA

Area at set-back levee can be used as a staging area in incident command situation.
37°57'17.33916600"N, 121°34'36.80549040"W

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

GENERAL PRE-PLANNED DELIVERY POINT

EBMUD Bixler maintenance center at Bixler Rd. and Orwood Rd..
37°56'23.17042320"N, 121°37'24.83520240"W

SUPPLY DELIVERY POINT

Potential barge landing area.
37°56'35.63160360"N, 121°33'54.21828600"W

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

RIPRAP STOCKPILE

Riprap stockpile on levee at station 125+70
37°55'04.56795480"N, 121°34'00.45956640"W

RIPRAP STOCKPILE

Riprap stockpile on levee at station 390+00.
37°56'31.46471520"N, 121°33'49.06715400"W

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

FLOOD FIGHT MATERIALS

Various pre-staged flood fight materials at EBMUD yard.
37°56'23.19090000"N, 121°37'24.82121640"W

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

LAS SERPIENTES

Air Minor
Southern end of Orwood Resort
37°55'59.16000000"N, 121°36'46.44000000"W
JM TRANSPORT
Transporter
4451 Orwood Rd
37°56'08.48400360"N,

ORWOOD RESORT

Community Water System
4451 Orwood Rd
37°56'13.70470920"N, 121°36'42.13856880"W
DOS AMIGOS LANDSCAPE
Transporter
4251 Orwood Rd

EBMUD BIXLER CHLORINATION FACILITY

Hazardous Waste Biennial Reporter/ SQG
Orwood Road And Bixler Road
37°56'20.36112720"N, 121°37'19.27057440"W

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.313.2000

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.313.2000

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
800.952.5530

CALTRANS

Evacuation/Bridge Support
916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/ Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

DUTCH SLOUGH (RD 2137)

Nate Hershey
916.456.4400

PALM-ORWOOD TRACT (RD 2024)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

HOLLAND TRACT (RD 2025)

David A. Forkel
925.932.0251
Bus. 925.693.9977
Bus. Cell

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

JERSEY ISLAND (RD 830)

Chad Davidson 925.625.2279
ER Contact 925.727.2938

WEBB TRACT (RD 2026)

Al Warren Hoslett
209.943.5551, Bus.

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300

Palm-Orwood Tract

RD 2024

The symbology presented in the legend below is global to the project area. Some symbols may not be present on map.

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

EVACUATION

Rally Point

EVACUATION ROUTES

Major Road Local Road

LEVEE INFORMATION

1000-Foot Levee Stationing
Levee Centerline

Tide Gate
Levee Access Point
Historic Levee Breach
Levee Erosion
Levee Seepage
Agricultural Return Drain/Siphon
Levee Crossing

RESPONSE INFORMATION

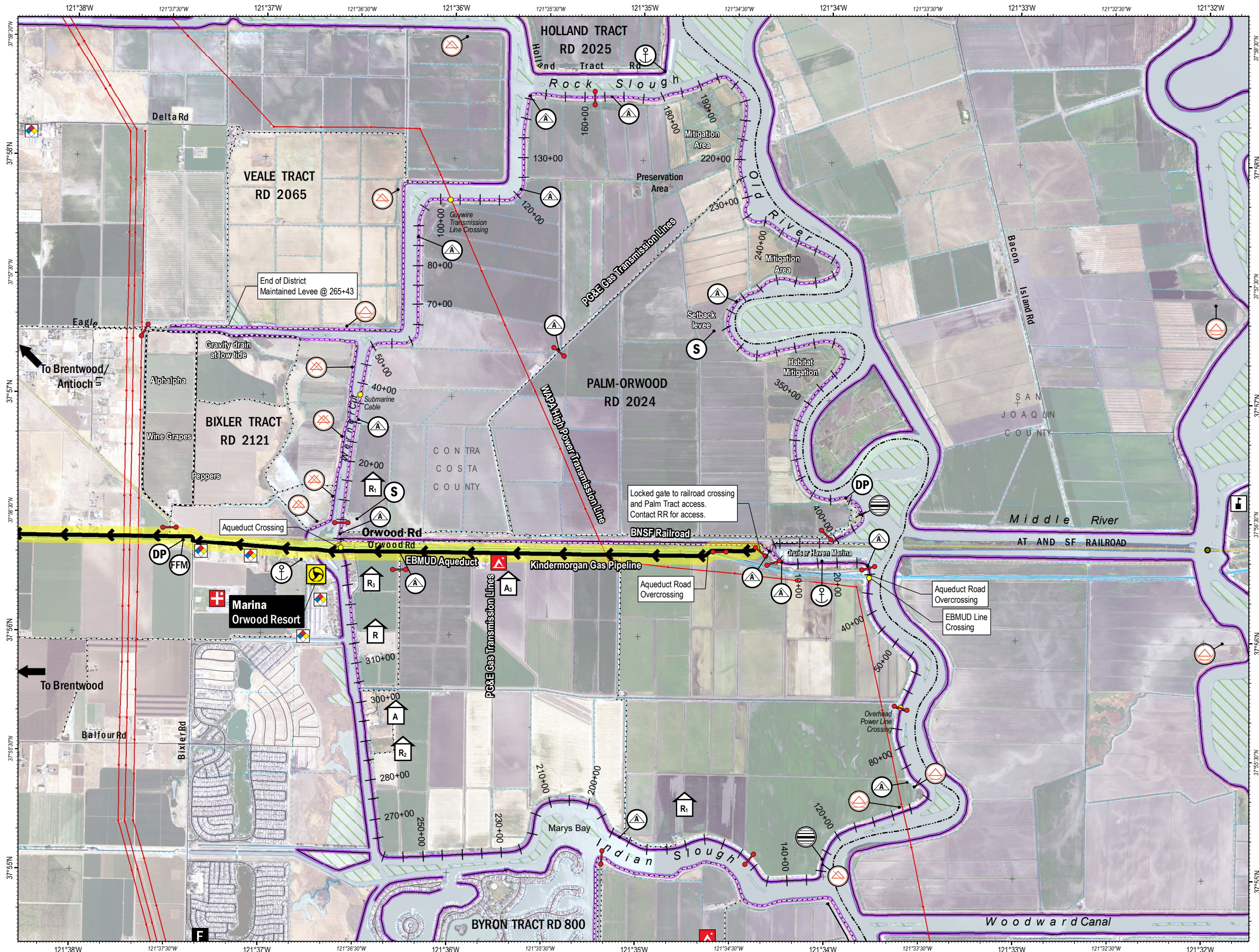
Structure
Boat Landing
Supply Delivery Point
Field Stockpile
Flood Fight Material
Supply Staging
T (type)
[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]

REFERENCE INFORMATION

Fire Station
Home Care
Ferry
Hazardous Material
School
Ag. Worker Camp
Dam
Underground Power Line
Transmission Line
Underground Gas Line
County Boundary

0 1,050 2,100 4,200 Feet

Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:28,300



FLOOD CONTINGENCY PLANNING INFORMATION

A.1. SPECIAL FLOOD CONSIDERATIONS

P1 - BOAT TRAFFIC
Over 1,000 boats are launched at Orwood Resort. This causes wave action in Werner Cut.

P2 - LEVEE LOADING
The RD 2024 levees are considered frequently loaded levees because they are subject to the tidal fluctuations of the Delta. The RD 2024 levees protect land that is between -12 and -16 Ft. below sea level and constantly holding back the river and sloughs. In the event of a levee breach, the entire island will fill with water until the levee is repaired.

P3 - EVACUATION CONSIDERATIONS
There are approximately thirty (30) to fifty (50) residents which permanently live on Palm and Orwood Tracts and approximately fifty (50) seasonal farm workers on Palm and Orwood Tracts. Depending on the crops, seasonal farm workers could swell this number to over two hundred plus (200+). The number also increases substantially when work is being performed by EBMUD or Kinder Morgan. Additionally, the risk to operators and passengers could be as high as 300 or more people on a passenger train. At any given time, one hundred (100) to six hundred (600) people may need to be evacuated during a flood event.

P4 - EAST BAY MUNICIPAL UTILITY DISTRICT AQUEDUCTS (EBMUD AD)
The EBMUD AD transverse through Orwood Tract and crosses the levees near Orwood Tracts levee stations 0+00 and 372+75. Extensive damage and disruption of service to the EBMUD AD would be expected in the event of a flood on Orwood Tract. Due to the proximity of the levees to the pipelines, a levee break could result in undermining the aqueduct supports, thereby causing a failure of the pipelines. In a typical levee break, the water rushing to fill the Island will scour a deep hole extending outward from the location of the levee. In addition, the aqueducts do not appear to be adequately protected from corrosion, wave impacts, or buoyancy caused by submergence. If the eastern or western levees were breached near the EBMUD AD levees crossings, scour damage to the footings on EMBUD AD could be significant. If flooding is imminent or occurs and EBMUD’s facilities are possibly threatened, contact EBMUD at (209) 946-8001.

P5 - BURLINGTON NORTHERN SANTA FE RAILROAD (BNSF)
The BNSF Railroad transverses thorough the middle Palm and Orwood Palm Tracks from east to west. The railroad is built on an embankment designed only for the use of the railroad. The embankment is not designed to retain water and if the tract floods there could be a high risk of the embankment eroding. This railroad is the main east and west Rail route for a majority of the goods shipped from the Bay Area to the Central Valley as well as a major commuter service. As evidenced from the 1980 flood of Lower Jones Tract, the BNSF Railroad experiences extensive damage due erosion, wave wash, and seepage. If flooding is imminent or occurs and BNSF’s embankment and facilities are possibly threatened, contact BNSF at (209) 942-5438.

P6 - KINDER MORGAN FUEL TRANSMISSION LINE
Palm and Orwood Tracts protects the Kinder Morgan fuel transmission line that carries gasoline and aviation fuel from Bay Area refineries to critical locations including military installations. This pipeline is adjacent to the EBMUD aqueduct. If flooding is imminent or occurs and Kinder Morgan’s facilities are possibly threatened, contact Kinder Morgan at 1-800-733-2490.

P7 - WESTERN AREA POWER ASSOCIATION (WAPA)
The WAPA electrical transmission lines cross Palm and Orwood Tracts. These lines are an important component to the electrical grid for California. In the event of a flood the integrity of the supports could be jeopardized due to saturation of the foundations and exposure to navigation on the resulting open water.

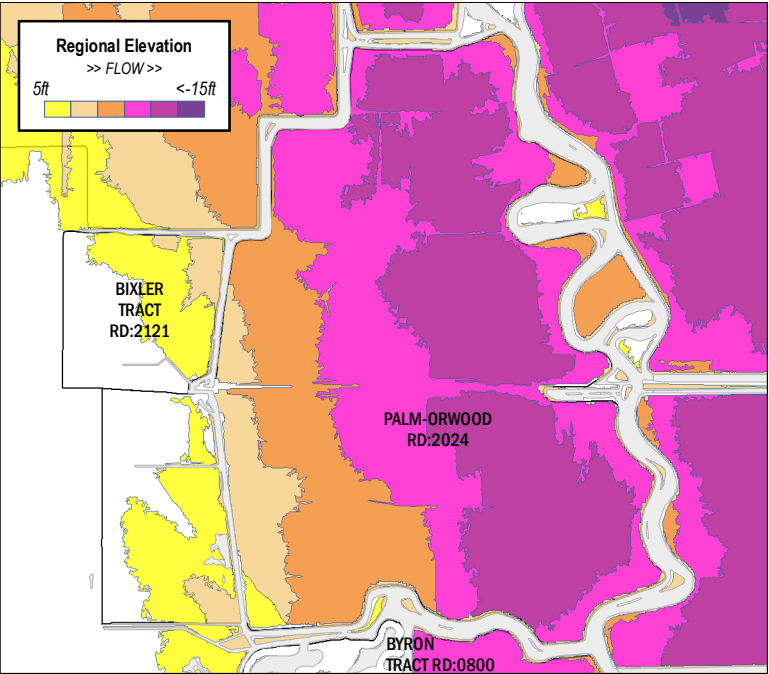
P8 - PG&E GAS TRANSMISSION LINE 57A/57B/57C
There is a major gas transmission line that crosses Palm and Orwood Island. This line carries natural gas between the PG&E McDonald Island gas storage facilities. If flooding is imminent or occurs and PG&E’s facilities are possibly threatened, contact PG&E at 1-800-743-5000.

P9 - RD 2024 DRAINAGE SYSTEM
The land is below the level of the waterbody and requires pumps to get the drainage off the tract. An extended interruption of electrical service will cause water to backup and rise in the RD ditches. There are existing pump stations within the RD’s jurisdictional boundary and located at Palm Tract’s levee stationing. Additional pumps and generators will be brought in during a flood event and place at the existing drainage swale located at the existing pump station. RD Engineer shall determine the size of pumps.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

P1 - HIGHWATER EVENT @ STATION 200+00 TO 260+00
Adding Splash Cap and material to levee.
ACTIONS
Station 200+00-260+00 levee vulnerabilities - AB mix on trucks 6000 feet of splash cap (3’ high [18” compacted] x 9.5’ wide) will require approximately 1875 tons of AB mix equaling 75 truck loads at 25 tons/truck load. Half Distance: 3000 feet of splash cap (3’ high [18” compacted] x 9.5’ wide) will require approximately 938 tons of AB mix equaling 38 truck loads at 25 tons/truck load.

P2 - HIGHWATER EVENT @ STATION 335+00-400+00
Adding Splash Cap and material to levee.
ACTIONS
Station 335+00-400+00 levee vulnerabilities - AB mix on trucks 6500 feet of splash cap (3’ high [18” compacted] x 9.5’ wide) will require approximately 2031 tons of AB mix equaling 82 truck loads at 25 tons/truck load. Half Distance: 3250 feet of splash cap (3’ high [18” compacted] x 9.5’ wide) will require approximately 1016 tons of AB mix equaling 41 truck loads at 25 tons/truck load.

C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

| FLOOD FIGHT LABOR | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |

REPAIR CONTRACTORS

| | | | |
|--|---|--|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |
|--|---|--|---|

MATERIALS SUPPLIERS

| | | |
|--|---|--|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |

| | |
|--|--|
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 |
|--|--|

LOCAL SUPPLY PROVIDERS

| | | |
|--|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 | |

Palm-Orwood Tract

RD 2024

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

FLOOD CONTINGENCY OPTIONS

D3 Flood Contingency Option P1 Special Flood Consideration

LEVEE INFORMATION

1000-Foot Levee Stationing
Levee Centerline
Tide Gate
Levee Access Point
Agricultural Return Drain/Siphon
Levee Crossing

RESPONSE INFORMATION

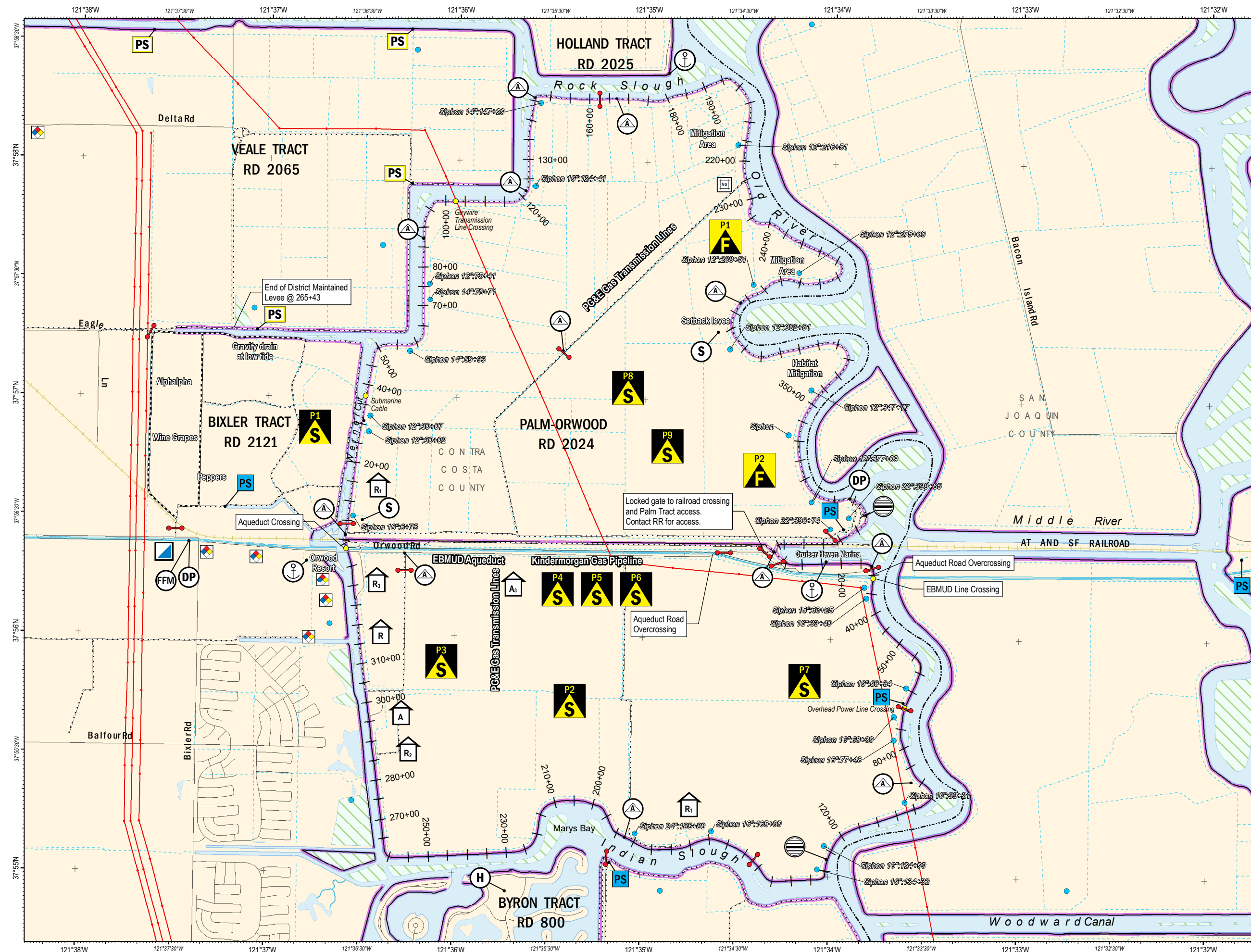
Structure
Boat Landing
Supply Delivery Point
Field Stockpile
Flood Fight Material
Helispot
Supply Staging
Command Post
Command Post Secondary
Pump Station
Pump Station Agricultural

REFERENCE INFORMATION

Ferry
Potable Water Facility
Solid Waste Facility
Hazardous Material
Communication Facility
Waster Water Facility
Natural Gas Facility
Underground Power Line
Transmission Line
Underground Gas Line
County Boundary

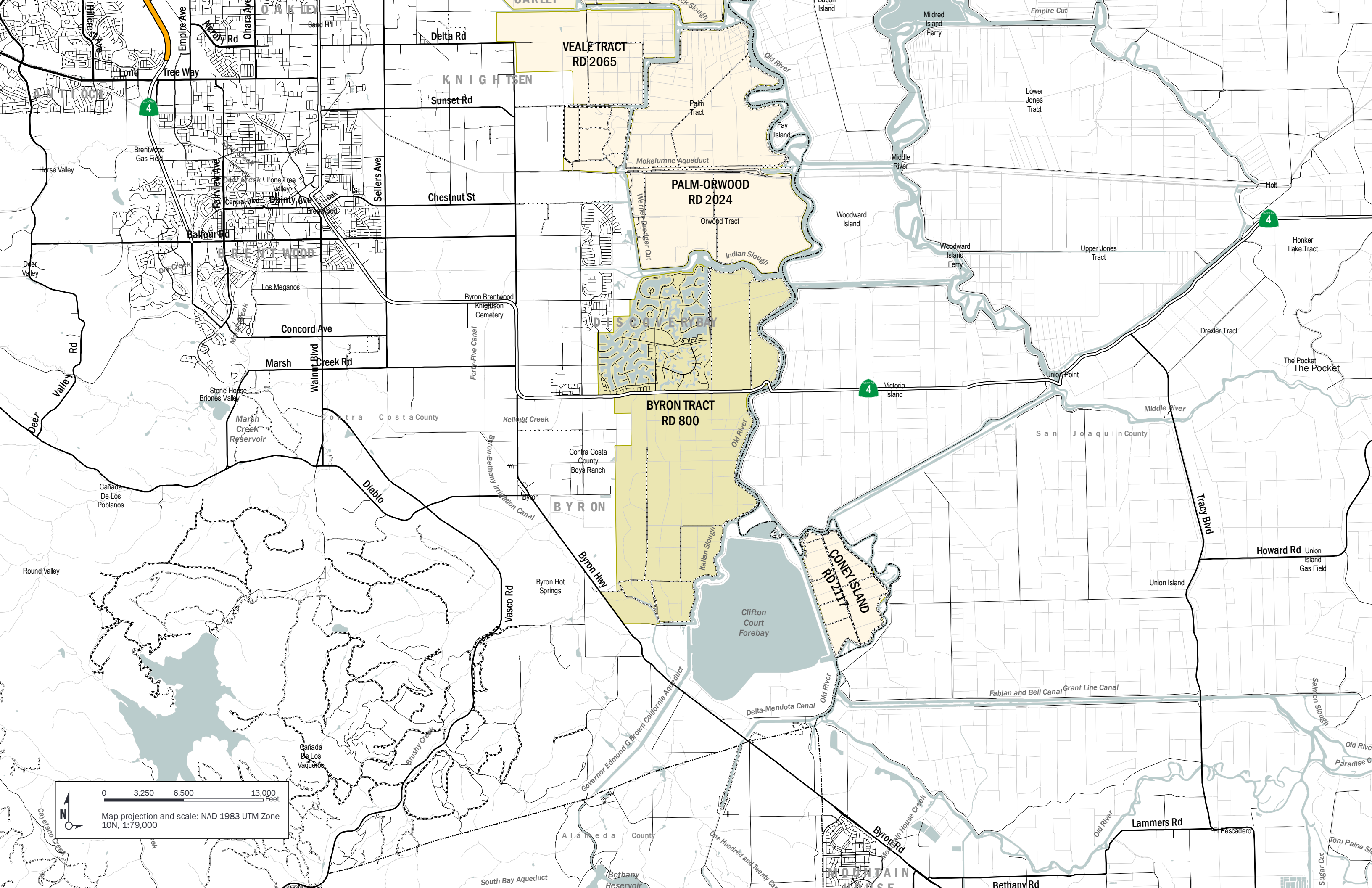
0 1,050 2,100 4,200 Feet

Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:28,300



Byron Tract..... RD 800





0 3,250 6,500 13,000 Feet

Map projection and scale: NAD 1983 UTM Zone 10N, 1:79,000

EVACUATION / RESCUE INFORMATION

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

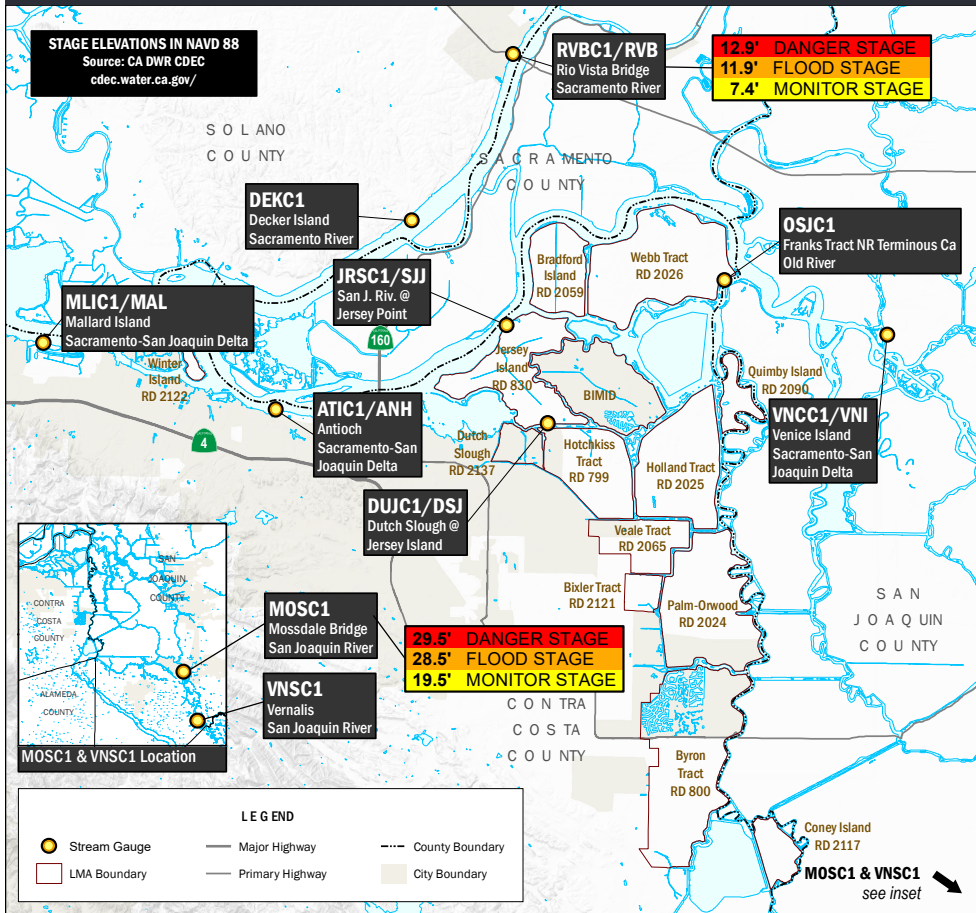
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|---|--|---|
| <div>LIVE CHART</div> <div>SACC1/IST</div> <div>I Street Bridge</div> <div></div> | <div>LIVE CHART</div> <div>RVBC1/RVB</div> <div>Rio Vista Bridge</div> <div></div> | <div>LIVE CHART</div> <div>DEKC1</div> <div>Decker Island</div> <div></div> |
| <div>LIVE CHART</div> <div>MLIC1/MAL</div> <div>Mallard Island</div> <div></div> | <div>LIVE CHART</div> <div>JRSC1/SJJ</div> <div>SJ Riv. @ Jersey Pt</div> <div></div> | <div>LIVE CHART</div> <div>OSJC1</div> <div>Franks Tract, Terminous</div> <div></div> |
| <div>LIVE CHART</div> <div>ATIC1/ANH</div> <div>Antioch</div> <div></div> | <div>LIVE CHART</div> <div>DUJC1/DSJ</div> <div>Dutch Slough @ Jersey Island</div> <div></div> | <div>LIVE CHART</div> <div>MOSC1/MSD</div> <div>Mossdale Bridge</div> <div></div> |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

| | |
|---|--|
| <div>STAGING AREA</div> <div>South Byron Tract staging in open area on levee road. 37°50'29.18400360"N, 121°36'12.25440000"W</div> | <div>EAST STAGING</div> <div>Staging at levee access along Old River. 37°54'11.47394880"N, 121°34'25.71664440"W</div> |
| <div>STAGING</div> <div>Staging near pump station south of Hwy 4 and WWTP on Old River. 37°53'05.54230680"N, 121°34'36.07440960"W</div> | <div>NORTH STAGING</div> <div>Staging on levee road on north end of Byron Tract. 37°55'02.22238560"N, 121°35'08.98527840"W</div> |

DP B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

| |
|---|
| <div>SUPPLY DELIVERY</div> <div>Delivery point at yard/shed at 4250 Camino Diablo. 37°52'04.50225120"N, 121°36'56.68957080"W</div> |
| <div>DELIVERY POINT CP1</div> <div>Delivery point in open space at Sand Point Rd. & Discovery Bay Blvd. 37°54'07.91445600"N, 121°36'15.00909840"W</div> |

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

No Known Stockpile Resources in Map Extent

FFM B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

| |
|---|
| <div>FLOOD FIGHT MATERIALS</div> <div>DWR recommended flood fight materials at yard/shed at 4250 Camino Diablo. 37°52'04.87822800"N, 121°36'58.10257080"W</div> |
|---|

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

| | |
|--|--|
| <div>DISCOVERY BAY WWTP</div> <div>POTW, Icis-Npdes Major Hwy 4 & Channel Road 37°53'36.07233360"N, 121°35'15.82580760"W</div> | <div>DISCOVERY BAY YACHT HARBOR</div> <div>SPCC, Enf./Compliance Activity 5901 Marina Road 37°54'08.58683520"N, 121°35'15.80786880"W</div> |
|--|--|

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

| | |
|--|---|
| <div>CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT</div> <div>Evacuation 925.335.1500, Information 925.646.2441, Emergency</div> | <div>CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT</div> <div>Evacuation/Rescue 925.941.3330</div> |
| <div>CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT</div> <div>Debris Management 925.313.2000</div> | <div>CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT</div> <div>Debris Management 925.313.2000</div> |

COUNTY ICS/EOC OPS

| | | |
|--|---|---|
| <div>CONTRA COSTA COUNTY</div> <div>925.646.4461, Office 925.228.5000, 24-Hour</div> | <div>SAN JOAQUIN COUNTY</div> <div>209.953.6200, Office, 209.468.4400 Emergency</div> | <div>YOLO COUNTY</div> <div>530.406.4930, Office 530.666.8920 24-Hour</div> |
| <div>SACRAMENTO COUNTY</div> <div>916.874.4670, Office 916.875.5000, Night 916.875.6900, Night</div> | <div>SOLANO COUNTY</div> <div>707.784.1600, Office 707.421.7090, Night</div> | |

RESPONSE SUPPORT

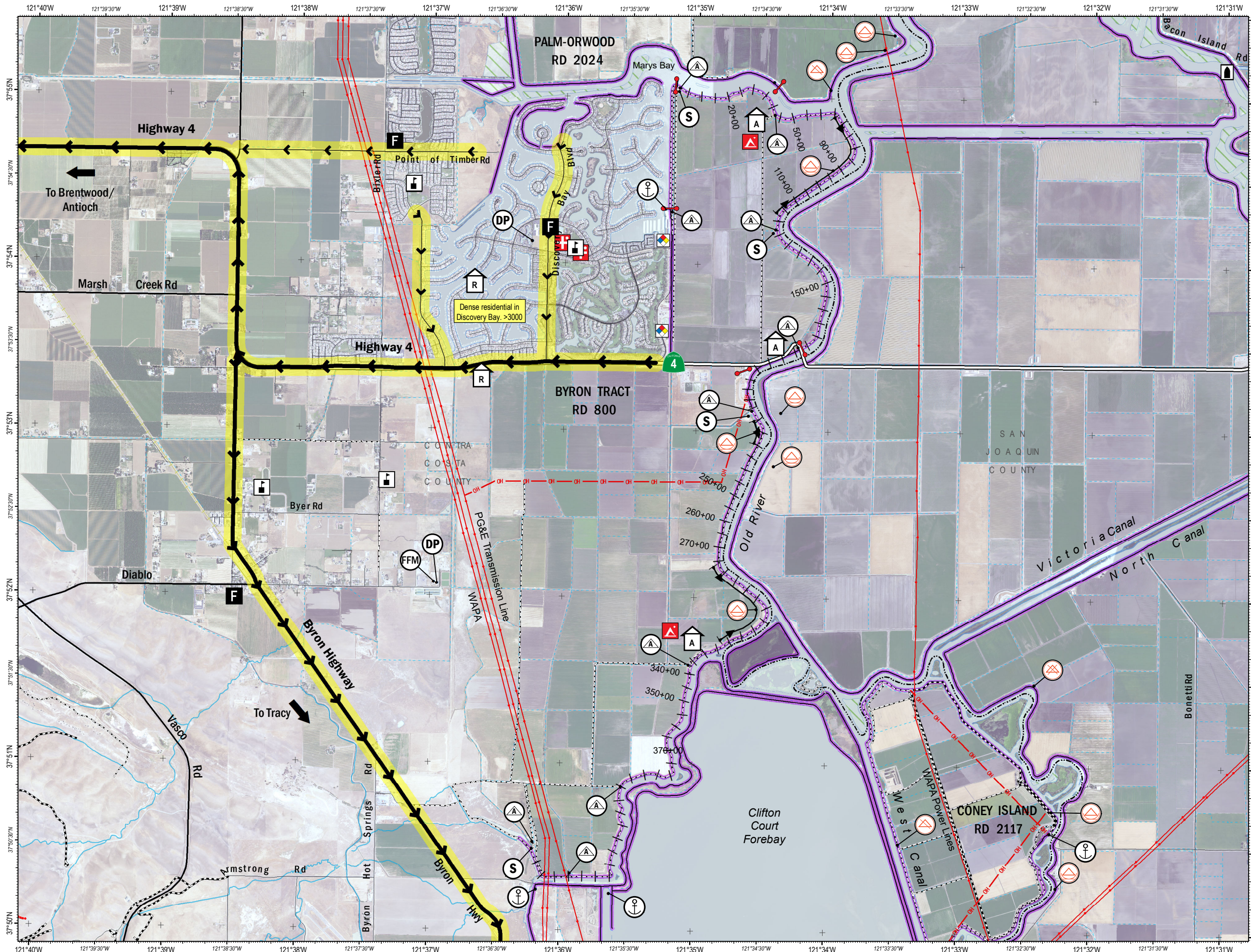
| | | | |
|--|---|---|--|
| <div>AMERICAN RED CROSS</div> <div>Sheltering 800.733.2767</div> | <div>DWR STATE-FEDERAL FLOOD OPERATIONS CENTER</div> <div>Coordination for Support 800.952.5530</div> | <div>CALTRANS</div> <div>Evacuation/Bridge Support 916.654.2852</div> | <div>CALIFORNIA CONSERVATION CORPS</div> <div>Environmental/Disaster Response 916.341.3100</div> |
|--|---|---|--|

LMA CONTACTS

| | | |
|--|--|---|
| <div>BIXLER TRACT (RD 2121)</div> <div>Tom Bloomfield 925.550.5540</div> | <div>DUTCH SLOUGH (RD 2137)</div> <div>Nate Hershey 916.456.4400</div> | <div>PALM-ORWOOD TRACT (RD 2024)</div> <div>Dante Nomellini 209.465.5883, Bus. 809.969.7755, Bus Cell</div> |
| <div>BIMID</div> <div>Regina Espinosa 925.684.2210 Lawrence Martins 925.383.8310</div> | <div>HOLLAND TRACT (RD 2025)</div> <div>David A. Forkel 925.932.0251 Bus. 925.693.9977 Bus. Cell</div> | <div>QUIMBY ISLAND (RD 2090)</div> <div>Al Warren Hoslett 209.943.5551, Bus.</div> |
| <div>BRADFORD ISLAND (RD 2059)</div> <div>Dominick Gulli 209.478.6525 Bus. 209.649.4555, Bus. Cell</div> | <div>HOTCHKISS TRACT (RD 799)</div> <div>Dina Holder 925.684.2398</div> | <div>VEALE TRACT (RD 2065)</div> <div>Dante Nomellini 209.465.5883, Bus. 809.969.7755, Bus Cell</div> |
| <div>BYRON TRACT (RD 800)</div> <div>Jeff Conway 925.584.8542 Bus.</div> | <div>JERSEY ISLAND (RD 830)</div> <div>Chad Davidson 925.625.2279 ER Contact 925.727.2938</div> | <div>WEBB TRACT (RD 2026)</div> <div>Al Warren Hoslett 209.943.5551, Bus.</div> |

| |
|---|
| <div>CONEY ISLAND (RD 2117)</div> <div>Dante Nomellini 209.465.5883, Bus. 809.969.7755, Bus. Cell</div> |
|---|

| |
|--|
| <div>WINTER ISLAND (RD 2122)</div> <div>Robert Calone 925.432.3300</div> |
|--|



Byron Tract

RD 800

The symbology presented in the legend below is global to the project area. Some symbols may not be present on map.

TRANSPORTATION

- Gate

ROADS

- Interstate
- Highway
- Major Road
- Local Road
- Trail, Major
- Trail

EVACUATION

- Rally Point

EVACUATION ROUTES

- Major Road
- Local Road

LEVEE INFORMATION

- 1000-Foot Levee Stationing
- Levee Centerline
- Tide Gate
- Levee Access Point
- Historic Levee Breach
- Levee Erosion
- Levee Seepage
- Agricultural Return Drain/Siphon
- Levee Crossing

RESPONSE INFORMATION

- Structure (T type) [A - Agricultural; R - Residential; S - Seasonal; U - Unknown] # (count) - [Approx. Structure Count]
- Boat Landing
- Supply Delivery Point
- Field Stockpile
- Flood Fight Material
- Supply Staging

REFERENCE INFORMATION

- Fire Station
- Home Care
- Ferry
- Hazardous Material
- School
- Ag. Worker Camp
- Dam
- Underground Power Line
- Transmission Line
- Underground Gas Line
- County Boundary



Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:40,400

FLOOD CONTINGENCY PLANNING INFORMATION

A.1. SPECIAL FLOOD CONSIDERATIONS

Y1 - UTILITY INFRASTRUCTURE

Major utility crossings exist in this area. Utility crossings including three sets of high power electrical lines (PG&E and WAPA), and one 42-INCH high-pressure gas main, and the Los Vaqueros Project Old River Pipeline. Coordination with county OES office and utilities are needed.

Y2 - DISEASE CONTROL

There are Approximately 100 head of cattle on the south end of the Reclamation District. Prior to actual flooding and at Stage El. 9 of the Venice Island gauge, the evacuation of the cattle should begin. During a flood, many head of cattle could become trapped and/or perish. Animal carcass management is a concern for disease control. Coordination with the County Agricultural Commissioner and the county OES is needed.

Y3 - LEVEE IMPROVEMENTS

Seepage in levee segments along Old River have been identified during high water events. Seepage alternative investigations are underway with planned improvements following.

Y4 - DISTRICT PUMP VULNERABILITIES

RD 800 pumping stations are below 100-year flood elevation. If a levee breach is imminent, efforts to protect the pump stations should be initiated.

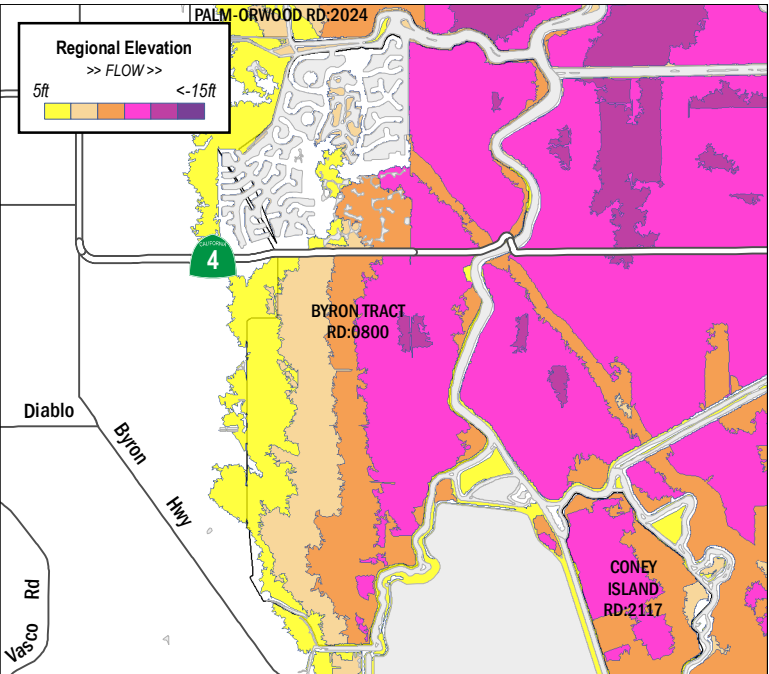
Y5 - CONTRA COSTA WATER DISTRICT

The CCWD Primary levee is set back to provide proper protection for their pumping facility operations as flooding of RD 800 could cause limited to major damage to infrastructure.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

Y1 - LOCAL HIGH WATER EVENT

Multiple high-water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. East side of Byron Tract Levee System may be lower than regional high-water event. Vulnerable area approx. 5,000 FT. Muscle wall or temporary earthen levee is recommended.

ACTIONS

1. Close control gate at intake slough. 2. Activate workforce for levee patrols. 3. Move or evacuate cattle population. 4. Prepare resources for temporary earthen levee or muscle wall. Muscle Wall Material Required: 5000 feet of temporary levee will require approximately 834 segments of muscle wall, 8340 sandbags, and 4170 cubic feet of sand. OR Temporary Earthen Levee Material Required: 5000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 100 rolls of 10 mil plastic sheeting, 1500 sandbags, and 225 cubic yards of fill. Approximately 27.8 cubic yards of fill for sand bags and 197.2 cubic yards of fill for visqueen fill.

NOTE: This is a hypothetical flood contingency option based on DWR’s flood fight methods to calculate material needs based on a given length of levee vulnerability.

C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

FLOOD FIGHT LABOR

| | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |
|--|-------------------------------------|-------------------------------------|

REPAIR CONTRACTORS

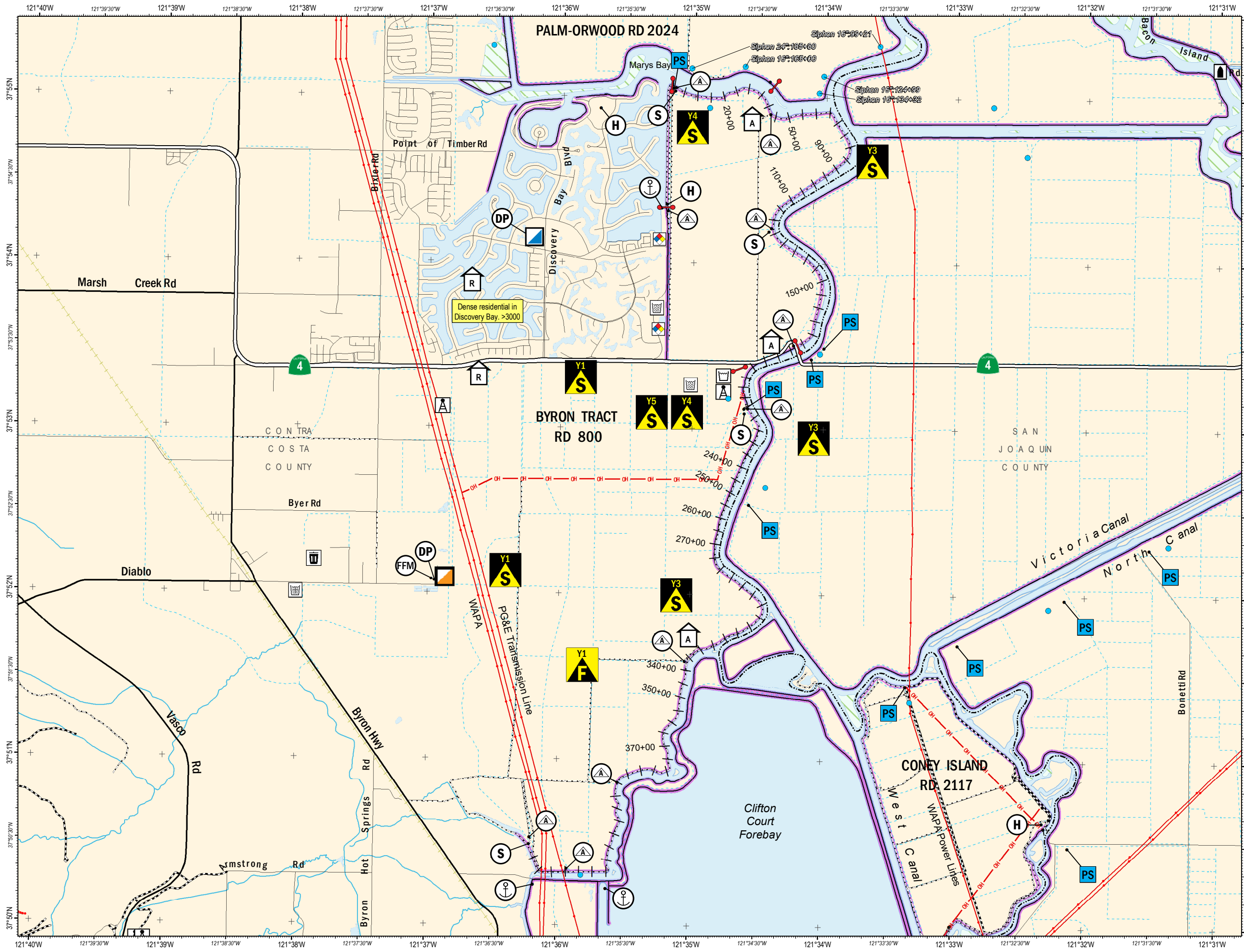
| | | | |
|--|---|--|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |
|--|---|--|---|

MATERIALS SUPPLIERS

| | | |
|--|---|--|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 | |

LOCAL SUPPLY PROVIDERS

| | | |
|--|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 | |



Byron Tract

RD 800

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

- Gate
- ROADS
 - Interstate
 - Highway
 - Major Road
 - Local Road
 - Trail, Major
 - Trail

FLOOD CONTINGENCY OPTIONS

- D3 F** Flood Contingency Option
- D2 S** Special Flood Consideration

LEVEE INFORMATION

- 1000-Foot Levee Stationing
- Levee Centerline
- Tide Gate
- Levee Access Point
- Agricultural Return Drain/Siphon
- Levee Crossing

RESPONSE INFORMATION

- T_r** Structure
 - T (type) [A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
 - # (count) - [Approx. Structure Count]
- Boat Landing
- Supply Delivery Point
- Field Stockpile
- Flood Fight Material
- Helispot
- Supply Staging
- Command Post
- Command Post Secondary
- Pump Station
- Pump Station Agricultural

REFERENCE INFORMATION

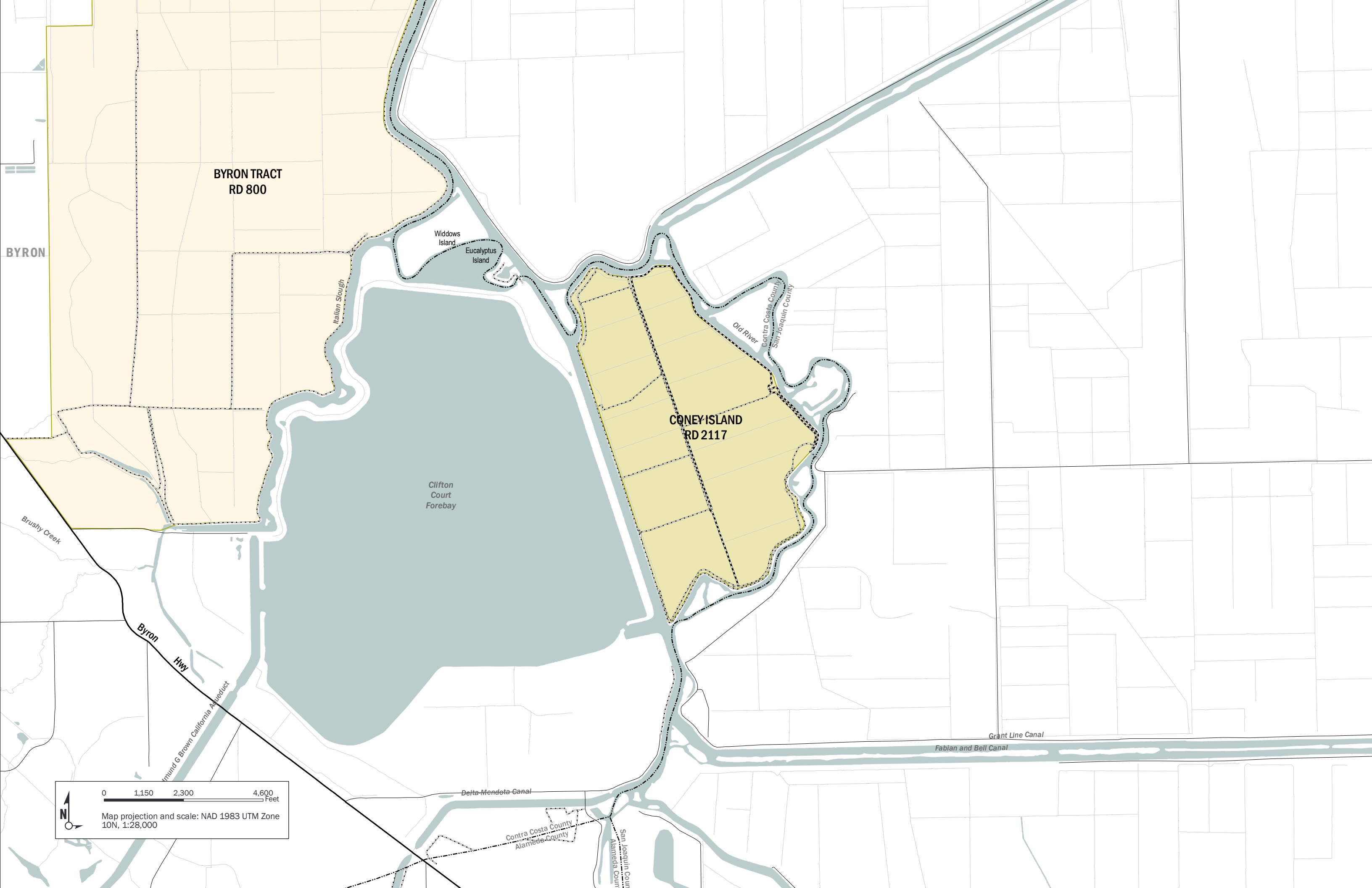
- Ferry
- Potable Water Facility
- Solid Waste Facility
- Hazardous Material
- Communication Facility
- Waster Water Facility
- Natural Gas Facility
- UG — UG — Underground Power Line
- Transmission Line
- UG — UG — Underground Gas Line
- County Boundary



Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:40,400

Coney Island RD 2117





BYRON TRACT
RD 800

Widdows
Island
Eucalyptus
Island

Italian Slough

Clifton
Court
Forebay

CONEY ISLAND
RD 2117

Old River
Contra Costa County
San Joaquin County

Brushy Creek

Byron
Hwy

Mund G Brown California Aqueduct

Delta Mendota Canal

Grant Line Canal

Fabian and Bell Canal

Contra Costa County
Alameda County

San Joaquin County
Alameda County

N

0

1,150

2,300

4,600

Feet

Map projection and scale: NAD 1983 UTM Zone 10N, 1:28,000

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

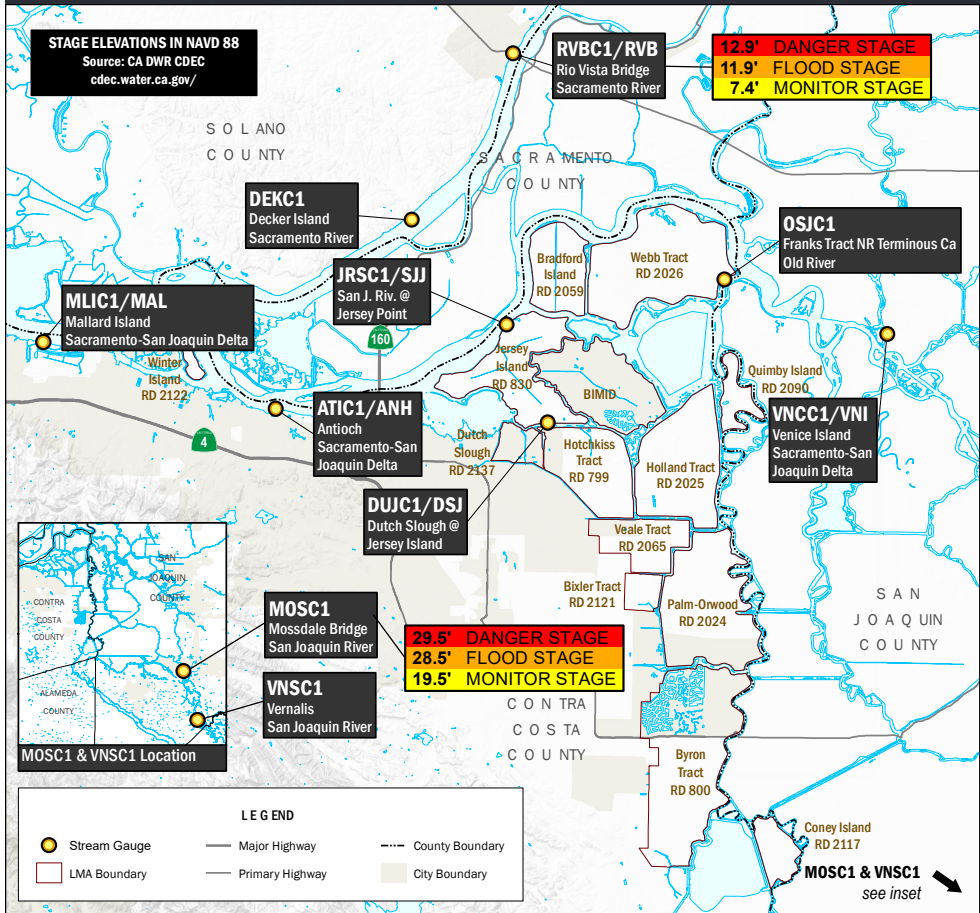
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|-------------------------------------|--|---|
| SACC1/IST I Street Bridge | RVBC1/RVB Rio Vista Bridge | DEKC1 Decker Island |
| MLIC1/MAL Mallard Island | JRSC1/SJJ SJ Riv. @ Jersey Pt | OSJC1 Franks Tract, Terminous |
| ATIC1/ANH Antioch | DUJC1/DSJ Dutch Slough @ Jersey Island | MOSC1/MSD Mossdale Bridge |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

LARGE EQUIPMENT STAGING LOCATION

Open space at residence on southeast Coney Island along Old River.
37°50'38.01391800"N, 121°32'18.45090240"W

LARGE EQUIPMENT STAGING LOCATION

Yard on east side of island on Old River.
37°50'54.65773680"N, 121°32'30.04343160"W

WEST STAGING

Open yard/field on west side of island along West Canal.
37°50'53.38120200"N, 121°33'29.28530880"W

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

SOUTH EAST RESIDENCE

Delivery point at residence on southeast levee. Delivery via levee road bridge or boat dock.
37°50'36.56591160"N, 121°32'17.61732600"W

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

EARTHEN MATERIAL

Stockpile on southwest end of island at canal and Old River.
37°49'50.88644760"N, 121°33'08.59165200"W

EARTHEN MATERIAL

Stockpile on north end of island on Old River.
37°51'30.16478880"N, 121°33'08.38685520"W

EARTHEN MATERIAL

Stockpile on southeast end of island on Old River.
37°50'23.58802320"N, 121°32'22.94079720"W

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

EAST OLD RIVER

DWR recommended flood fight materials at yard on east side of island on Old River.
37°50'55.82278680"N, 121°32'30.95172960"W

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

No Known HazMat Locations in Map Extent

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY OFFICE OF EMERGENCY SERVICES

CCC OES
925-228-5000, 24-HOUR

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.427.8562

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
916.574.2619

CALTRANS

Evacuation/Bridge Support
916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell

JERSEY ISLAND (RD 830)

Chad Davidson
925.625.2279
ER Contact
925.727.2938

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

DUTCH SLOUGH (RD 2137)

Nate Hershey
916.456.4400

PALM-ORWOOD TRACT (RD 2024)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

HOLLAND TRACT (RD 2025)

David A. Forkel
925.932.0251
925.693.9977

WEBB TRACT (RD 2026)

Al Warren Hoslett
209.943.5551, Bus.

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300



Coney Island

RD 2117

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

- Gate

ROADS

- Interstate
- Highway
- Major Road
- Local Road
- Trail, Major
- Trail

LEVEE INFORMATION

- 1000-Foot Levee Stationing
- Levee Centerline
- Tide Gate
 - Levee Access Point
 - Historic Levee Breach
 - Levee Erosion
 - Levee Seepage
 - Agricultural Return Drain/Siphon
 - Levee Crossing

RESPONSE INFORMATION

- Structure T (type)
[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]
- Boat Landing
 - Supply Delivery Point
 - Field Stockpile
 - Flood Fight Material
 - Supply Staging

REFERENCE INFORMATION

- Fire Station
- Home Care
- Ferry
- Hazardous Material
- School
- Ag. Worker Camp
- Dam
- Underground Power Line
- Transmission Line
- Underground Gas Line
- County Boundary



Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:14,200

FLOOD CONTINGENCY PLANNING INFORMATION

A.1. SPECIAL FLOOD CONSIDERATIONS

C1 - CONEY ISLAND
Coney Islands surrounded to the west by the Clifton Court Forebay West Canal and to the east by Old River. The Clifton Court Forebay West Canal conveys water supply to the Clifton Court Forebay tide gates. Coney Island’s western perimeter levee is the eastern bank for the West Canal. The Western Canal levees on the Coney Island embankments have been reported to have scour in a few locations from station 130+00 to 200+00.

C2 - CLIFTON COURT FOREBAY DAILY OPERATIONS
During actual daily project operations, data are transmitted hourly to DWR and Reclamation hydrometeorological systems in their water management control centers in Sacramento. These data consist of river flows, tides, salinity, and wind speed/direction at various Delta locations. If the data indicate a significant deviation from the planned conditions, one or more of the three following operational changes can be implemented: (1) adjust project reservoir releases, (2) adjust Delta export levels, and (3) close or open the Delta Cross Channel gates. Reservoir releases are most effective for meeting Sacramento River salinity criteria or Delta outflow criteria. San Joaquin River salinity criteria (most frequently at Jersey Point) are most effectively met by adjusting the amount of export pumping.

C3 - OLD RIVER SCOUR
Clifton Court Forebay is located directly west across Western Canal from Coney Island and pumps a large amount of water to Southern California. The pumping of enormous volumes of water has caused severe scouring of the river bottom, which possibly will cause an increase in seepage volumes and locations as well as an increase in waterside levee erosion over time. Current depths along the Western Canal from Levee STA. 130+00 to 200+00 is roughly 30-40 FT.

C4 - DISTRICT PUMP VULNERABILITIES
Coney Island pumping stations are below 100-year flood elevation. If a levee breach is imminent, efforts to protect the pump stations should be evaluated.

C5 - ACCESS TO CONEY ISLAND
Only ground access to Coney Island is through RD #2. In the event of flooding of RD 0002, an emergency access plan would be needed to provide Coney Island with flood fight supplies and other emergency needs.

C6 - UTILITY INFRASTRUCTURE WARNING
High voltage electrical transmission lines cross the Island NW through the middle of the Island.

C7 - STATE WATER PROJECT REVERSE FLOW
State Water Projects (SWP) reverse flow in Old River and West Canal have been known to scour RD 2117 levees. Reverse flows are also creating sediment accretion on outside bends in Old River that reduce channel capacity and marine navigational capability.

C8 - HMP LEVEE CRITERIA
RD 2117 meets its certification status based on Hazard Mitigation Plan (HMP) criteria for levee geometry.

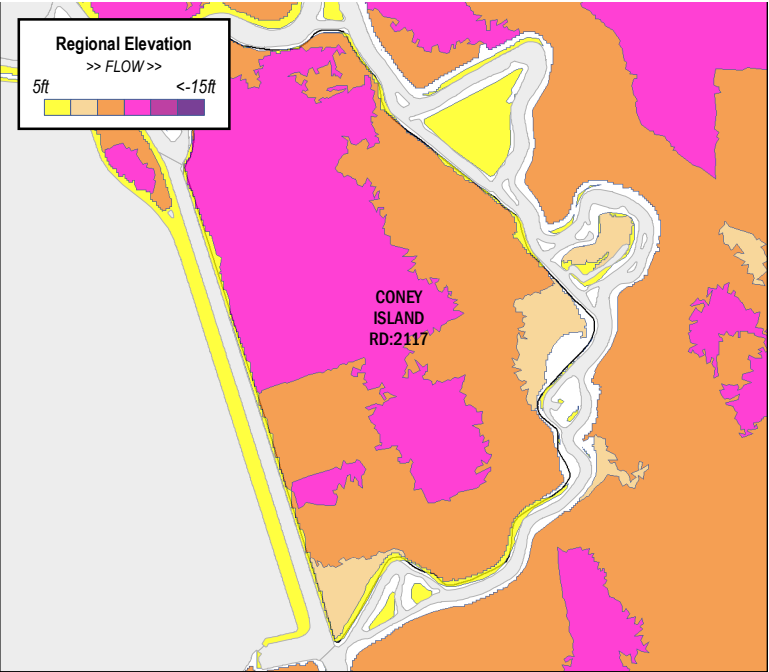
C9 - ISLAND AGRICULTURE AND INFRASTRUCTURE
The District consists of 933 acres of high value agricultural use. Other infrastructure includes Western Area Power Administration (WAPA) power lines.

C10 - STRUCTURES AND POPULATION
RD 2117 protects a single residence and labor housing.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

C1 - HIGH WATER EVENT
Multiple high water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Vulnerable area approx. 2,000 FT. Muscle wall or temporary earthen levee is recommended.
ACTIONS
1. Activate workforce for levee patrols - regular scheduled levee patrols depending on the severity of the event. 2. Deploy flood fight materials to prevent levee degradation. Prepare resources for temporary earthen levee or muscle wall (utilize borrow material on site, if necessary). Muscle Wall Material Required: 2000 feet of temporary levee will require approximately 334 segments of muscle wall, 3340 sandbags, and 1670 cubic feet of sand. OR Temporary Earthen Levee Material Required: 2000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 40 rolls of 10 mil plastic sheeting, 600 sandbags, and 90 cubic yards of fill. Approximately 11.1 cubic yards of fill for sand bags and 78.9 cubic yards of fill for Visqueen fill.

NOTE: This is a hypothetical flood contingency option based on DWR's flood fight methods to calculate material needs based on a given length of levee vulnerability.

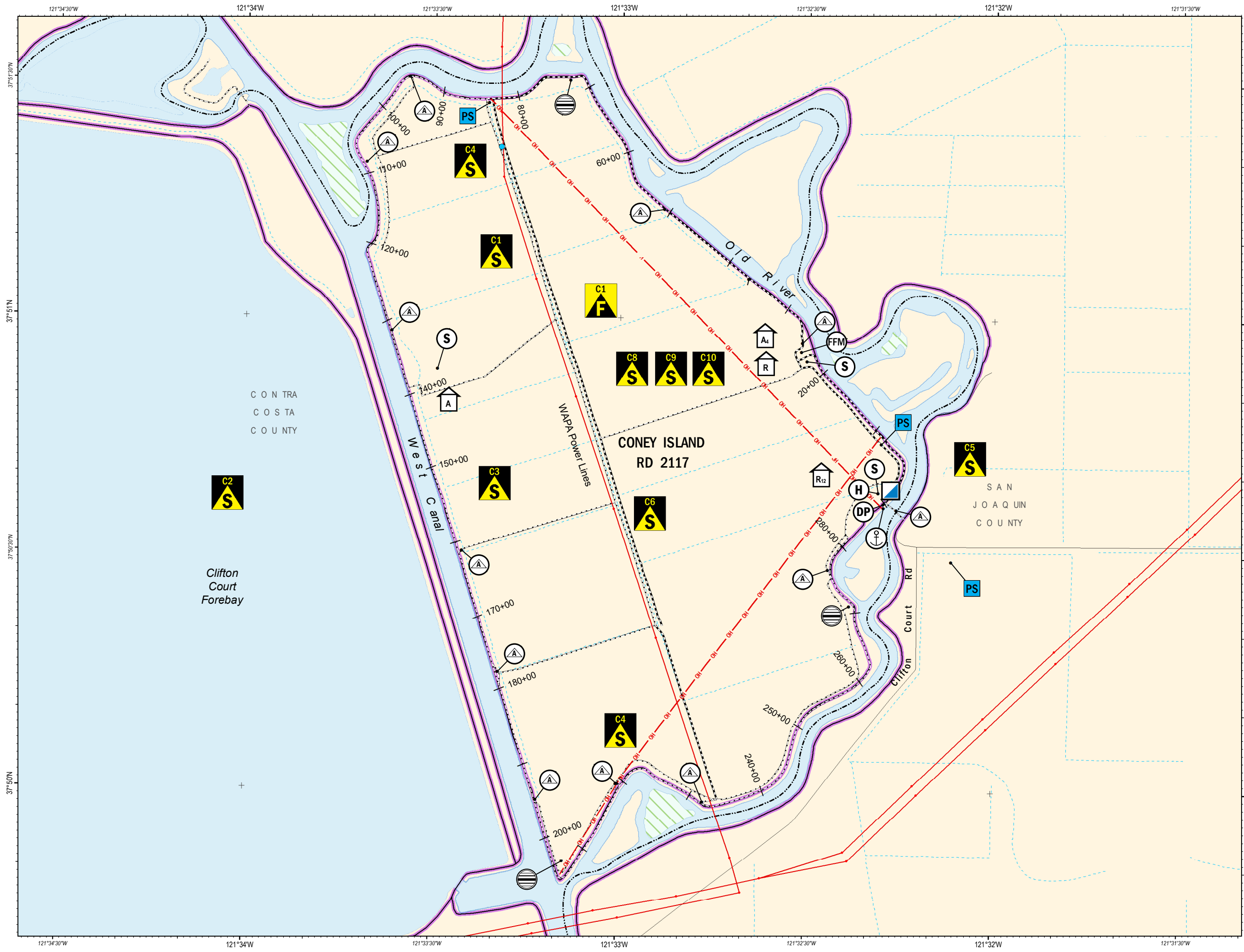
C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

| FLOOD FIGHT LABOR | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |

| REPAIR CONTRACTORS | | | |
|--|--|---|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |

| MATERIALS SUPPLIERS | | |
|--|---|--|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 | |

| LOCAL SUPPLY PROVIDERS | | |
|--|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 | |



Coney Island

RD 2117

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

- Gate
- ROADS
 - Interstate
 - Highway
 - Major Road
 - Local Road
 - Trail, Major
 - Trail

FLOOD CONTINGENCY OPTIONS

- D3 F** Flood Contingency Option
- D2 S** Special Flood Consideration

LEVEE INFORMATION

- 1000-Foot Levee Stationing
- Levee Centerline
- Tide Gate
- Agricultural Return Drain/Siphon
- Levee Access Point
- Levee Crossing

RESPONSE INFORMATION

- T₊** Structure
 - [A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
 - # (count) - [Approx. Structure Count]
- Boat Landing
- Supply Delivery Point
- Field Stockpile
- Flood Fight Material
- Helispot
- Supply Staging
- Command Post
- Command Post Secondary
- Pump Station
- Pump Station Agricultural

REFERENCE INFORMATION

- Ferry
- Potable Water Facility
- Solid Waste Facility
- Hazardous Material
- Communication Facility
- Waster Water Facility
- Natural Gas Facility
- Underground Power Line
- Transmission Line
- Underground Gas Line
- County Boundary



Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:14,200

Flood Fight Information

Source
Emergency Flood Fighting Methods; Rick Burnett and Elizabeth Bryson; State of California, California Natural Resources Agency, Department of Water Resources; Division of Flood Management, Flood Operations Branch, August 2010.

Levee and Embankment Threats

The main causes of levee failure or flood related problems due to high water are:

- Seepage through or under the levee heavy enough to cause a “boil”.
- Erosion of the levee or embankment due to swift moving water or wave action.
- Overtopping resulting from water-surface elevations higher than the levee or embankment.

Patrolling

The best defense against flood related issues and/or levee failure is to identify problems early and repair them immediately. Biannual levee inspections and effective high water patrolling make this possible. The following suggestions will help in organizing patrol teams for this work.

- Operate under the SEMS / ICS system and report to the appropriate section chief.
- Provide a sufficient number of workers for two 12 hour shifts.
- Provide each worker with a copy of this ‘Flood Fighting Methods’ handbook.
- Assign two people to each mobile patrol.
- Assign each mobile patrol vehicle an area no larger than can be inspected at least every 2 hours, with more frequent patrols as conditions warrant. Foot patrols may offer a more thorough inspection.
- Furnish each mobile patrol vehicle with radio/cell phone or other communication equipment, lights for night patrol, and the following materials: Laths, survey ribbon, permanent marker, pad and pencil, flashlight with extra batteries, 2 shovels, 1 sledge hammer, approximately 50 sandbags (empty), 1 roll of plastic sheeting (visqueen), 1 box twine, 100 buttons, 25 wooden stakes, lifeline, personal floatation devices, blanket, First Aid kit, Directory of Flood Officials, and Flood Emergency Phone Card.
- Identify potential problems: boils, seepage, erosion, cracks, sloughing etc.
- Instruct each patrol team on the correct filling and placement of sandbags. They should know what danger signs to watch for, and how to signal for help.
- Vehicles should remain on high ground in threatened areas. Always have escape routes and make them known.
- Instruct each leader to check with their team members frequently. Investigate all reported problems.
- Be aware of the locations of stockpiled sandbags and other tools and equipment at strategic locations.
- Be prepared to obtain more workers, tools, and equipment on short notice.
- Advise the officials of the district or agency responsible for emergency assistance in the area and if necessary, request their help, i.e. local emergency services office.
- Contact the nearest representative of the Department of Water Resources for technical advice and assistance.

Filling Sandbags

When filling sandbags you should work in pairs, with one person holding the bag while the other shovels in the fill material. The bag holder should find the most comfortable position while holding the bag open. The most common mistake made is overfilling bags. The first shovel of fill should be placed on the lip of the bag to help hold the bag open. The shoveler should use rounded scoops of fill until the bag is approximately 1/3 full. While shoveling or holding, avoid extra movements (turning or twisting of the back) to prevent injury and reduce fatigue.

Passing Sandbags

To avoid injuries and maximize productivity emergency responders can be organized into a sandbag passing line or ‘chain’.

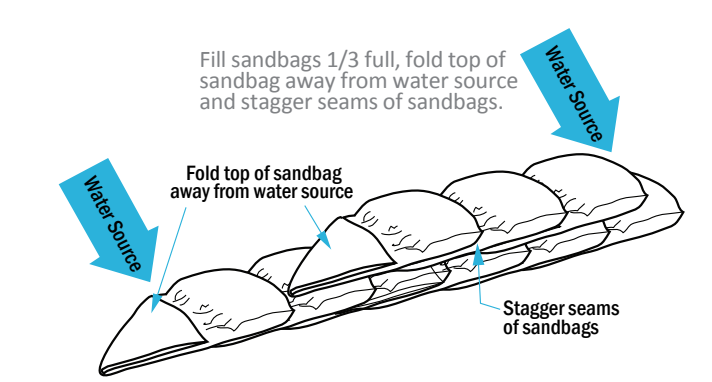
The line is formed by standing facing the next person and slightly off set. The bags are passed down the center of the chain.

Sandbag Construction

The use of sandbags is a simple but effective method of preventing or reducing damage from floodwater and debris. Suggestions for constructing sandbag structures are:

1. Close-weave burlap bags 18” x 30” are recommended for all sandbag construction when available.
2. Fold the empty top of the bag at a 45-degree angle to keep sand from leaching out.
3. Place each bag over the folded top of the preceding bag and stomp into place.
4. Stagger the second layer of bags over the seams of the preceding layer.
5. Stomp all bags to form a tight seal.
6. The last sandbag in a line is referred to as a Key Sack. The empty top of this bag is folded under and stomped into place.

SANDBAG CONSTRUCTION



Control of Overtopping

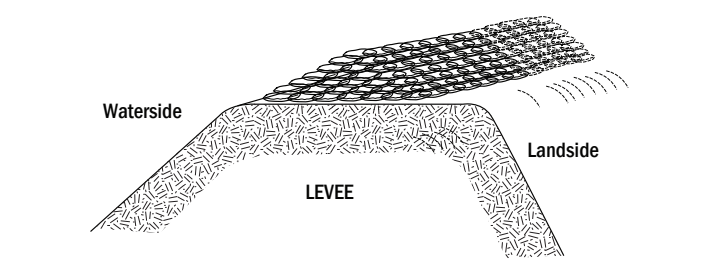
If any levee reach or stream bank is lower than the anticipated high water elevation, an emergency topping should be constructed to raise the grade above the forecast flood height. A sack topping may be required at road or stock crossings, low levee sections, or railroad crossings. The following sections discuss various methods for increasing levee and bank elevations.

Sack Topping

The most common form of flood control work is the use of sandbags for construction of temporary walls. The use of sandbag walls to increase the height of a levee section is called “sack topping”. The sacks are laid “as stretcher rows,” or along the levee.

Alternate layers can be crossed if additional strength is needed. The sacks should overlap at least one-third and stomped firmly into place. When properly placed and compacted, one sack layer will provide about 3 to 4 inches of topping.

SACK TOPPING



Temporary Levee

This method is used to raise low areas during high water periods to prevent overtopping of levees, stream and riverbanks, small earthen dams, roadways, etc. To raise low areas, unfold a 20’x100’x10 mil roll of plastic sheeting and lay out flat on area to be raised. Place fill material on plastic. Fold plastic over material, lay a single row of sandbags on the backside lip of plastic and on all seams. Fill material can be placed using bottom dump or dump bed trucks, front-end loader or manually.

Lumber and Sack Topping

Wooden panels are used on the waterside shoulder and reinforced on the opposite side with sandbags. The method is used to raise low reaches during high water and divert debris flow. Stakes 2”x 4”x 6’ should be driven on the waterside shoulder 6 feet apart. A shallow trench is and lined with empty sandbags to provide a seal. Pre-constructed wooden panels are placed in the trench and nailed to the landside of the stakes. This wall should then be backed with enough sandbags to support the panels against the expected high water. In some cases, it may be practical to back the panels with compacted earth in lieu of sandbags. Attach 2”x 4”x 10’ lumber kickers to the stakes that support the panels, and drive 2’ stakes into the levee crown. Use at least two nails at each joint to provide rigid construction.

Control of Boils (Away from Levee)

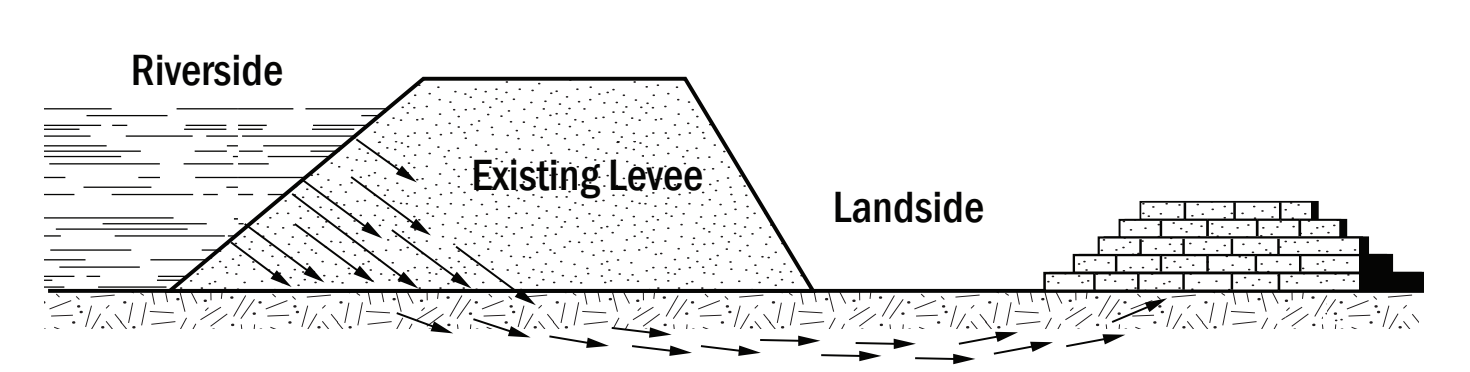
A boil is a condition that occurs when water is “piped” through or under a levee and resurfaces on the landside. These weak points are generally caused by burrowing rodents or decomposed tree roots. High water pressure can begin to erode the interior of the levee and weaken the structure. Levee material will deposit around the exit point as the water discharges on the landside. If the boil is determined to be “carrying material” then corrective action is required to control the situation.

If left unattended the material that makes up the levee can be eroded at an accelerated pace, causing subsidence and overtopping of the levee. This could result in a levee break.

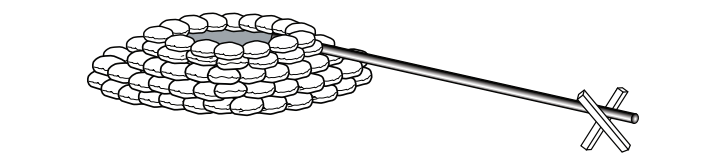
The common method for controlling a boil is to create a watertight sack ring around it. The sandbag structure should be high enough to slow the velocity of the water and prevent further discharge of material from the boil. The flow of water should never be stopped completely, since this may cause the boil to “break out” in an area near the existing sack ring. A spillway must be constructed to direct water away from all boil sites.

The sack ring should be large enough to encompass the area immediately surrounding the discharge point (3 to 4 feet diameter). If several boils carrying material are found, a single large sack ring may be constructed around the entire “nest” of boils.

FLOW OF WATER THROUGH LEVEE



BOIL SACK RING



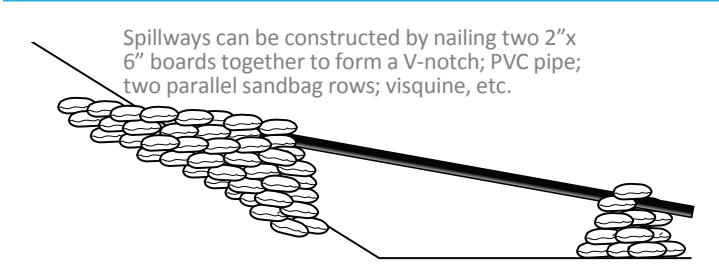
Control of Boils (On Levee Slope)

If the boil is close to or on the levee slope, a U-shaped sack ring may be built around the boil and keyed into the slope. Construction of this method can be difficult and requires substantial shoring up of the U-shaped sack ring structure. A spillway must be constructed to direct water away from all boil sites.

Waterside Boil Inlet Detection

Water running through a levee and carrying material can sometimes be stopped on the waterside, thus eliminating the building of sack rings on the landside. A six foot long section of 2” diameter metal pipe secured to a 5’x 6’ foot piece of plastic or canvas can be rolled over the inlet hole on the waterside. Drive 1”x 3”x 2’ stakes into the shoulder of the levee. Suspend half-filled sandbags on top of rolled-out material with twine and tie off to stakes. It can be difficult to locate the waterside inlet of boils. Sometimes a swirl is observed at the water’s edge.

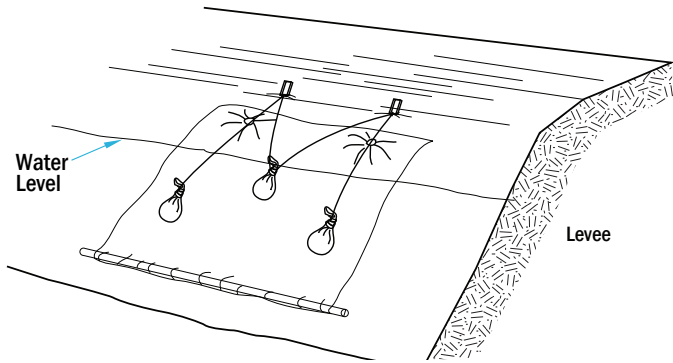
SPILLWAY



Wavewash Protection

All levees adjacent to wide stretches of water should be watched during periods of strong wind to detect the early stages of wavewash erosion. If the slope is well sodded, short periods of high wind should cause little damage. However during sustained periods of strong wind and high water, experienced personnel should observe and monitor the effected areas.

WATERSIDE BOIL PROTECTION



Envelope Method

When used correctly, plastic sheeting is useful for wavewash protection. Visqueen should be purchased in 10 mil rolls, 20 feet wide by 100 feet long. 1"x3"x2' wooden stakes are driven into the ground just above the levee shoulder on the side you wish to protect. Place the stakes 4 feet apart and stagger vertically by 1 foot.

Avoid driving stakes in a straight line; this can cause cracking and sloughing of the slope. To provide added strength and leverage, drive stakes at a slight angle away from the water source with the wide (3") side facing the water. Be sure the stakes are well into the ground and are secure.

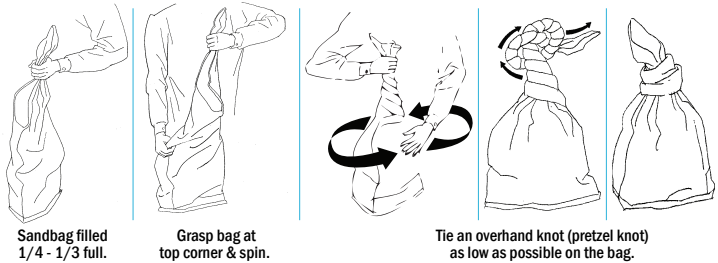
When rolling out the plastic sheeting it is helpful to use a shovel or similar long-handled tool. Eight to ten people should assist in shaking out the folds of the envelope. Be sure that both layers are held while the envelope is shaken out. Hold on tight! Use caution in strong winds. If the wind catches the plastic it could billow out and pull you along with it.

While flood workers hold the plastic securely, toss tied sandbags into the envelope. The tied sandbags are thrown into the bottom of the envelope with a one-foot gap between bags. The tied bags provide weight to hold the plastic against the levee slope.

A tie-down button or small stone (preferably round) is secured through both layers of visqueen. If a stone is used, tie a slip knot and double half-hitch to secure it. Fasten buttons to the visqueen and tie off to the stakes using a minimum 250 lb. tensile strength twine with these points in mind: Plastic sheeting is secured using tie down buttons. To attach plastic buttons to the plastic, tie a slipknot on the end of the twine; slip loop over button and plastic and draw tight. Tie two half-hitch knots around the throat of main body.

Extend twine to large end of main body, tie a half-hitch knot around the end, and secure twine to stake. With the plastic secured to the stakes, punch a small hole between each tied bag in the envelope, (a pencil works well). These holes release water trapped in the envelope. DO NOT use a knife because a slice or slit will tear and spread in the plastic. If further slope protection is necessary insert an additional envelope into the existing wavewash protection overlapping at least four feet. To secure the overlap to the stakes attach the two top layers with one button and the two bottom layers with another. The buttons line up with the stakes that are four feet apart. There should be four buttons securing the two envelopes. Using a continuous piece of twine, hang tied bags from stakes in a zigzag fashion. Tie a double half-hitch knot below the knot in each sandbag. Place each bag so that it hangs at the middle of the plastic directly below the stake between the two stakes from which it is suspended. Attach twine to every other stake with a double half-hitch. Add a second row of tied bags suspended from the stakes previously skipped. These bags will keep the plastic lying flat against the levee slope in windy conditions. If the upper portion of the slope needs protection, use an additional envelope. Be sure to place the upper layer over the lower layer by 2 to 3 feet. Finally place sandbags along all seams to prevent wind and water from entering the envelope. To prevent slippage, make sure the sandbags forming the top seam cap are half on the plastic and half on the levee. If the levee slope is too steep, some of the bags on the seam may be tied off with twine to the stake above the envelope for support. Remember, wind is your worst enemy. When using plastic sheeting, be sure all seams are secured with sandbags, and make needed repairs to the envelope as soon as possible.

TYING SANDBAGS



Tying Sandbags

Most sandbags are used with the open end folded. In some cases sandbags will have to be tied. Fill the bag 1/4 to 1/3 full of material.

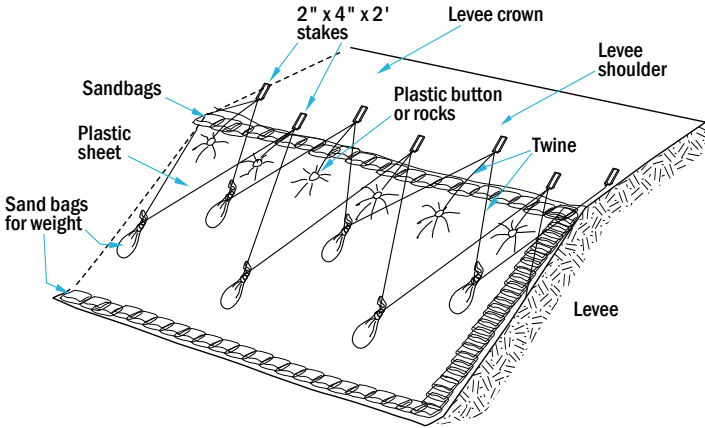
Raincoat Method

The raincoat method is used to prevent further saturation of levee or hillside slopes. Plastic sheeting is laid out flat on the slope, sandbags are placed around the perimeter with additional bags placed randomly for weight. If the slope is steep, wooden stakes can be driven into the ground just above the area to be protected. The stakes are 4 feet apart with a 1-foot stagger. The plastic is secured to the stakes with tie-down buttons or small round rocks. Use a crisscross method of placing the sandbags on the plastic. Place a solid row of sandbags on all edges of the plastic (half on the ground, half on the plastic).

Emergency Spillway

To prevent damage to the levee slope due to overtopping, an emergency spillway can be constructed. Place plastic sheeting over area to be used for spillway. Line all sides with at least a single row of sandbags. Use additional tied sandbags on plastic for weight if needed.

RAINCOAT METHOD



Structure Protection/Diversions

The main causes of damage to structures, homes, and property during heavy rains or flood flows are:

1. Flood water from overwhelmed storm drains and urban diversions, particularly on sloping streets.
2. Flood flows onto property through driveway openings and low spots in curbs.
3. Debris flow from hillsides that have been cleared of vegetation by fire or real estate development.

The flood fighting methods described in the following sections have proved effective in combating floodwaters and debris flows.

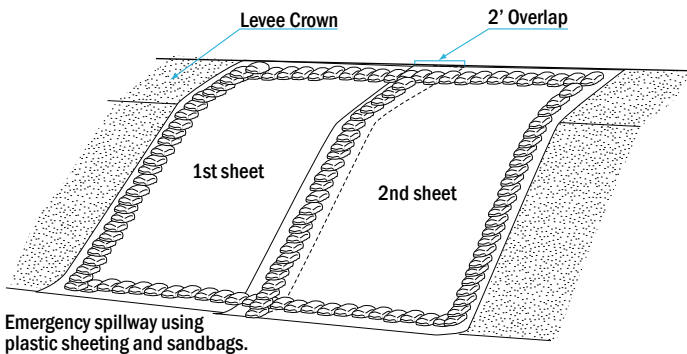
Diverting Water or Debris Flows Away from Structures

Homes and structures can be protected from floodwater or debris flows by redirecting the flow. Sandbag barriers must be long enough to divert the flows away from all structures. Barriers constructed of sandbags or lumber can also be used to channel mud and debris away from property improvements.

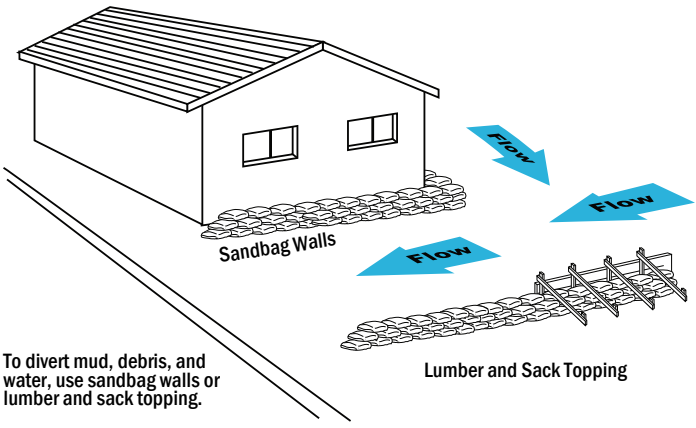
Structure Protection

The following method is used for protection of buildings and other structures along lake shores and in similar situations where water is rising with little or no current. Lay plastic sheeting on the ground and up the building walls to a point at least 1 foot above the predicted water elevation, and far enough out on the ground to form a half pyramid of sandbags. Secure plywood over doors and vents. Overlap plastic sheeting and sandbags at corners of buildings.

EMERGENCY SPILLWAY



STRUCTURE PROTECTION



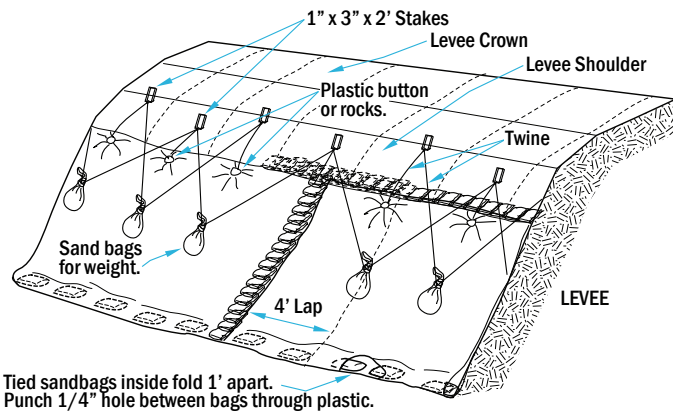
Wet Flood Proofing Requirements for Structures

Located Within Special Flood Hazard Areas National Flood Insurance Program regulations require that buildings on extended wall foundations or that have enclosures below the base flood elevation must have foundation or enclosure wall openings. These openings prevent the foundation or enclosure walls from weakening or collapsing under pressure from hydrostatic forces during a 100 year flood event. The openings allow flood waters to reach equal levels on both sides of the foundation or enclosure wall and minimize the potential for damage from hydrostatic pressure. THESE OPENINGS MUST NOT BE BLOCKED IF THE BUILDING IS LOCATED WITHIN A SPECIAL FLOOD HAZARD AREA.

Water / Storm Drain Protection

Water or sewer systems can be protected by placing corrugated metal pipe (CMP) over the utility hole. Lay plastic sheeting up the walls of the CMP and place sandbags in the form of a half pyramid around the CMP to seal it to the pavement. This method will prevent mud and debris from entering the system and also act as a surge chamber.

ENVELOPE METHOD



Flood Fight Information Materials Calculators

MATERIALS CALCULATORS

SACK TOPPING

The most common form of flood control work is using sandbags to construct temporary walls. The use of sandbag walls to increase the height of a levee section is called "sack topping." The sacks are laid as "stretcher rows," or along the levee. The sacks should overlap by at least one-third of the bag and be stomped firmly into place. When properly placed and compacted, one sack layer will provide about 3 to 4 inches of topping.

NECESSARY MATERIAL FOR 100 FEET OF

LEVEE PROTECTION:

- Sandbags
- 600 – 1 foot high x 100 linear feet
- 2,100 – 2 feet high x 100 linear feet
- 4,500 – 3 feet high x 100 linear feet
- 7,800 – 4 feet high x 100 linear feet
- Sand or similar earthen material (0.5 cubic feet per sandbag)
- 300 cubic feet – 1 foot high x 100 linear feet
- 1,050 cubic feet – 2 feet high x 100 linear feet
- 2,250 cubic feet – 3 feet high x 100 linear feet
- 3,900 cubic feet – 4 feet high x 100 linear feet
- LABOR:**
- 3-person team fills 2 bags per minute average over an hour, or 120 bags per hour.
- 5 hours – 1 foot high x 100 linear feet
- 17.5 hours – 2 feet high x 100 linear feet
- 37.5 hours – 3 feet high x 100 linear feet
- 65 hours – 4 feet high x 100 linear feet

MUSCLE WALL TEMPORARY LEVEE (2-FOOT WALL)

Muscle Walls are water-filled, rigid, molded plastic containers that are interlocked on site by manually lifting a container's tongue end over the groove end of another container and sliding them together. Each container is 6 feet long, 2 feet high, and 2.5 feet wide and provides an impervious water barrier (apron and wall). The minimum footprint is 10 feet of width to accommodate a 4-foot apron, the barricade, and a 4-foot monitoring and seepage management area. This is designed for even and firm terrain with minor seepage on impervious surfaces.

NECESSARY MATERIAL FOR 100 FEET OF

LEVEE PROTECTION:

- 10 sandbags for every section of Muscle Wall
- Gloves
- 500-1,000 feet of string
- Trash pump
- Forklift
- Lifting dolly
- Gorilla tape
- Pressure washer
- Foam sealant (for - impervious surface)
- 2 razor knives
- Trencher
- Shovels
- 200-foot measuring tape
- Marking paint
- 2 sledgehammers

ENVELOPE WAVE WASH PROTECTION

When used correctly, plastic sheeting is useful for wave wash protection. Visqueen should be purchased in 10-mil rolls, 20 feet wide by 100 feet long. Drive 1-inch x 3-inch x 2-foot wooden stakes into the ground just above the levee shoulder on the side you wish to protect. Place the stakes 4 feet apart and stagger vertically by 1 foot. Avoid driving stakes in a straight line; this can cause cracking and sloughing of the slope. To provide added strength and leverage, drive stakes at a slight angle away from the water source with the wide (3-inch) side facing the water. Be sure the stakes are well into the ground and are secure. When rolling out the plastic sheeting, it is helpful to use a shovel or similar long-handled tool. Eight to ten people should assist in shaking out the folds of the envelope. Be sure that both layers are held while the envelope is shaken out. While flood workers hold the plastic securely, toss tied sandbags into the bottom of the envelope, with a 1-foot gap between bags. The tied bags provide weight to hold the plastic against the levee slope. A tie-down button or small stone (preferably round) is secured through both layers of Visqueen. If a stone is used, tie a slipknot and double half-hitch to secure it. Fasten buttons to the Visqueen and tie off to the stakes using a minimum 250-lb. tensile strength twine with these points in mind: the plastic sheeting is secured using tie down buttons. To attach plastic buttons to the plastic, tie a slipknot on the end of the twine; slip loop over button and plastic, and draw tight. Tie two half-hitch knots around the throat of the plastic sheeting.

NECESSARY MATERIAL FOR 100 FEET OF

LEVEE PROTECTION:

- 2 rolls (20 feet x 100 feet) of 10 mil plastic sheeting
- 30 sandbags
- 2 rolls twine
- 10 plastic buttons or rocks
- 20 1-inch x 3-inch x 2-foot stakes
- 15 cubic feet of sand or similar earthen material

TEMPORARY EARTHEN LEVEE

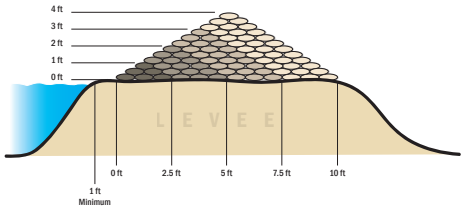
This method is used to raise low areas during high water periods to prevent overtopping of levees, stream and riverbanks, small earthen dams, roadways, etc. To raise low areas, unfold a 20-foot x 100-foot x 10-mil roll of plastic sheeting and lay it out flat on the area to be raised. Place fill material on the plastic. Fold the plastic over the material, and lay a single row of sandbags on the backside lip of the plastic and on all seams. Fill material can be placed using a bottom dump or dump bed truck or a front-end loader, or manually.

NECESSARY MATERIAL FOR 100 FEET OF

LEVEE PROTECTION:

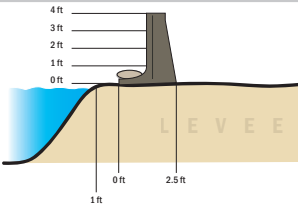
- 2 rolls of 10-mil plastic sheeting
- 4.5 cubic yards of earthen material
- 30 sandbags

SACK TOPPING



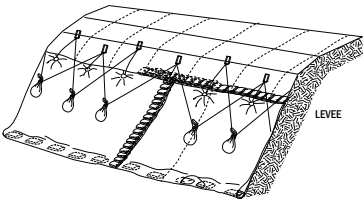
| Linear Feet | 1' h x 2.5' w cross section | | | 2' h x 5' w cross section | | | 3' h x 7.5' w cross section | | | 4' h x 10' w cross section | | |
|-------------|-----------------------------|------------|---------------|---------------------------|------------|---------------|-----------------------------|------------|---------------|----------------------------|------------|---------------|
| | 1-foot height | | | 2-foot height | | | 3-foot height | | | 4-foot height | | |
| | Sand Bags (#) | Fill (ft³) | Labor (Hours) | Sand Bags (#) | Fill (ft³) | Labor (Hours) | Sand Bags (#) | Fill (ft³) | Labor (Hours) | Sand Bags (#) | Fill (ft³) | Labor (Hours) |
| 50 | 300 | 150 | 2.5 | 1,050 | 525 | 8.8 | 2,250 | 1,125 | 18.8 | 3,900 | 1,950 | 32.5 |
| 100 | 600 | 300 | 5.0 | 2,100 | 1,050 | 17.5 | 4,500 | 2,250 | 37.5 | 7,800 | 3,900 | 65.0 |
| 150 | 900 | 450 | 7.5 | 3,150 | 1,575 | 26.3 | 6,750 | 3,375 | 56.3 | 11,700 | 5,850 | 97.5 |
| 200 | 1,200 | 600 | 10.0 | 4,200 | 2,100 | 35.0 | 9,000 | 4,500 | 75.0 | 15,600 | 7,800 | 130.0 |
| 250 | 1,500 | 750 | 12.5 | 5,250 | 2,625 | 43.8 | 11,250 | 5,625 | 93.8 | 19,500 | 9,750 | 162.5 |
| 300 | 1,800 | 900 | 15.0 | 6,300 | 3,150 | 52.5 | 13,500 | 6,750 | 112.5 | 23,400 | 11,700 | 195.0 |
| 350 | 2,100 | 1,050 | 17.5 | 7,350 | 3,675 | 61.3 | 15,750 | 7,875 | 131.3 | 27,300 | 13,650 | 227.5 |
| 400 | 2,400 | 1,200 | 20.0 | 8,400 | 4,200 | 70.0 | 18,000 | 9,000 | 150.0 | 31,200 | 15,600 | 260.0 |
| 450 | 2,700 | 1,350 | 22.5 | 9,450 | 4,725 | 78.8 | 20,250 | 10,125 | 168.8 | 35,100 | 17,550 | 292.5 |
| 500 | 3,000 | 1,500 | 25.0 | 10,500 | 5,250 | 87.5 | 22,500 | 11,250 | 187.5 | 39,000 | 19,500 | 325.0 |
| 550 | 3,300 | 1,650 | 27.5 | 11,550 | 5,775 | 96.3 | 24,750 | 12,375 | 206.3 | 42,900 | 21,450 | 357.5 |
| 600 | 3,600 | 1,800 | 30.0 | 12,600 | 6,300 | 105.0 | 27,000 | 13,500 | 225.0 | 46,800 | 23,400 | 390.0 |
| 650 | 3,900 | 1,950 | 32.5 | 13,650 | 6,825 | 113.8 | 29,250 | 14,625 | 243.8 | 50,700 | 25,350 | 422.5 |
| 700 | 4,200 | 2,100 | 35.0 | 14,700 | 7,350 | 122.5 | 31,500 | 15,750 | 262.5 | 54,600 | 27,300 | 455.0 |
| 750 | 4,500 | 2,250 | 37.5 | 15,750 | 7,875 | 131.3 | 33,750 | 16,875 | 281.3 | 58,500 | 29,250 | 487.5 |
| 800 | 4,800 | 2,400 | 40.0 | 16,800 | 8,400 | 140.0 | 36,000 | 18,000 | 300.0 | 62,400 | 31,200 | 520.0 |
| 850 | 5,100 | 2,550 | 42.5 | 17,850 | 8,925 | 148.8 | 38,250 | 19,125 | 318.8 | 66,300 | 33,150 | 552.5 |
| 900 | 5,400 | 2,700 | 45.0 | 18,900 | 9,450 | 157.5 | 40,500 | 20,250 | 337.5 | 70,200 | 35,100 | 585.0 |
| 950 | 5,700 | 2,850 | 47.5 | 19,950 | 9,975 | 166.3 | 42,750 | 21,375 | 356.3 | 74,100 | 37,050 | 617.5 |
| 1,000 | 6,000 | 3,000 | 50.0 | 21,000 | 10,500 | 175.0 | 45,000 | 22,500 | 375.0 | 78,000 | 39,000 | 650.0 |
| 1,050 | 6,300 | 3,150 | 52.5 | 22,050 | 11,025 | 183.8 | 47,250 | 23,625 | 393.8 | 81,900 | 40,950 | 682.5 |
| 1,100 | 6,600 | 3,300 | 55.0 | 23,100 | 11,550 | 192.5 | 49,500 | 24,750 | 412.5 | 85,800 | 42,900 | 715.0 |
| 1,150 | 6,900 | 3,450 | 57.5 | 24,150 | 12,075 | 201.3 | 51,750 | 25,875 | 431.3 | 89,700 | 44,850 | 747.5 |
| 1,200 | 7,200 | 3,600 | 60.0 | 25,200 | 12,600 | 210.0 | 54,000 | 27,000 | 450.0 | 93,600 | 46,800 | 780.0 |
| 1,250 | 7,500 | 3,750 | 62.5 | 26,250 | 13,125 | 218.8 | 56,250 | 28,125 | 468.8 | 97,500 | 48,750 | 812.5 |
| 1,300 | 7,800 | 3,900 | 65.0 | 27,300 | 13,650 | 227.5 | 58,500 | 29,250 | 487.5 | 101,400 | 50,700 | 845.0 |
| 1,350 | 8,100 | 4,050 | 67.5 | 28,350 | 14,175 | 236.3 | 60,750 | 30,375 | 506.3 | 105,300 | 52,650 | 877.5 |
| 1,400 | 8,400 | 4,200 | 70.0 | 29,400 | 14,700 | 245.0 | 63,000 | 31,500 | 525.0 | 109,200 | 54,600 | 910.0 |
| 1,450 | 8,700 | 4,350 | 72.5 | 30,450 | 15,225 | 253.8 | 65,250 | 32,625 | 543.8 | 113,100 | 56,550 | 942.5 |
| 1,500 | 9,000 | 4,500 | 75.0 | 31,500 | 15,750 | 262.5 | 67,500 | 33,750 | 562.5 | 117,000 | 58,500 | 975.0 |

MUSCLE WALL
TEMPORARY LEVEE



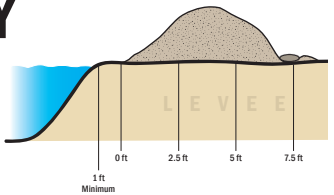
| Linear Feet | MUSCLE WALL Segments (#) | Sand Bags (#) | Fill (ft ³) |
|-------------|--------------------------|---------------|-------------------------|
| 50 | 9 | 90 | 45 |
| 100 | 17 | 170 | 85 |
| 150 | 25 | 250 | 125 |
| 200 | 34 | 340 | 170 |
| 250 | 42 | 420 | 210 |
| 300 | 50 | 500 | 250 |
| 350 | 59 | 590 | 295 |
| 400 | 67 | 670 | 335 |
| 450 | 75 | 750 | 375 |
| 500 | 84 | 840 | 420 |
| 550 | 92 | 920 | 460 |
| 600 | 100 | 1,000 | 500 |
| 650 | 109 | 1,090 | 545 |
| 700 | 117 | 1,170 | 585 |
| 750 | 125 | 1,250 | 625 |
| 800 | 134 | 1,340 | 670 |
| 850 | 142 | 1,420 | 710 |
| 900 | 150 | 1,500 | 750 |
| 950 | 159 | 1,590 | 795 |
| 1,000 | 167 | 1,670 | 835 |
| 1,050 | 175 | 1,750 | 875 |
| 1,100 | 184 | 1,840 | 920 |
| 1,150 | 192 | 1,920 | 960 |
| 1,200 | 200 | 2,000 | 1,000 |
| 1,250 | 209 | 2,090 | 1,045 |
| 1,300 | 217 | 2,170 | 1,085 |
| 1,350 | 225 | 2,250 | 1,125 |
| 1,400 | 234 | 2,340 | 1,170 |
| 1,450 | 242 | 2,420 | 1,210 |
| 1,500 | 250 | 2,500 | 1,250 |

ENVELOPE WAVE
WASH PROTECTION



| Linear Feet | 10 MIL PLASTIC Sheeting (# Rolls) | Sand Bags (#) | Fill (ft ³) | TWINE Rolls (#) | Plastic Buttons | Stakes |
|-------------|-----------------------------------|---------------|-------------------------|-----------------|-----------------|--------|
| 50 | 1 | 15 | 8 | 1 | 5 | 10 |
| 100 | 2 | 30 | 15.0 | 2 | 10 | 20 |
| 150 | 3 | 45 | 22.5 | 3 | 15 | 30 |
| 200 | 4 | 60 | 30.0 | 4 | 20 | 40 |
| 250 | 5 | 75 | 38 | 5 | 25 | 50 |
| 300 | 6 | 90 | 45.0 | 6 | 30 | 60 |
| 350 | 7 | 105 | 52.5 | 7 | 35 | 70 |
| 400 | 8 | 120 | 60.0 | 8 | 40 | 80 |
| 450 | 9 | 135 | 67.5 | 9 | 45 | 90 |
| 500 | 10 | 150 | 75 | 10 | 50 | 100 |
| 550 | 11 | 165 | 82.5 | 11 | 55 | 110 |
| 600 | 12 | 180 | 90.0 | 12 | 60 | 120 |
| 650 | 13 | 195 | 97.5 | 13 | 65 | 130 |
| 700 | 14 | 210 | 105.0 | 14 | 70 | 140 |
| 750 | 15 | 225 | 113 | 15 | 75 | 150 |
| 800 | 16 | 240 | 120.0 | 16 | 80 | 160 |
| 850 | 17 | 255 | 127.5 | 17 | 85 | 170 |
| 900 | 18 | 270 | 135.0 | 18 | 90 | 180 |
| 950 | 19 | 285 | 142.5 | 19 | 95 | 190 |
| 1,000 | 20 | 300 | 150 | 20 | 100 | 200 |
| 1,050 | 21 | 315 | 157.5 | 21 | 105 | 210 |
| 1,100 | 22 | 330 | 165.0 | 22 | 110 | 220 |
| 1,150 | 23 | 345 | 172.5 | 23 | 115 | 230 |
| 1,200 | 24 | 360 | 180.0 | 24 | 120 | 240 |
| 1,250 | 25 | 375 | 188 | 25 | 125 | 250 |
| 1,300 | 26 | 390 | 195.0 | 26 | 130 | 260 |
| 1,350 | 27 | 405 | 202.5 | 27 | 135 | 270 |
| 1,400 | 28 | 420 | 210.0 | 28 | 140 | 280 |
| 1,450 | 29 | 435 | 217.5 | 29 | 145 | 290 |
| 1,500 | 30 | 450 | 225 | 30 | 150 | 300 |

TEMPORARY
EARTHEN
LEVEE



| Linear Feet | 10 MIL PLASTIC Sheeting (# Rolls) | Sand Bags (#) | Fill (yard ³) |
|-------------|-----------------------------------|---------------|---------------------------|
| 50 | 1 | 15 | 2 |
| 100 | 2 | 30 | 4.5 |
| 150 | 3 | 45 | 6.8 |
| 200 | 4 | 60 | 9.0 |
| 250 | 5 | 75 | 11 |
| 300 | 6 | 90 | 13.5 |
| 350 | 7 | 105 | 15.8 |
| 400 | 8 | 120 | 18.0 |
| 450 | 9 | 135 | 20.3 |
| 500 | 10 | 150 | 23 |
| 550 | 11 | 165 | 24.8 |
| 600 | 12 | 180 | 27.0 |
| 650 | 13 | 195 | 29.3 |
| 700 | 14 | 210 | 31.5 |
| 750 | 15 | 225 | 34 |
| 800 | 16 | 240 | 36.0 |
| 850 | 17 | 255 | 38.3 |
| 900 | 18 | 270 | 40.5 |
| 950 | 19 | 285 | 42.8 |
| 1,000 | 20 | 300 | 45 |
| 1,050 | 21 | 315 | 47.3 |
| 1,100 | 22 | 330 | 49.5 |
| 1,150 | 23 | 345 | 51.8 |
| 1,200 | 24 | 360 | 54.0 |
| 1,250 | 25 | 375 | 56 |
| 1,300 | 26 | 390 | 58.5 |
| 1,350 | 27 | 405 | 60.8 |
| 1,400 | 28 | 420 | 63.0 |
| 1,450 | 29 | 435 | 65.3 |
| 1,500 | 30 | 450 | 68 |

PAGE INTENTIONALLY BLANK



OFFICE OF THE SHERIFF

Contra Costa County

LOCAL FLOOD SAFETY PLAN

Levee Maintaining Agency Mapbook

FLOOD CONTINGENCY PLANNING INFORMATION

A.1. SPECIAL FLOOD CONSIDERATIONS

H1 - PUMP STATION 1
Located near station 19+00. Discharge pump may be used during a major flood event; however, additional pumps would be required to dewater the island.

H2 - PUMP STATION 2
Located near station 73+00. Discharge pump may be used during a major flood event; however, additional pumps would be required to dewater the island.

H3 - PUMP STATION 3
Located near station 239+00. Discharge pump may be used during a major flood event; however, additional pumps would be required to dewater the island.

H4 - HOLLAND TRACT BRIDGE
Holland Tract Bridge is the only motor vehicle egress for Holland Tract. A secondary bridge is located in the general vicinity of Sandmound Blvd. Contact the local Reclamation District to gain access to Sandmound Blvd in the event of an emergency.

H5 - FRANKS TRACK OPEN WATER
The flooding threat is predominantly tidal, with some local runoff that can influence conditions. The Old River (on the east side of the island) could pose a riverine flooding threat. Franks Tract (large expanse of open water) can create erosion due to wind/waves.

H6 - WAVE FETCH
The wave fetch is relatively short on the southern, eastern, and western portions of the island and is generally not a concern over much of the District. The northern portion of the island has a wave fetch of up to 3.5 miles across Franks Tract. Channel widths generally vary from 150 to 1,450 feet. The levees are armored with riprap, except some areas along the southern and eastern levees.

H7 - LEVEE STATUS
There is no levee certification status for Holland Tract. The levee geometry generally meets the PL 84-99 Delta Specific Standard.

H8 - TRACT INHABITANTS
Two active marinas are located along the south levee (Lindquist Landing and Holland Riverside Marina), with up to 40 inhabitants living boats at any given time.

H9 - LEVEE ACCESS
County-maintained road is located on the crown of the south levee and portions of the east levee.

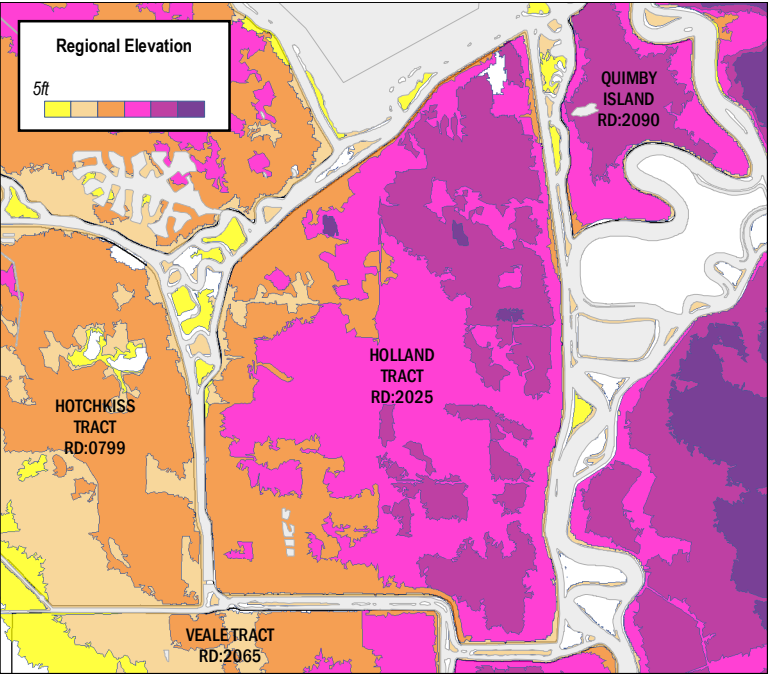
H10 - LAND USES
Portions of the island are farmed or leased for grazing, with operations supported by various facilities and equipment. The island also has permanent habitat sites.

H11 - PUMP STATION INFRASTRUCTURE
Infrastructure includes pumping stations for drainage and associated electrical lines.

LOCAL TOPOGRAPHY

The general elevation ranges are shown by shading within the levee maintenance area below. General areas of high ground and low ground can be derived from the mapping presented below. Large floods, or a dam failure, could result in extreme flood depths. Flood depths may also be significantly greater in depressions such as channels or road cuts or next to obstructions such as railroad embankments. Flood depths may also be significantly less, depending on individual variations in terrain or where structures are raised above general ground elevation.

MAP DATA SOURCE: DRMS Risk Report [URS/JBA 2008c]



B.1. FLOOD CONTINGENCY OPTIONS

H1 - HIGH WATER EVENT
Multiple high water events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Vulnerable area approx.. 2,000 feet. Muscle wall or temporary earthen levee is recommended.

ACTIONS
The District maintains stockpiles of riprap on the island and has equipment available to perform levee maintenance and repairs.
1. Deploy flood fight materials to prevent levee degradation and activate workforce for levee patrols.
2. Prepare resources for temporary earthen levee or muscle wall.
Muscle Wall Material Required:
2000 feet of temporary levee will require approximately 334 segments of muscle wall, 3340 sandbags, and 1670 cubic feet of sand.
OR
Temporary Earthen Levee Material Required:
2000 feet of temporary earthen levee (2ft high x 4ft wide) will require approximately 40 rolls of 10 mil plastic sheeting, 600 sandbags, and 90 cubic yards of fill. Approximately 11.1 cubic yards of fill for sand bags and 78.9 cubic yards of fill for visqueen fill.

H2 - WAVE WASH
Wind waves could occur at this location. Wind waves causing erosion will lead to levee failure if not addressed for long periods of time; protection area approx. 1000 feet.

ACTIONS
The District has flood fight materials stored on-island for use during a flood fight.
1. Deploy flood fight materials to prevent levee degradation.
2. Protect area exposed to wind waves with envelope style wrap.
Wave Wash Protection Material Required:
1000 feet of envelope wave wash will require approximately 20 rolls of 10 mil plastic sheeting, 300 sandbags, 150 cubic feet of sand, 20 rolls of twine, 100 plastic buttons or rocks, and 200 [1" x 3" x 2'] stakes.

H3 - BOIL FROM SEEPAGE THROUGH LEVEE
Boil events caused by large volumes of discharge from regional and local drainage system, coupled with tides and low atmospheric pressure. Not associated with wind generated waves and erosion. Response to boils require sack ring, or boil ring, to control water flow and pressure through levee to minimize transport of fine material through seepage that has uncontrolled flow of water and transport of levee material. Tides and low pressure can play a part in both wind and seepage impact potential.

ACTIONS
1. Protect and isolate seepage area with boil sack ring.

C. REPAIR CONTRACTORS & MATERIAL SUPPLIERS

| FLOOD FIGHT LABOR | | |
|--|-------------------------------------|-------------------------------------|
| Labor Ready Sacramento 916.374.9501 | Labor Ready Concord 925.827.2352 | Labor Ready Oakland 510.981.8226 |

| REPAIR CONTRACTORS | | | |
|--|--|---|---|
| Dutra Group 160 River Rd, Rio Vista, CA 707.374.5127 | Teichert Construction 24207 County Rd 100A, Davis, CA 530.406.4200 | Teichert Construction 4401 Duluth Ave, Roseville, CA 916.645.4800 | Teichert Corporate Office 3500 American River Dr, Sacramento, CA 916.484.3011 |

| MATERIALS SUPPLIERS | | |
|--|---|---|
| Dutra Materials 615 River Rd, Rio Vista, CA 707.374.6964 | Teichert Aggregates 4249 Hammonton Smartville Rd, Marysville, CA 530.743.6111 | Teichert Aggregates 8760 Kiefer Blvd, Sacramento, CA 916.386.6905 |
| Dutra Materials 1000 Point San Pedro Rd, San Rafael, CA 415.459.7740 | Teichert Aggregates 3331 Walnut Ave, Marysville, CA 530.749.1230 | Teichert Aggregates 35030 County Rd 20, Woodland, CA 530.661.4290 |

| | | |
|--|--|--|
| Syar Industries 16560 County Rd 89, Esparto, CA 530.787.2020 | Teichert Aggregates 3417 Grant Line Rd, Rancho Cordova, CA 916.351.0123 | Teichert Ready Mix 8950 Cal Center Dr, #165, Sacramento, CA 916.361.5000 |
| Syar Industries 885 Lake Herman Rd, Vallejo, CA 707.643.3261 | Teichert Aggregates 13333 White Rock Rd, Rancho Cordova, CA 916.985.2052 | |

| LOCAL SUPPLY PROVIDERS | | |
|--|---|--|
| Ace Hardware Antioch 501 Sunset Dr, Antioch, CA 925.757.2500 | Ace Hardware Pittsburg 125 E Leland Rd, Pittsburg, CA 925.432.6089 | Home Depot Brentwood 5631 Lone Tree Way, Brentwood, CA 925.513.6060 |
| Ace Hardware Brentwood 8900 Brentwood Blvd, Ste J, Brentwood, CA 925.634.3201 | Lowe's Antioch 1951 Auto Center Dr, Antioch, CA 925.756.0370 | Home Depot Pittsburg 2300 N Park Blvd, Pittsburg, CA 925.473.1900 |
| Ace Hardware Oakley 305 5th St, Oakley, CA 925.625.2449 | Lowe's Antioch 5503 Lone Tree Way, Antioch, CA 925.779.6060 | |

Holland Tract

RD 2025

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

FLOOD CONTINGENCY OPTIONS

D3 Flood Contingency Option D2 Special Flood Consideration

LEVEE INFORMATION

1000-Foot Levee Stationing
Levee Centerline
Tide Gate Agricultural Return Drain/Siphon
Levee Access Point Levee Crossing

RESPONSE INFORMATION

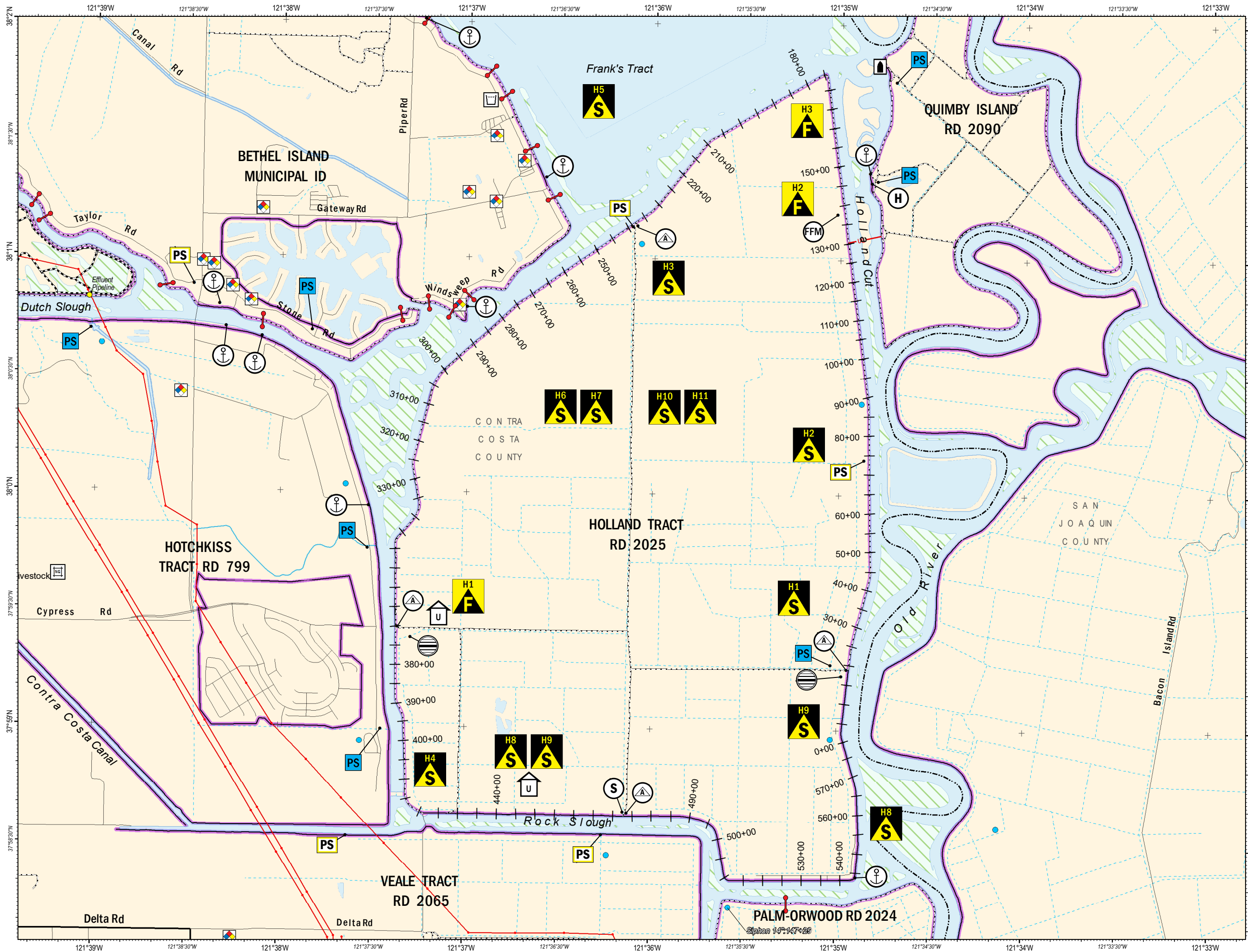
Structure T (type) [A - Agricultural, R - Residential, S - Seasonal, U - Unknown]
(count) - [Approx. Structure Count]
Boat Landing Command Post
Supply Delivery Point Command Post Secondary
Field Stockpile Pump Station
Flood Fight Material Pump Station Agricultural
Helispot
Supply Staging

REFERENCE INFORMATION

Ferry Communication Facility
Potable Water Facility Waster Water Facility
Solid Waste Facility Natural Gas Facility
Hazardous Material
UG Underground Power Line
Transmission Line
UG Underground Gas Line
County Boundary

0 1,100 2,200 4,400 Feet

Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:28,600



PUBLIC SAFETY INFORMATION

A.1. MONITORING

Critical gauges may be accessed on the internet at m.waterdata.usgs.gov or water.weather.gov

The QR codes presented at the right and below can be scanned on a mobile device with any QR code scanning application to link the user directly to the web addresses shown above.

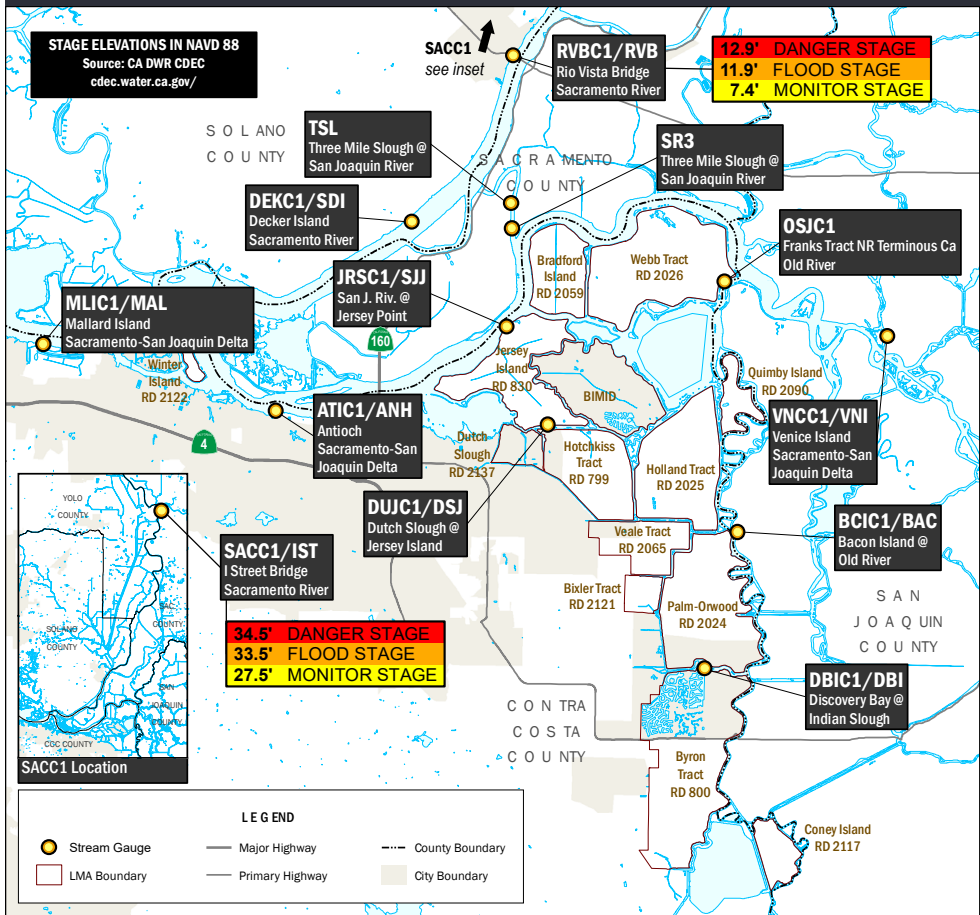
Individual live gauge charts can be accessed via the QR codes below, while the USGS Mobile Water Data web application can be accessed via the QR code to the right.

USGS Mobile Water Data



| | | |
|-------------------------------------|--|---|
| SACC1/IST I Street Bridge | RVBC1/RVB Rio Vista Bridge | DEKC1 Decker Island |
| MLIC1/MAL Mallard Island | JRSC1/SJJ SJ Riv. @ Jersey Pt | OSJC1 Franks Tract, Terminous |
| ATIC1/ANH Antioch | DUJC1/DSJ Dutch Slough @ Jersey Island | VNCC1/VNI Venice Island |

A.2. PATROL TRIGGER



B.1. STAGING AREAS

The following sites have been identified for use as staging areas for incoming resources.

FLOOD FIGHT STAGING

The staging area will be located at the south end of Center Road near station 472+00 37°58'38.69887440"N, 121°36'08.57300040"W

B.2. SUPPLY DELIVERY LOCATION

The following sites have been identified for use as supply delivery points for incoming resources.

No Known Supply Delivery Points in Map Extent

B.3. STOCKPILE RESOURCES

The following sites have been identified as pre-existing earthen material/fill material stockpiles.

RIP RAP STOCKPILE

Rock stockpile stored on island for immediate use in flood fight. 37°59'13.85517480"N, 121°34'58.53153000"W

RIP RAP STOCKPILE

Rock stockpile stored on island for immediate use in flood fight. 37°59'22.88007600"N, 121°37'17.56632360"W

B.4. FLOOD FIGHT RESOURCES

The following sites are designated equipment resources in a flood fight scenario.

FLOOD FIGHT MATERIALS

Inventory meets DWR requirements: Visqueen, sandbags, twine, stakes, tie buttons, pliers, sledge hammers, shovels, life vests, survey lathe, flagging tape, markers, pencils and pads, spotlight, tool box and lock. 38°01'11.73844200"N, 121°35'01.07962440"W

B.5. HAZMAT LOCATIONS

The following sites have been identified as containing hazardous materials.

No Known HazMat Locations in Map Extent

C.1. COMMUNICATIONS SUPPORT

COUNTY OFFICES

CONTRA COSTA COUNTY SHERIFF'S OFFICE/DEPARTMENT

Evacuation
925.335.1500, Information
925.646.2441, Emergency

CONTRA COSTA COUNTY FIRE PROTECTION DISTRICT

Evacuation/Rescue
925.941.3330

CONTRA COSTA COUNTY OFFICE OF EMERGENCY SERVICES

CCC OES
925-228-5000, 24-HOUR

CONTRA COSTA COUNTY PUBLIC WORKS DEPARTMENT

Debris Management
925.427.8562

COUNTY ICS/EOC OPS

CONTRA COSTA COUNTY

925.646.4461, Office
925.228.5000, 24-Hour

SAN JOAQUIN COUNTY

209.953.6200, Office,
209.468.4400 Emergency

YOLO COUNTY

530.406.4930, Office
530.666.8920 24-Hour

SACRAMENTO COUNTY

916.874.4670, Office
916.875.5000, Night
916.875.6900, Night

SOLANO COUNTY

707.784.1600, Office
707.421.7090, Night

RESPONSE SUPPORT

AMERICAN RED CROSS

Sheltering
800.733.2767

DWR STATE-FEDERAL FLOOD OPERATIONS CENTER

Coordination for Support
916.574.2619

CALTRANS

Evacuation/Bridge Support

916.654.2852

CALIFORNIA CONSERVATION CORPS

Environmental/Disaster Response
916.341.3100

LMA CONTACTS

BIXLER TRACT (RD 2121)

Tom Bloomfield
925.550.5540

BYRON TRACT (RD 800)

Jeff Conway
925.584.8542 Bus.

HOTCHKISS TRACT (RD 799)

Dina Holder
925.684.2398

QUIMBY ISLAND (RD 2090)

Al Warren Hoslett
209.943.5551, Bus.

BIMID

Regina Espinosa
925.684.2210
Lawrence Martins
925.383.8310

CONEY ISLAND (RD 2117)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus. Cell

JERSEY ISLAND (RD 830)

Chad Davidson
925.625.2279
ER Contact
925.727.2938

VEALE TRACT (RD 2065)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

BRADFORD ISLAND (RD 2059)

Dominick Gulli
209.478.6525
Bus. 209.649.4555, Bus. Cell

DUTCH SLOUGH (RD 2137)

Nate Hershey

916.456.4400

HOLLAND TRACT (RD 2025)

David A. Forkel
925.932.0251
925.693.9977

PALM-ORWOOD TRACT (RD 2024)

Dante Nomellini
209.465.5883, Bus.
809.969.7755, Bus Cell

WEBB TRACT (RD 2026)

Al Warren Hoslett
209.943.5551, Bus.

WINTER ISLAND (RD 2122)

Robert Calone
925.432.3300

Holland Tract

RD 2025

The symbology presented in the legend below is global to the project area, some symbols may not be present on map

TRANSPORTATION

Gate

ROADS

Interstate Highway Major Road Local Road Trail, Major Trail

LEVEE INFORMATION

1000-Foot Levee Stationing
Levee Centerline

Tide Gate
Levee Access Point
Historic Levee Breach
Levee Erosion
Levee Seepage

Agricultural Return Drain/Siphon
Levee Crossing

RESPONSE INFORMATION

Structure
T (type)
[A - Agricultural; R - Residential; S - Seasonal; U - Unknown]
(count) - [Approx. Structure Count]

Boat Landing
Supply Delivery Point
Field Stockpile
Flood Fight Material
Supply Staging

REFERENCE INFORMATION

Fire Station
Home Care
Ferry
Hazardous Material
School
Ag. Worker Camp
Dam

Underground Power Line
Transmission Line
Underground Gas Line
County Boundary

0 1,100 2,200 4,400 Feet

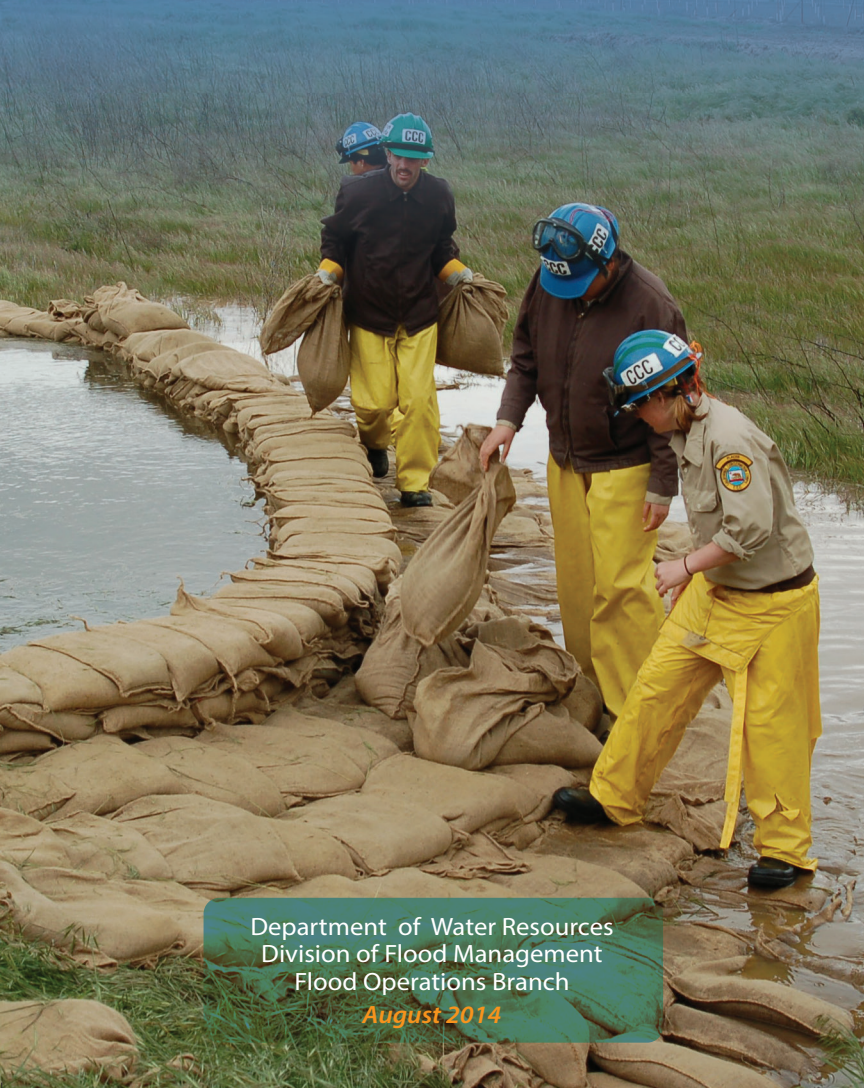
Map projection and scale:
NAD 1983 StatePlane California III FIPS 0403 Feet, 1:28,600

STATE OF CALIFORNIA

EMERGENCY

FLOOD FIGHTING

Methods



Department of Water Resources
Division of Flood Management
Flood Operations Branch

August 2014

STATE OF CALIFORNIA
CALIFORNIA NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

FLOOD FIGHTING

Methods



Division of Flood Management
Flood Operations Branch

August 2014

Prepared by
Rick Burnett
Water Resources Engineering Associate

with assistance from
DWR Graphic Services



Table of Contents

| | |
|-----------|---|
| 2 | <i>Foreword</i> |
| 3 | <i>Levee and Embankment Threats</i> |
| 3 | <i>Patrolling</i> |
| 5 | <i>Filling Sandbags</i> |
| 7 | <i>Passing Sandbags</i> |
| 8 | <i>Sandbag Construction</i> |
| 9 | <i>Control of Overtopping</i> <i>(Sack Topping, Temporary Levee)</i> |
| 12 | <i>Control of Boils</i> |
| 16 | <i>Wavewash Protection</i> |
| 22 | <i>Raincoat Method</i> |
| 23 | <i>Emergency Spillway</i> |
| 24 | <i>Structure Protection / Diversions</i> |
| 28 | <i>Water / Storm Drain Protection</i> |
| 29 | <i>Flood Fight Safety</i> |
| 33 | <i>Flood Fighting Terminology</i> |
| 36 | <i>Reference Guide</i> |
| 37 | <i>Flood Fight Material/Equipment List</i> |
| 38 | <i>Levee Profile</i> |

Foreword

The California Department of Water Resources (DWR), Division of Flood Management has been tasked to prevent, reduce, and mitigate the risk of damages associated with flooding. For over fifty years DWR has been the lead State agency responsible for responding to this costly natural disaster. Our mission is to prevent loss of life and damage to property and infrastructure.

Working together State, federal, and local agencies manage California's Flood Control System which consists of reservoirs, levees, weirs, bypasses, and retention debris basins.

This statewide system is managed with support from technologies such as weather and water forecasting, coordination of reservoir releases and a network of rain and stream gauges and snow pack monitoring. The information gathered is extremely important to emergency responders and the public.

The 'Flood Fighting Methods' outlined in this booklet have proven effective during many years of use by DWR, United States Army Corps of Engineers, and local agencies on flood-related emergencies. This handbook is published by the DWR Flood Operations Branch and is designed to be used with the Flood Fighting Methods class.

Levee and Embankment Threats

The main causes of levee failure or flood related problems due to high water are:

- Seepage through or under the levee heavy enough to cause a "boil".
- Erosion of the levee or embankment due to swift moving water or wave action.
- Overtopping resulting from water-surface elevations higher than the levee or embankment.

Patrolling

The best defense against flood related issues and/or levee failure is to identify problems early and repair them immediately. Biannual levee inspections and effective high water patrolling make this possible. The following suggestions will help in organizing patrol teams for this work.

- Operate under the SEMS / ICS system and report to the appropriate section chief.
- Provide a sufficient number of workers for two 12 hour shifts.
- Provide each worker with a copy of this 'Flood Fighting Methods' handbook.
- Assign two people to each mobile patrol.
- Assign each mobile patrol vehicle an area no larger than can be inspected at least every 2 hours, with more frequent patrols as conditions warrant. Foot patrols may offer a more thorough inspection.

- Furnish each mobile patrol vehicle with radio/cell phone or other communication equipment, lights for night patrol, and the following materials: Laths, survey ribbon, permanent marker, pad and pencil, flashlight with extra batteries, 2 shovels, 1 sledge hammer, approximately 50 sandbags (empty), 1 roll of plastic sheeting (visquine), 1 box twine, 100 buttons, 25 wooden stakes, lifeline, personal floatation devices, blanket, First Aid kit, Directory of Flood Officials, and Flood Emergency Phone Card. (see Reference Guide on page 36)
- Identify potential problems: boils, seepage, erosion, cracks, sloughing etc.
- Instruct each patrol team on the correct filling and placement of sandbags. They should know what danger signs to watch for, and how to signal for help.
- Vehicles should remain on high ground in threatened areas. Always have escape routes and make them known to all responders.
- Instruct each leader to check with their team members frequently. Investigate all reported problems.
- Be aware of the locations of stockpiled flood fighting materials, tools and equipment.
- Be prepared to request additional resources on short notice.
- Advise the officials of the district or agency responsible for emergency assistance in the area and if necessary, request their help, i.e. local emergency services office.
- Contact the nearest representative of the Department of Water Resources for technical advice and assistance.

Filling Sandbags

When filling sandbags you should work in pairs, with one person holding the bag while the other shovels in the fill material. The bag holder should find the most comfortable position while holding the bag open (see Figure 1 page 6). **The most common mistake made is overfilling bags.** The first shovel of material should be placed on the lip of the bag to help hold the bag open. The shoveler should use rounded scoops of material until the bag is approximately 1/3 full. Avoid extra movements (turning or twisting of the back) to prevent injury and reduce fatigue.



Filling Sandbags



Figure 1: Proper sandbag filling

Passing Sandbags



Passing Sandbags

To avoid injuries and maximize productivity emergency responders can be organized into a sandbag passing line or 'chain'.

The line is formed by standing facing the next person and slightly off set. The bags are passed down the center of the chain. Do not throw bags.



Passing Sandbags

Sandbag Construction

The use of sandbags is a simple but effective method of preventing or reducing damage from floodwater and debris (see Figure 2). Suggestions for constructing sandbag structures are:

1. Close-weave burlap bags 18" x 30" are recommended for all sandbag construction when available.
2. Fold the empty top of the bag at a 45-degree angle to keep sand from leaching out.
3. Place each bag over the folded top of the preceding bag and stomp into place.
4. Stagger the second layer of bags over the seams of the preceding layer.
5. Stomp all bags to form a tight seal.
6. The last sandbag in a line is referred to as a Key Sack. The empty top of this bag is folded under and stomped into place.



Sandbag Wall Construction

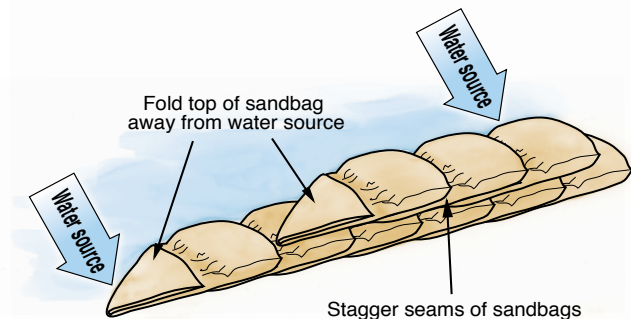


Figure 2: Fill sandbags 1/3 full, fold top of sandbag away from water source and stagger seams of sandbags.

Control of Overtopping

If a levee or stream bank is lower than the anticipated high water elevation, an emergency topping should be constructed to raise the grade above the forecast flood height. A sack topping may be required at road or stock crossings, low levee sections, or railroad crossings. The following sections discuss various methods for increasing levee and bank elevations.

Sack Topping

The most common form of flood control work is the use of sandbags for construction of temporary walls. The use of sandbag walls to increase the height of a levee section is called "sack topping" (see Figure 3). The sacks are laid "as stretcher rows," or along the levee.

Alternate layers can be crossed if additional strength is needed. The sacks should overlap at least one-third and be stomped firmly into place. When properly placed and compacted, each sack layer will provide about 3 to 4 inches of elevation.

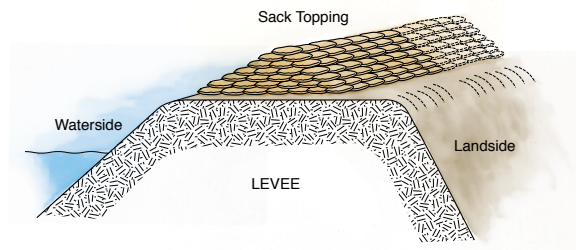


Figure 3: Sack topping on a levee



Sack Topping

Temporary Levee

This method is used to raise low areas during high water periods to prevent overtopping of levees, stream and riverbanks, small earthen dams, roadways, etc. To raise low areas, unfold a 20'x100'x10 mil roll of plastic sheeting and lay out flat on area to be raised (see Figure 4). Place fill material on plastic. Fold plastic over material, lay a single row of sandbags on the backside lip of plastic and on all seams. Fill material can be placed using bottom dump or dump bed trucks, front-end loader or manually.

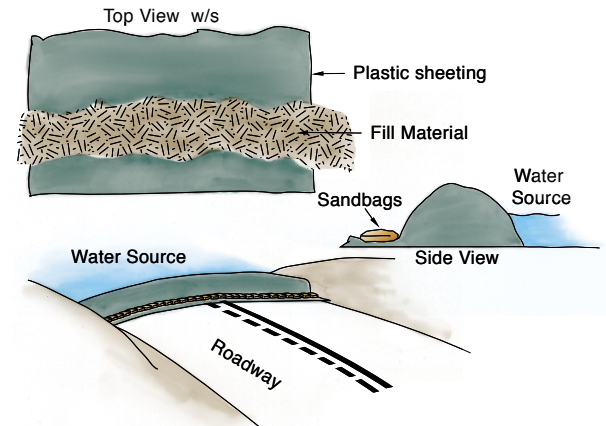


Figure 4: Temporary levee



Temporary Levee

Lumber and Sack Topping

Wooden panels are used on the waterside shoulder and reinforced on the opposite side with sandbags. The method is used to raise subsided areas during high water and divert debris flows (see Figure 5). Stakes 2"x 4"x 6' should be driven on the waterside shoulder 6 feet apart. A shallow trench is dug and lined with empty sandbags to provide a seal. Pre-constructed wooden panels are placed in the

trench and nailed to the landside of the stakes. This wall should then be backed with enough sandbags to support the panels against the expected high water. Attach 2"x 4"x 10' lumber kickers to the stakes that support the panels, and drive 2' stakes into the levee crown. Use at least two nails at each joint to provide rigid construction.

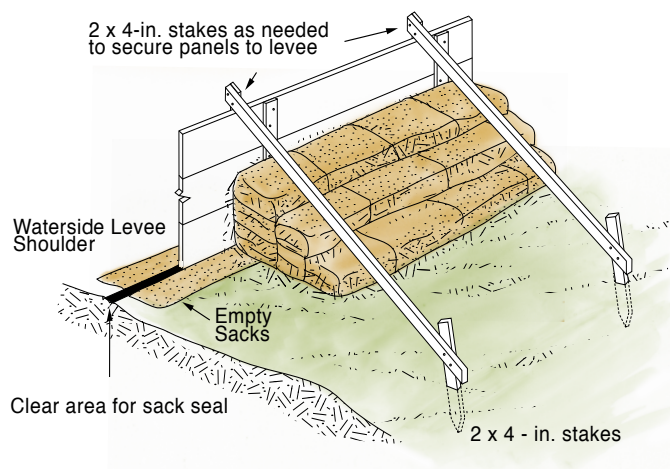


Figure 5: Lumber and sack topping

Control of Boils *(Away from Levee)*

A boil is a condition that occurs when water is “piped” through or under a levee and resurfaces on the landside. These weak points are generally caused by burrowing rodents or decomposed tree roots. High water pressure can begin to erode the interior of the levee and weaken the structure. Levee material will deposit around the exit point as the water discharges on the landside. If the boil is determined to be “**carrying material**” then corrective action is required to control the situation.

If left unattended the material that makes up the levee can be eroded at an accelerated pace, causing subsidence and overtopping of the levee. This could result in a levee break.

The common method for controlling a boil is to create a watertight sack ring around it. The sandbag structure should be high enough to slow the velocity of the water and prevent further discharge of material from the boil (see Figures 6 & 7). The flow of water should never be stopped completely, this may cause the boil to “break out” in an area near the existing sack ring. A spillway must be constructed to direct water away from all boil sites.

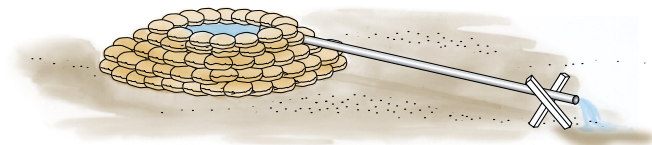


Figure 6: Boil sack ring

Bottom width should be at least 1 1/2 times the height. Do not sack boils that are not carrying material, but continue to monitor. Boils can begin to carry material after first located.



Boil Sack Ring

The sack ring should be large enough to enclose the area immediately surrounding the discharge point (3 to 4 feet diameter). If several boils carrying material are found, a single large sack ring may be constructed around the entire “nest” of boils.

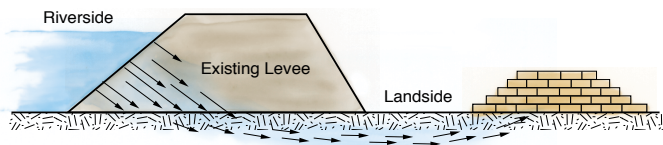


Figure 7: Flow of water through a levee

Control of Boils (On Levee Slope)

If the boil is close to or on the levee slope, a U-shaped sack ring may be built around the boil and keyed into the slope. Construction of this method can be difficult and requires substantial shoring up of the U-shaped sack ring structure. A spillway must be constructed to direct water away from all boil sites (see Figure 8).

NEVER completely stop the flow from a boil. This may cause the boil to "break out" in an adjacent area. ALWAYS control the boil to a point where it ceases to carry material and the water runs clear.



"U" shape Sack Ring

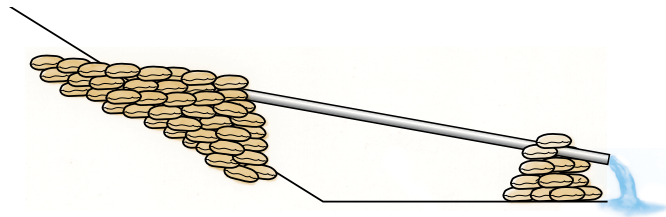


Figure 8: Spillways can be constructed by nailing two 2"x 6" boards together to form a V notch; PVC pipe; two parallel sandbag rows; visquine, etc.

Waterside Boil Inlet Detection

Water running through a levee and carrying material can sometimes be stopped on the waterside, thus eliminating the building of sack rings on the landside (see Figure 9). A six foot long section of 2" diameter metal pipe secured to a 5'x 6' foot piece of plastic or canvas can be rolled over the inlet hole on the waterside. Drive 1"x 3"x 2' stakes into the shoulder of the levee. Suspend half-filled sandbags on top of rolled-out material with twine and tie off to stakes. It can be difficult to locate the waterside inlet of boils. Sometimes a swirl is observed at the water's edge.

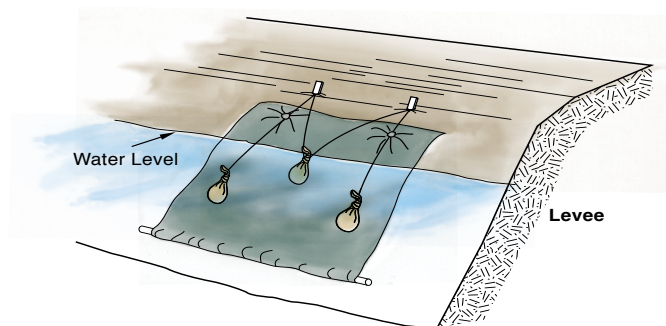


Figure 9: Waterside boil protection

Wavewash Protection

All levees adjacent to wide stretches of water should be watched during periods of strong wind to detect the early stages of wavewash erosion. If the slope is well sodded, short periods of high wind should cause little damage. However during sustained periods of strong wind and high water, experienced personnel should observe and monitor the effected areas.

Envelope Method

When used correctly, plastic sheeting is useful for wavewash protection. Visquine should be purchased in 10 mil rolls, 20 feet wide by 100 feet long. 1"x3"x2' wooden stakes are driven into the ground just above the levee shoulder on the side you wish to protect. Place the stakes 4 feet apart and stagger vertically by 1 foot as shown in Figure 10.

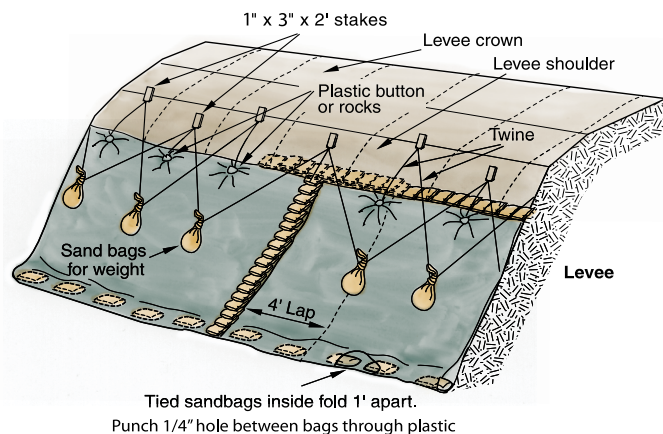


Figure 10: Wavewash Protection



Wavewash Protection

Avoid driving stakes in a straight line; this can cause cracking and sloughing of the slope. To provide added strength and leverage, drive stakes at a slight angle away from the water source with the wide (3") side facing the water. Be sure the stakes are well into the ground and are secure.

Role out the plastic sheeting along the waterside shoulder. Eight to ten people should assist in shaking out the folds of the envelope. Be sure that both layers are held while the envelope is shaken out. Hold on tight! Use caution in strong winds. If the wind catches the plastic it could billow out and pull you along with it.

While flood workers hold the plastic securely, toss tied sandbags into the envelope. The tied sandbags (see Figure 12, page 20) are thrown into the bottom of the envelope with a one-foot gap between bags. The tied bags provide weight to hold the plastic against the levee slope.

A tie-down button or small stone (preferably round) is secured through both layers of visquine. If a stone is used, tie a slip knot and double half-hitch to secure it. Fasten buttons to the visquine and tie off to the stakes using a minimum 250 lb. tensile strength twine with these points in mind: (See Figure 11).

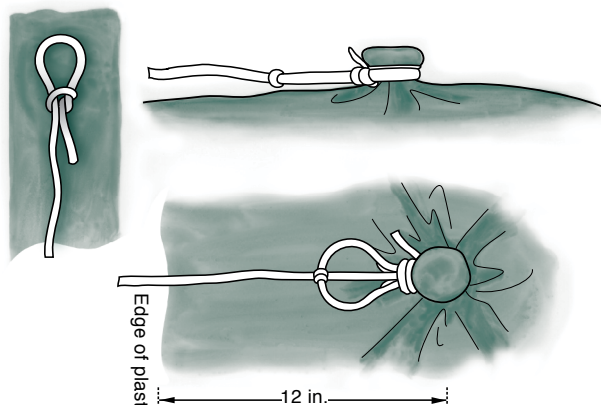


Figure 11: Plastic Tie-Down Buttons

1. Fasten button at least 1 foot from the edge of the plastic.
2. Fasten button to both layers of plastic.
3. Fasten button directly below stakes (one button per stake).
4. Tie twine low on stake for strength and to reduce tripping hazard.

Plastic sheeting is secured using tie down buttons. To attach plastic buttons to the envelope, tie a slipknot on the end of the twine; place loop over button and plastic and draw tight. Tie two half-hitch knots around the button frame. Extend twine to large end of frame, tie a half-hitch knot around the end, and secure twine to stake (see Figure 11).

With the envelope secured to the stakes, punch a small hole between each tied bag in the envelope, (a pencil works well). These holes release water trapped in the envelope. DO NOT use a knife because a slice or slit will tear and



Button Tying

spread in the plastic. If further slope protection is necessary insert an additional envelope into the existing wavewash protection, overlapping at least four feet. To secure the overlap to the stakes attach the two top layers with one button and the two bottom layers with another. The buttons line up with the stakes that are four feet apart. There should be four buttons securing the two envelopes.

Using a continuous piece of twine, hang tied bags from stakes in a zigzag fashion as shown in Figure 10. Tie a double half-hitch knot below the knot in each sandbag. **Place each bag so that it hangs at the middle of the plastic directly below the next stake.** Attach twine to every other stake with a double half-hitch. Add a second row of tied bags suspended from the stakes previously skipped. These bags will keep the plastic lying flat against the levee slope in windy conditions. If the upper portion of the slope needs protection, use an additional envelope. Be sure to place the upper layer over the lower layer by 2 to 3 feet. Finally place sandbags along all seams to prevent wind and water from entering the envelope. To prevent slippage, make sure the sandbags forming the top seam cap are half on the plastic and half on the levee as shown in Figure 10. If the levee slope is too steep, some of the bags on the seam may be tied off with twine to the stake above the envelope for support.

Remember, wind is your worst enemy. When using plastic sheeting, be sure all seams are secured with sandbags, and make needed repairs to the envelope as soon as possible.

Tying Sandbags

Most sandbags are used with the open end folded. In some cases sandbags will have to be tied. Fill the bag 1/4 to 1/3 full of material. See Figures 12A–12D for instructions.



Figure 12A: Sandbag filled 1/4 to 1/3 full



Figure 12B: Grasp bag at top corner and spin

Figure 12C: The long tail should be twisted tightly and look like a piece of rope.

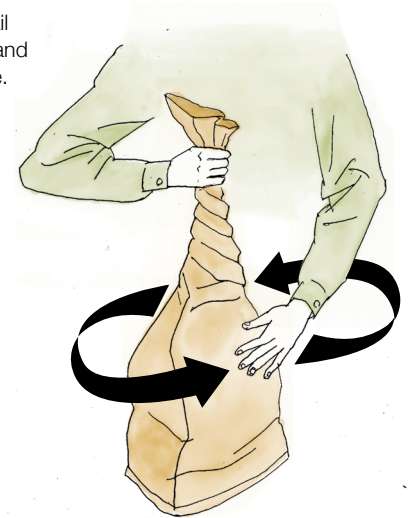


Figure 12D: Tie an overhand knot (pretzel knot) as low as possible on the bag.

Raincoat Method

The raincoat method is used to prevent further saturation of levee or hillside slopes. Plastic sheeting is laid out flat on the slope, sandbags are placed around the perimeter with additional bags placed randomly for weight. If the slope is steep, wooden stakes can be driven into the ground just above the area to be protected. The stakes are 4 feet apart with a 1-foot stagger. The plastic is secured to the stakes with tie-down buttons or small round rocks (see Figure 13).

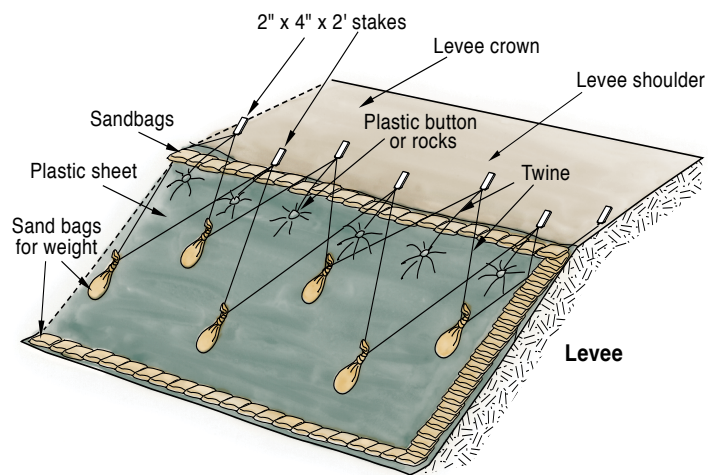


Figure 13: Raincoat method

Use a crisscross method of placing the sandbags (Figure 13) on the plastic. Place a solid row of sandbags on all edges of the plastic (half on the ground, half on the plastic).

Emergency Spillway

To prevent damage to the levee slope due to overtopping, an emergency spillway can be constructed.

Place plastic sheeting over area to be used for spillway. Line all sides with at least a single row of sandbags. Use additional tied sandbags on plastic for weight if needed. Extend spillway beyond the levee toe if necessary.

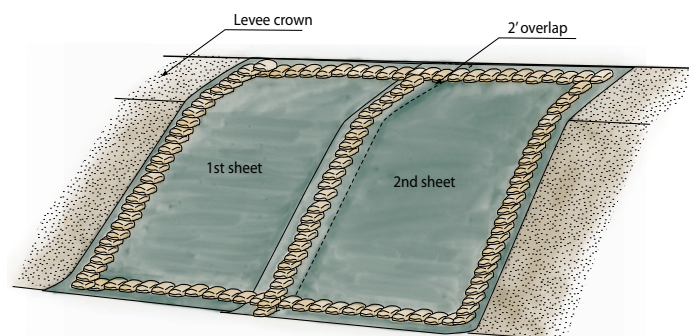


Figure 14: Emergency spillway using plastic sheeting and sandbags



Emergency Spillway

Structure Protection/Diversions

The main causes of damage to structures, homes, and property during heavy rains or flood flows are:

1. Flood water from overwhelmed storm drains and urban diversions, particularly on sloping streets.
2. Flood flows onto property through driveway openings and low spots in curbs.
3. Debris flow from hillsides that have been cleared of vegetation by fire or development.

The flood fighting methods described in the following sections have proved effective in combating floodwaters and debris flows.

Diverting Water or Debris Flows Away from Structures

Homes and structures can be protected from floodwater or debris flows by redirecting the flow as shown in Figure 15. Sandbag barriers must be long enough to divert the flows away from all structures. Barriers constructed of sandbags or lumber can also be used to channel mud and debris away from property improvements.



Structure Protection



Structure Protection

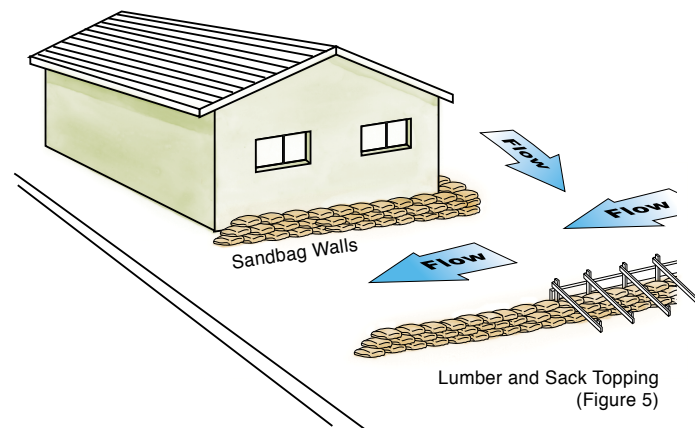


Figure 15: To divert mud, debris, and water, use sandbag walls or lumber and sack topping

Structure Protection

The following method is used for protection of buildings and other structures along lake shores and in similar situations where water is rising with little or no current.

Lay plastic sheeting on the ground and up the building walls to a point at least 1 foot above the predicted water elevation. Place sandbags on the plastic sheeting in the form of a half pyramid against the structure (see Figure 16). Secure plywood over doors and vents. Overlap plastic sheeting and sandbags at corners of buildings.



Home Protection

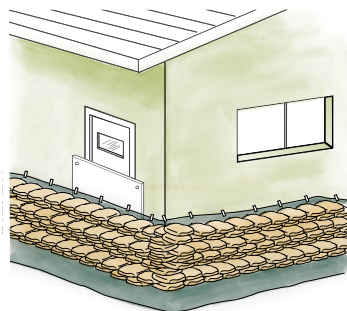
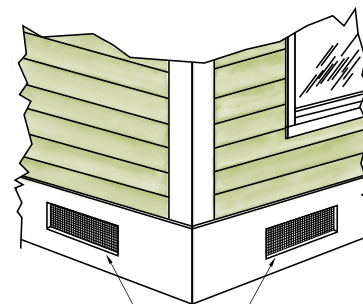


Figure 16: Structure protection

Wet Flood Proofing Requirements for Structures Located Within Special Flood Hazard Areas

National Flood Insurance Program regulations require that buildings on extended wall foundations or that have enclosures below the base flood elevation must have foundation or enclosure wall openings. These openings prevent the foundation or enclosure walls from weakening or collapsing under pressure from hydrostatic forces during a 100 year flood event. The openings allow flood waters to reach equal levels on both sides of the foundation or enclosure wall and minimize the potential for damage from hydrostatic pressure.

THESE OPENINGS MUST NOT BE BLOCKED IF THE BUILDING IS LOCATED WITHIN A SPECIAL FLOOD HAZARD AREA.



Foundation or wall openings must be kept open within special flood hazard areas

Figure 17: Foundation and wall openings in structures

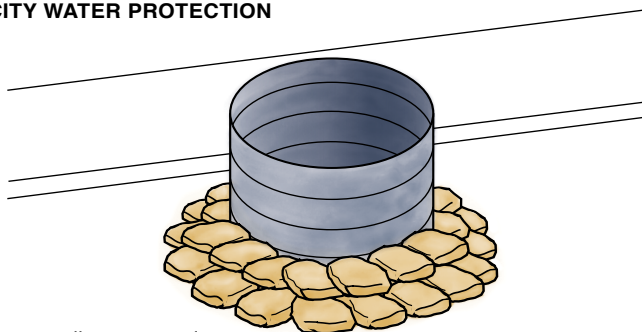
For details refer to FEMA Technical Bulletins TB1-93 and TB-7. These bulletins may be obtained from the FEMA web site at:

<http://www.fema.gov>

Water / Storm Drain Protection

Water or sewer systems can be protected by placing corrugated metal pipe (CMP) over the utility hole (see Figure 18). Lay plastic sheeting up the walls of the CMP and place sandbags in the form of a half pyramid around the CMP to seal it to the pavement. This method will prevent mud and debris from entering the system and also act as a surge chamber.

CITY WATER PROTECTION



Use sandbags to seal pipe to pavement.

Using corrugated metal pipe (CMP) over utility hole to isolate sewer line or prevent contamination of water system.

Figure 18: Water / storm drain protection

Flood Fight Safety

Numerous potential hazards exist during flood events. These hazards are manageable if identification and communication occur on an ongoing basis. Personal safety requires a conscious effort that every flood fighter must consider in their various duties and activities.

- **Changing Weather Patterns:** This occurrence can affect existing conditions and create more serious situations. Always know the forecast and how it affects vulnerable areas, workers and the public.
- **Changing Water Patterns:** The rise and fall of water can occur gradually or very quickly. Knowledge of high water and how it relates to levees, communities, and workers is essential. Continuous monitoring and communication of water level influences (i.e. reservoir releases, tides, and drainage inflow) are very important. Always know your area and the flood history around you.
- **Swift Water:** High velocities of water are common during flooding events. Extreme caution should be used when anyone is exposed to high water. Workers should have flotation devices, throw ropes, and lifelines in the immediate area. Swift water rescue teams may be available. Use common sense and sound judgement around swift water. Know your resources and how to activate them prior to the event.
- **Temperature Related Illness:** During a flood fight, weather patterns can change constantly. Changes in temperature present the potential for hypothermia and heat exhaustion/stroke. Flood fighters should know the signs of distress for these types of illnesses and how to treat them. During cold, wet weather it is recommended that

workers layer clothing to stay warm and dry. A dry blanket and warm clear fluids should be on the work site for emergency use. In warm, hot weather lightweight clothing is recommended. If skin is exposed, a sun block agent may need to be applied. Plenty of drinking water should be on site and consumed regularly. Headgear is recommended in both hot and cold situations.

- ***Insect/Animal Exposure:*** Flooded areas force a variety of animals to evacuate to high ground. Workers in these areas should be aware of these animals and not handle them. If animal removal is needed, contact a local professional. Stinging and biting insects are prominent in certain flood-prone areas. Chemical repellents can be useful as a deterrent. A complete first aid kit should be on site.
- ***Vegetation:*** Noxious plants such as star thistle, stinging nettle, and poison oak are commonly found along rivers, streams, and levees. Avoid direct contact with this type of vegetation to prevent itching and rash. Consult medical personnel if symptoms persist.
- ***Sandpile Safety:*** When shovels are used for filling bags a safe distance for workers is essential. Sandbags and sand may contain contaminants. Have disinfectant available. Safety glasses or goggles are recommended for protection from blowing sand particles.
- ***Contamination:*** Flooded areas can potentially carry high levels of contaminants. Common contaminants include fuel, sewage, and pesticides. Local Haz-Mat teams should be contacted if needed. Always wear protective clothing to help limit contact with water. Carry antibiotic hand soap and wash thoroughly after working around floodwater.
- ***Exhaustion:*** Stress combined with long, physically demanding hours can have an adverse effect on the flood

worker. It is very important to recognize exhaustion or sleep deprivation and treat them immediately. Operation of vehicles, machinery, or equipment should be avoided. A shift rotation of personnel will help eliminate fatigue factors.

- ***Body Mechanics:*** Proper body mechanics while working on floods is very important. The body is expected to work long, physical hours during the event. Each individual must make a conscious effort to use safe lifting and weight distribution techniques. Watch your footing; surfaces can be slippery and cluttered with tripping hazards.
- ***Construction Equipment:*** There are times when equipment and people will occupy the same work area. Workers should wear safety vests and hard hats and be aware of their surroundings. Safety warning devices (i.e. backup alarms and lights) should be in-tact and working on all equipment. Communication and alertness are vital! All operators must be certified for their equipment.
- ***Boat Travel:*** Materials and/or personnel will sometimes need to be transported to work sites by boat. Operators of the watercraft must be certified. Flotation devices must be available for every passenger. Extreme care should be taken while loading and off loading.
- ***Patrolling:*** Patrolling is the key to effective flood fighting. Patrols will identify, initiate control, and monitor trouble spots in affected areas. Vehicle patrols should travel in two person teams with dependable communication devices. Lifelines, flotation devices, and a blanket should be in the vehicle for possible water-related accidents. Foot patrols should also have the same considerations. Extreme caution should be exercised when travelling saturated, cracking, or sloughing areas.

- **Vehicle Placement:** Vehicles in work areas along the levee should remain parked on high ground. This is usually the crown roadway. Vehicles should also be parked facing their access point. An escape plan should be communicated to all flood workers.
- **Structure Considerations:** When working around structures, be aware of downed power lines, natural gas or propane leaks, and unstable structure supports. Communicate with the structure owner if possible.
- **Safety Gear:** Rain gear, warm clothing, handheld lights, gloves, goggles, hardhat, boots, first aid kit, ropes, personal flotation devices (PFD), hip waders.



Flood Fighting Terminology

| | |
|---------------------------|--|
| Boil | Also known as 'Sand Boil', is caused by water flowing through or under a levee, possibly carrying eroded levee material, and surfacing on the land side of the levee. |
| Button | A plastic tie down device used with plastic sheeting. |
| Emergency Spillway | Plastic sheeting and sandbags used to allow water to flow over a levee, protecting it from erosion. (Page 23) |
| Flood Fighting | An effort made to prevent or mitigate the effects of flood waters. |
| Home Protection | Plastic sheeting and sandbags placed around individual homes to protect from low current flood waters. (Page 26) |
| Lath | Long, narrow wooden stakes (4 feet long by 1 ½ inch wide) used to mark problem areas during high water patrolling. A brief description of the problem along with the date, time, and patroller's initials are written on the lath with a permanent ink marker. Brightly colored survey ribbon is attached to the lath for easy identification. |
| Levee | An earthen structure that parallels a river or stream designed to prevent high water flows from inundating urban and/or agricultural land. |

| | |
|--------------------------------|---|
| Levee Break | A point in the levee system that has failed to perform its designed function, has eroded away and is allowing water to inundate land. |
| Levee Breach | The same as Levee Break but can sometimes describe a section of levee that has been intentionally broken. If intentional, also known as a relief cut. |
| Lumber and Sack Topping | Wooden panels and sandbags used to prevent overtopping and to divert water, mud, and debris flows. (Page 11) |
| Overtopping | When water has risen higher than the banks of a waterway or the top of a levee. |
| Plastic Sheeting | Made of polyethylene, these 100'x20'x10 mil rolls are sometimes referred to as visquine and are used for erosion control. |
| Rain Coat | A single layer of plastic sheeting and sandbags used to protect slopes from further rain saturation. (Page 22) |
| Relief Cut | Intentionally-removed section of levee to relieve hydrologic pressure upstream and downstream of the levee section. |
| Sack Ring | Multiple sandbag rings used to encircle a boil, slow the flow of water, and stop the erosion of levee material. (Page 13) |
| Sack Topping | A sandbag wall designed to prevent overtopping. (Page 9) |

| | |
|-----------------------------|---|
| Sandbag | An 18"x30" bag (burlap or plastic) filled with sand or other appropriate material intended for use as a temporary flood fighting measure. |
| Sloughing | Soil movement or slides often caused by over-saturated levee or hillside slopes. Can also be referred to as 'mud slides'. |
| Structure Protection | Sandbags, wooden panels, or other materials used to divert water, mud, and debris flows away from buildings, homes, and other structures. (Page 24) |
| Temporary Levee | Use of plastic sheeting, fill material and sandbags to raise a low area on a levee or embankment. (Page 10) |
| Twine | 250lb tensile strength polypropylene tying twine. |
| 'U' Shaped Sack Ring | A sandbag structure used on levee slopes to control boils. (Page 14) |
| Wooden Panels | Wooden planks or plywood sheets used in conjunction with other flood fighting materials to prevent overtopping of levees or embankments and divert water. |
| Wavewash | Wind-generated waves breaking against a levee or embankment and possibly causing erosion. |
| Wavewash Protection | Plastic sheeting, sandbags, twine, stakes, and buttons used to prevent erosion of levee slopes and embankments. (Page 16) |

Reference Guide:

DWR Division of Flood Management
www.water.ca.gov/floodmgmt

California Data Exchange Center
 CDEC
www.cdec.water.ca.gov

California Emergency Management Agency
 California Office of Emergency Services
www.caloes.ca.gov

National Weather Service
www.weather.gov

To request a copy of the Directory of Flood Officials or
 Flood Emergency Phone Card, contact the DWR Flood
 Operations Center at (916) 574-2619

**Flood Fight Material/Equipment List**

Fill/Repair material (Sand, Rock, Road Base)
 Sandbags (18" width x 30" length 10 oz.)
 Plastic Sheetting (100'x20'x10 millimeter rolls)
 Wooden Stakes (1"x3"x24")
 Bailing Twine (250lb tensile strength)
 Tie Down Buttons
 Geotextile Fabric (20'x100' rolls)

Patrolling

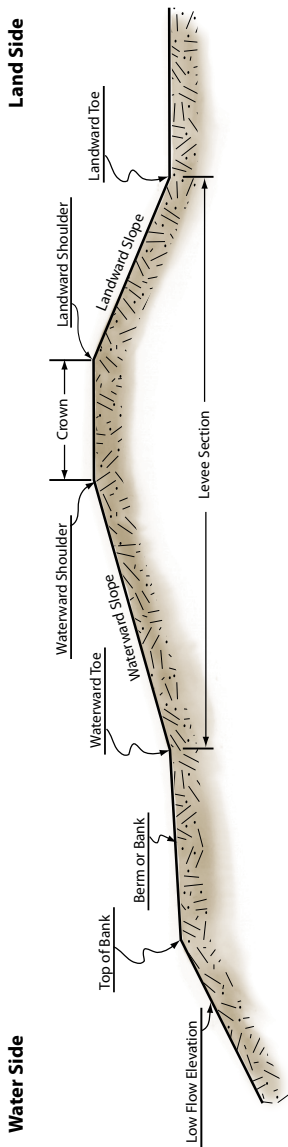
Patrol Vehicle (4Wheel Drive)
 Communication Devices (Radio, Cell Phone, Laptop Computer (e-mail)
 Global Positioning Satellite Handheld Device (GPS)
 Digital Camera
 Lighting (Flash Light, Flood Light)
 Batteries
 Lath (Bundle of 50)
 Survey Ribbon (Bright Colors)
 Permanent Ink Markers
 Patrol Log (Writing Pad and Pencil)
 Measuring Tape (100')

Tools

Shovels, Long Handle (#2 Mud Shovel)
 Sledge Hammer (10lb)
 Multi Purpose Lineman Pliers
 Pulaski
 McLeod
 Loppers

Safety

Rain Gear
 Rubber Boots
 Hard Hat
 Safety Glasses
 Gloves
 Boots
 Personal Flotation Device (PFD)
 Personal Safety Light
 Warm Clothing
 First Aid Kit



Levee Cross Section

State of California
Department of Water Resources
Division of Flood Management
Flood Operations Branch



For all flood training information, emergencies, questions, or for additional information, please contact :

State-Federal Flood Operations Center
(916) 574-2619
flood_center@water.ca.gov

For training information, contact:

Rick Burnett
Flood Fight Specialist
(916) 574-1203
rburnett@water.ca.gov



Levee Threat Monitoring Guidelines



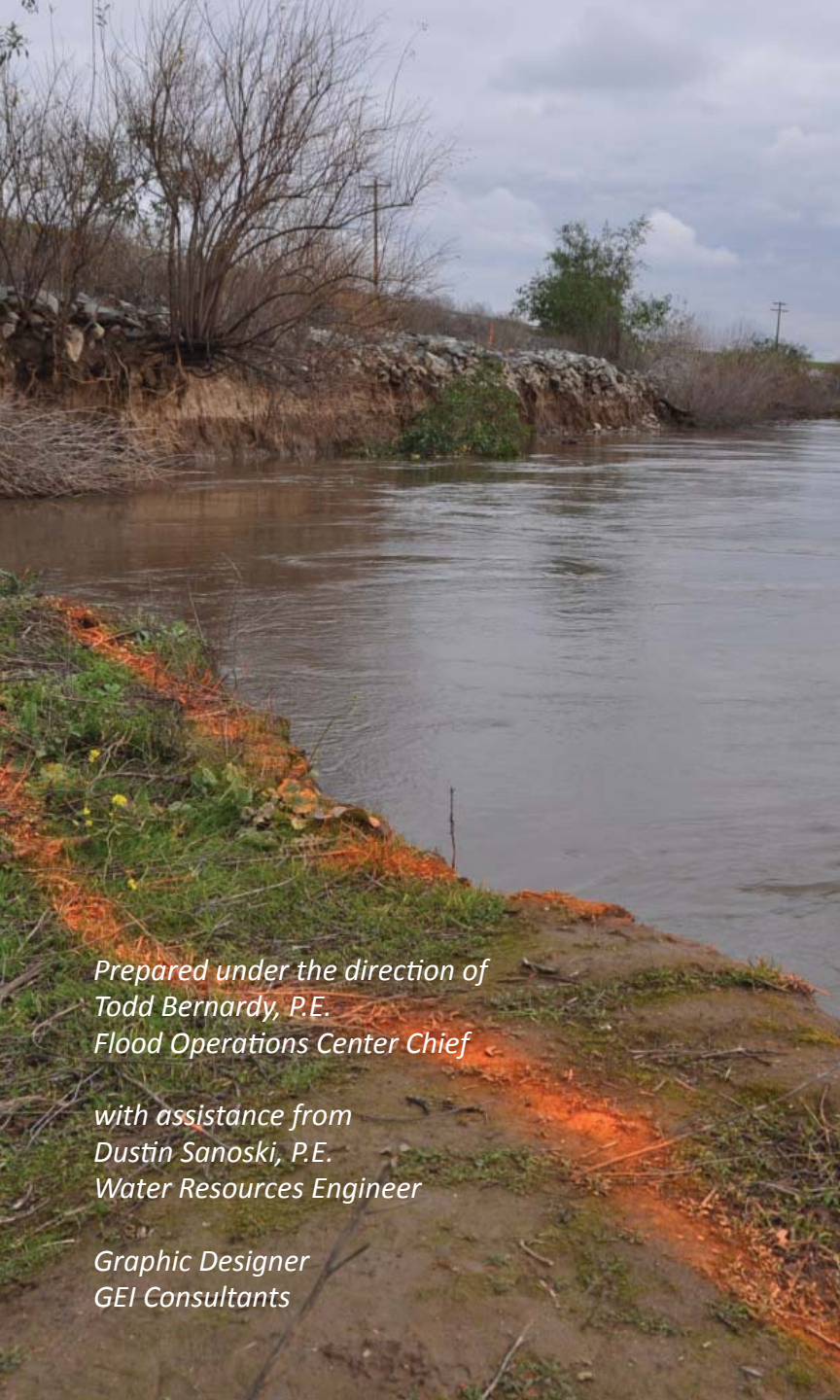
State of California
Department of Water Resources
2012 Edition

Levee Threat Monitoring Guidelines

State of California
California Natural Resources Agency
Department of Water Resources



Division of Flood Management
Flood Operations Branch
April 2012



*Prepared under the direction of
Todd Bernardy, P.E.
Flood Operations Center Chief*

*with assistance from
Dustin Sanoski, P.E.
Water Resources Engineer*

*Graphic Designer
GEI Consultants*

TABLE OF CONTENTS

| | |
|------------------------------------|----|
| Introduction | 2 |
| Levee and Embankment Threats | 3 |
| Patrolling | 3 |
| Terminology | 4 |
| Material Supplies Checklist | 6 |
| Gear Checklist..... | 6 |
| Lath Labeling Example..... | 7 |
| Field Safety Measures | 8 |
| Preparedness..... | 11 |
| Seepage..... | 12 |
| Boil | 14 |
| Sink Hole..... | 16 |
| Cracking | 18 |
| Slope Instability | 20 |
| Wave Wash | 24 |
| Erosion | 26 |
| Special Thanks..... | 29 |
| Reference Guide | 30 |
| Levee Cross Section | 31 |



Introduction

The purpose of the Levee Threat Monitoring Guidelines is to establish a set of “Best Practices” based on field-tested techniques used by levee maintaining agencies, their engineers, flood fight specialists, and levee inspectors to mark and monitor a levee threat.

These guidelines seek to “standardize” levee threat monitoring techniques and are NOT to be taken as requirements. This standardization will help ensure the threat is properly communicated to the appropriate groups, such as emergency responders and the Flood Operations Center. Particularly when there are multiple threats during a high water event, the ability to communicate effectively becomes especially important when the number of potential threats exceeds the available (limited) resources to respond, and a priority must be placed on which threat to mitigate first.

The Levee Threat Monitoring Guidelines presented in this field book were developed by the Department of Water Resources (DWR) Division of Flood Management in cooperation with the local maintaining agencies, experienced consultant engineers, and DWR maintenance yards.

Levee and Embankment Threats

The main causes of levee failure or flood related problems due to high water are:

- **Seepage** of water carrying material through or under the levee heavy enough to cause a “boil”.
- **Erosion** of the levee or embankment due to swift moving water or wave action.
- **Overtopping** resulting from water-surface elevations higher than the levee or embankment.

Patrolling

The best defense against flood related issues or levee failure is to identify problems early and repair them immediately. Levee inspections and effective high water patrolling make this possible. The following suggestions will help in organizing patrol teams for this work:

- Operate under the SEMS/ICS system and report to the appropriate section chief.
- Provide a sufficient number of workers for two 12-hour shifts.
- Provide each worker with a copy of the DWR “Flood Fighting Methods” handbook.
- Assign two people to each mobile patrol.
- Advise the officials of the district or agency responsible for emergency assistance in the area, and if necessary request the help from their Operational Area.

Terminology

| | |
|----------------|---|
| Boil | Also known as “sand boil”, is caused by water flowing through or under a levee, possibly carrying eroded levee material, and surfacing on the land side of the levee. |
| Cracking | Fracture on the top or slope of a levee caused by displacement of the embankment material. Excessive cracking can lead to slipping/sliding (clay soils) or sloughing (silty or sandy soils). |
| Erosion | Removal of levee material from the toe or slope of the levee due to swift moving water or wave action possibly resulting in bank caving, section loss, or levee break. |
| Flood Fighting | An effort made to prevent or mitigate the effects of flood waters. |
| Hub | A wooden stake (1-1/2"x1-1/2"x8") that is pounded into the ground as a place-holder (optional) for lath with only a few inches exposed and sprayed at the top with high visibility marking paint. |
| Lath | Long, narrow wooden stakes (1/4"x1-1/2"x33") used to mark problem areas during high water patrolling. A brief description of the problem along with the date, time, and patroller's initials are written on the lath with a permanent ink marker. Brightly colored survey ribbon is attached to the lath for easy identification. |
| Levee | An earthen structure that parallels a river or stream designed to prevent high water flows from inundating urban and/or agricultural land. |
| Levee Break | A point in the levee system that has failed to perform its designed function, has eroded away and is allowing water to inundate land. |

| | |
|----------------------|---|
| Levee Breach | The same as “Levee Break” but can sometimes describe a section of levee that has been intentionally broken. If intentional, also known as a relief cut. |
| Overtopping | When water has risen higher than the banks of a waterway or the top of a levee. |
| Plastic Sheetting | Made of polyethylene; these 100'x20'x10-mil rolls are sometimes referred to as visquine and are commonly used for erosion control. |
| Relief Cut | Intentionally removed section of levee to relieve hydrologic pressure upstream and downstream of the levee section. |
| Sack Ring | Multiple sandbags used to encircle a boil, slow the flow of water, and stop the erosion of levee material. |
| Sandbag | An 18"x30" bag (burlap or plastic) filled with sand or other appropriate material intended for use as a temporary flood fighting measure. |
| Scarp | A steep slope or long cliff that occurs from erosion or faulting and separates two relatively level areas of differing elevations. |
| Seepage | Water traveling under or through a levee in the void spaces of the soil. |
| Slope Instability | Soil movement or slip/slides often caused by over-saturated levee slopes or hillside slopes. Can also be referred to as “sloughing” or “mud slides”. |
| “U” Shaped Sack Ring | A sandbag structure used on levee slopes to control boils. |

Material Supplies Checklist:

- ☐ Lath (1/4"x1-1/2"x33")(25)
- ☐ Stakes (3/4"x1-1/2"x17")(25)
- ☐ Hubs (1-1/2"x1-1/2"x8")(10)
- ☐ 6' Rebar w/ Plastic Caps (2 No. 4 Rebar)
- ☐ Tie Wire
- ☐ Survey Ribbon (Bright Colors, Multiple Rolls)
- ☐ Sandbags (approximately 50 empty)
- ☐ Plastic Sheeting (Visquine) (1 roll)
- ☐ Box Twine (250lb tensile strength)
- ☐ Tie Down Buttons (approximately 100)
- ☐ Barricade or Safety Cones (Fluorescent Orange)
- ☐ Permanent Ink Markers
- ☐ High Visibility Marking Paint (17.0 oz)

Gear Checklist:

- ☐ First Aid Kit
- ☐ Personal Flotation Device
- ☐ Throw Rope
- ☐ Directory of Flood Officials & Flood Emergency Phone Card
- ☐ Log Book
- ☐ GPS
- ☐ Phone or Radio
- ☐ Rain Gear
- ☐ Boots or Rubber Boots
- ☐ Hard Hat
- ☐ Safety Glasses or Goggles
- ☐ Gloves
- ☐ Hip Waders
- ☐ Spot Light
- ☐ Pliers
- ☐ Tape Measure (100')
- ☐ Bolt Cutter
- ☐ Tow Chain
- ☐ Chain Saw or Axe
- ☐ Flashlight w/ Batteries
- ☐ Shovels, Long Handle (#2 Mud Shovel)
- ☐ Sledge Hammer (5 or 8 lb)
- ☐ Camera

Lath Labeling Example

High Visibility Marking Paint
(top 6" minimum)



Survey Ribbon – use
bright colors and double-up for
extra visibility and redundancy
(Tie it, wrap it around, and tie it again)



Provide Date and Time (24-hr) as
reference for determining rates (i.e. rate
of decay, flow rate, etc.)



Provide Initials to reference patroller



Threat being monitored



Pertinent information being
used to describe threat (i.e. flow rate,
offset distance, horizontal/vertical
displacement, etc.)



Date
Time
Initials
BOIL
1 cup/min

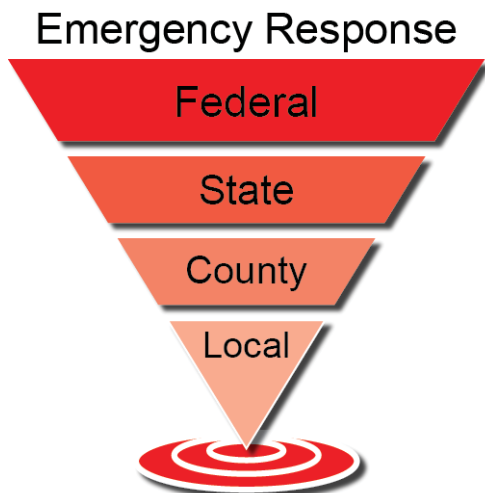
Field Safety Measures

- **Check Weather Patterns:** Always know weather forecasts and how it affects the vulnerable areas.
- **Changing Water Patterns:** The rise and fall of water can occur gradually or very quickly. Knowledge of high water and how it relates to your sites/levees is essential. Continuous monitoring and communication of water level influences, (i.e. reservoir releases, tides, and drainage inflow) is very important. Always know your area and its flood history.
- **Swift Water:** High velocities of water are common during high water events. Extreme caution should be used when anyone is exposed to high water. Workers must have personal flotation devices, throw ropes, and lifelines in the immediate area. Each staking crew must be composed of at least two individuals when staking swift water areas. Use common sense and sound judgment around swift water. Know your resources and how to activate them prior to the event. Swift water rescue teams may be available.
- **Temperature Related Illness:** Weather patterns can change constantly. Changes in temperature present the potential for hypothermia and heat exhaustion/stroke. Levee monitors should know the signs of distress for these types of illnesses and how to treat them. During cold, wet weather, it is recommended that workers layer clothing to stay warm and dry. A dry blanket and warm clear fluids should be on the work site for emergency use. In warm/hot weather lightweight clothing is recommended. If skin is exposed, a sun block agent may need to be applied. Plenty of drinking water should be on site and consumed regularly. Headgear is recommended in both hot and cold situations.
- **Insect/Animal Exposure:** Flooded areas force a variety of animals to evacuate to high ground. Workers in these areas should be aware of these animals and not handle them. If animal removal is needed, contact a local professional. Stinging and biting insects are prominent in certain flood-prone areas. Chemical repellents can be useful as a deterrent. A complete first aid kit should be on site.

- **Vegetation:** Noxious plants such as star thistle, stinging nettle, and poison oak are commonly found along rivers, streams, and levees. Avoid direct contact with this type of vegetation to prevent itching and rash. Consult medical personnel if symptoms persist. Individuals with history of allergic reaction should consider carrying an EpiPen.
- **Contamination:** Flooded areas can potentially carry high levels of contaminants. Common contaminants include fuel, sewage, and pesticides. Local Haz-Mat teams should be contacted if needed. Always wear protective clothing to help limit contact with water. Carry antibacterial hand soap and wash thoroughly after working around flood water.
- **Construction Equipment:** There are times when equipment and people will occupy the same work area. Workers should wear safety vests and hard hats and be aware of their surroundings. Safety warning devices (i.e. backup alarms and lights) should be intact and working on all equipment. Keep a battery-operated flashlight and radio on hand. Communication and alertness are vital! All operators must be certified for their equipment.
- **Boat Travel:** Materials and/or personnel will sometimes need to be transported to work sites by boat. Operators of the watercraft must be certified. Personal flotation devices must be available for every passenger. Extreme care should be taken while loading and off loading.
- **Patrolling:** Patrols will identify, mark, and monitor trouble spots in affected areas. Vehicle patrols should travel in two person teams with dependable communication devices. Lifelines, personal flotation devices, and a blanket should be in the vehicle for possible water-related accidents. Foot patrols should also have the same considerations. Extreme caution should be exercised when travelling saturated, cracked, or sloughing areas. Learn first-aid and have a first-aid kit with you at all times. Never turn your back on the water - work facing the water whenever possible or have a spotter monitor it for you if necessary. Do not take actions that would put an individual in harm's way.

- **Structure Considerations:** When working around structures be aware of downed power lines, natural gas or propane leaks, and unstable structure supports. Communicate with the structure owner if possible.
- **Vehicle Considerations:** Vehicles along the levee should remain parked on high ground; this is usually the crown of the roadway. Vehicles should also be parked facing their access point to allow for a quick exit (if possible). An escape plan should be communicated to all flood workers prior to heading out into the field. Do not drive through floodwaters during high water events. Remember, two feet or less of water can cause a car to be swept away.





Every emergency begins at the local level. Be prepared and have an emergency action plan!

- Patrol plan & schedule
- Emergency contacts & calling tree
- Emergency response protocols for monitor, flood, danger stage, and incident
- Location and quantities of flood fight materials
- Location and type of equipment available
- Evacuation plan and rally point
- List of critical sites that need extra attention
- Location & contact information for county Emergency Operations Center (EOC)

Share your emergency action plan with your local county Office of Emergency Services and DWR Flood Operations Center.

SEEPAGE

Considerations Around Seepage

1. Do not park directly above the area of seepage.
2. Do not tread unnecessarily near the area of seepage.
3. The sensitive zone may be saturated—do not walk directly from the road straight down to the area of seepage.
4. Confirm the seepage is NOT caused by an irrigation pipe.

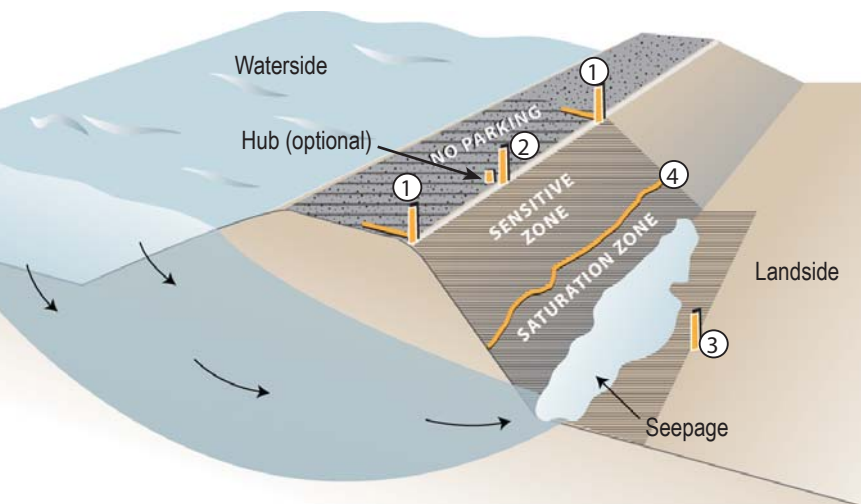
What to Measure and Record in Log Book

Monitor changes in the extent of seepage and transport of material.

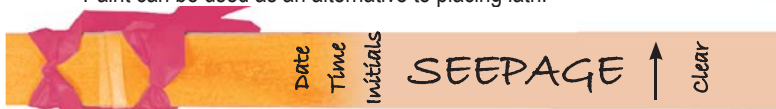
- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) – use lath ② for reference
- Description of threat:
 - » Offset distances from lath
 - » Approximate longitudinal length along levee
 - » Approximate pond width into field
 - » Material transport: flowing clear or carrying material
 - » Note if the water appears to be ponded or is flowing
 - » Extent of soil saturation up the levee toe
 - » Note signs of slope instability
 - » Approximate water surface elevation relative to crown
 - » Note forecast point staff gage reading
 - » Note past performance history of site
- Note surrounding ground conditions & signs of poor drainage
- Take photos or draw schematic for records



How to Mark Seepage



- ① Place one lath at the beginning of the ponding location and one at the end. Mark each lath with an arrow pointing inwards toward the location of ponding. Mark whether the water appears to be clear or carrying material. Add lath as the threat grows (do NOT remove old lath). Paint can be used as an alternative to placing lath.



- ② Mark the longitudinal length and width of the ponding along the levee. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.



- ③ Lath alternative: Place an additional lath in the landside field at the extent of ponding.



- ④ Saturation zone (if weather permits): Draw a line up and along the levee slope using high visibility marking paint to display the edge of the saturation zone. Paint date next to line.

****Replace lath if lost or stolen****

Considerations Around Boil

1. Do not park directly above the boil.
2. Do not tread unnecessarily near the boil.
3. The sensitive zone may be saturated—do not walk directly from the road straight down to the boil.
4. Confirm the boil is NOT caused by an irrigation pipe.

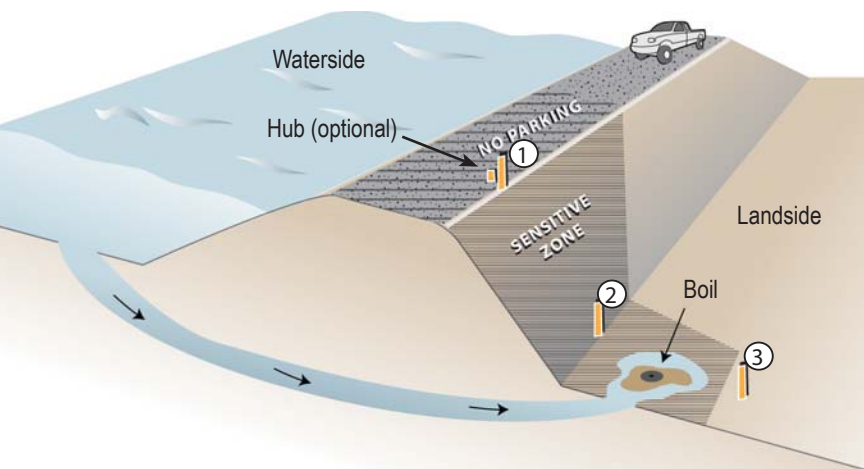
What to Measure and Record in Log Book

Monitor changes in water flow rate and transport of material.

- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) – use lath ① for reference
- Description of threat:
 - » Located on levee slope or ground adjacent to slope
 - » Offset distances from lath
 - » Distance from levee toe
 - » Diameter of boil(s) & total number of boils
 - » Material transport: water flowing clear or carrying material
 - » Approximate flow rate (i.e. 1 cup/min, 1 coffee can/min, 5-gallon bucket/min)
 - » Approximate water surface elevation relative to crown
 - » Note forecast point staff gage reading
 - » Note past performance history of site
- Note surrounding ground conditions & signs of poor drainage
- Take photos or draw schematic for records



How to Mark a Boil



- ① Mark the diameter of the boil and the approximate flow rate. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.



- ② Measured from the levee toe, mark the distance to the edge and to the center of the boil. Place this lath when boil is located far from toe.



- ③ Lath alternative: Place an additional lath in the landside field at a minimum distance of 10' from the boil edge to show extent of ponding.



Optional measure: If there is a question about source of boil, use environmentally safe dye in adjacent irrigation channels to confirm water flow is from river.

****Replace lath if lost or stolen****

SINK HOLE

Considerations Around Sink Hole

1. Do not park directly adjacent to sink hole.
2. Be cautious of collapse around sink hole.
3. Be cautious around toe of levee slope.
4. Confirm the sink hole is NOT caused by an irrigation pipe.

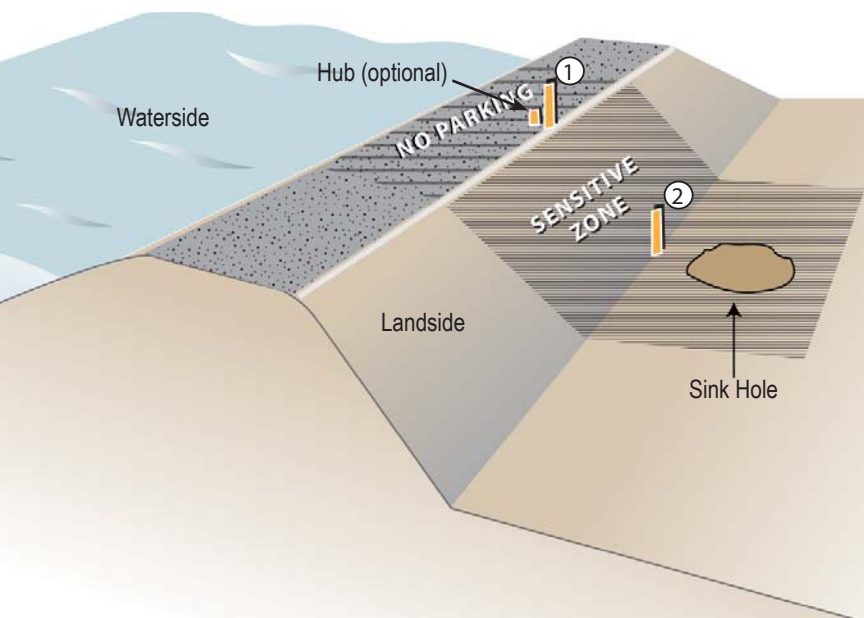
What to Measure and Record in Log Book

Monitor changes in diameter, depth of sink hole, and water level.

- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) – use lath ① for reference
- Description of threat:
 - » Location of threat (landside, waterside, crown, slope, toe)
 - » Offset distances from lath
 - » Diameter of sink hole
 - » Note if sink hole is dry or filled with water
 - » Use a lath to approximate the depth of water
 - » Note if pipes, risers, valves or other appurtenances are present.
 - » Approximate water surface elevation relative to crown
 - » Note forecast point staff gage reading
 - » Note past performance history of site
- Take photos or draw schematic for records



How to Mark Sink Hole



- ① Mark the diameter of the sink hole. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.



- ② Measured from the levee toe, mark the distance to the edge and to the center of the sink hole. Place this lath when sink hole is located far from toe.



****Replace lath if lost or stolen****

CRACKING

Considerations Around Cracking

1. Do not park directly on the cracks.
2. Place lath 1' offset from cracks (typical).

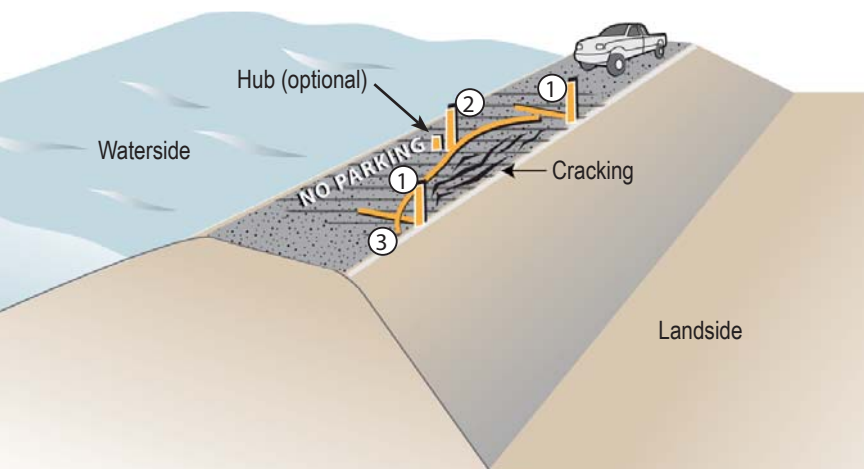
What to Measure and Record in Log Book

Monitor change in length, width, depth, and extent into crown.

- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) - use lath ② for reference
- Description of threat:
 - » Location of threat (landside, waterside, crown, slope)
 - » Offset distances from lath or paint
 - » Longitudinal length of cracking
 - » Width of cracking into crown
 - » Largest crack width
 - » Largest depth in crack
 - » Note bulging or instability on levee slope
 - » Approximate water surface elevation relative to crown
 - » Note forecast point staff gage reading
 - » Note past performance history of site
- Take photos or draw schematic for records



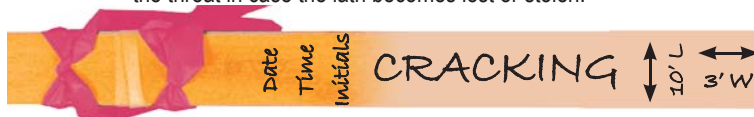
How to Mark Cracking



- ① Place one lath at the beginning of the cracking and one at the end. Mark each lath with an arrow pointing inwards toward the location of the threat. Mark the largest width and depth of cracking. Add lath as the threat grows (do NOT remove old lath). Paint can be used as an alternative to placing lath.



- ② Place one lath at the center location of cracking- beyond the area of cracking and adjacent to the affected area of the levee. Mark the longitudinal length of cracking; also mark the extent onto the crown if the cracking is occurring on the crown. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.



- ③ Paint alternative (if weather permits): Draw a line adjacent to the cracking using high visibility marking paint. This will aid in visually displaying the area of cracking. Paint date next to line. Use in addition to the placing and marking of lath.

****Replace lath if lost or stolen****

SLOPE INSTABILITY

Considerations Around Slope Instability

1. Do not park directly above unstable slope.
2. Barricade/cone the area if more than $\frac{1}{4}$ crown width (horizontally) or more than 2' of vertical displacement has occurred (severe case). Place lath 2' offset from threat (typical).
3. Tread lightly in sensitive zone to prevent causing additional levee damage or injury to individual.

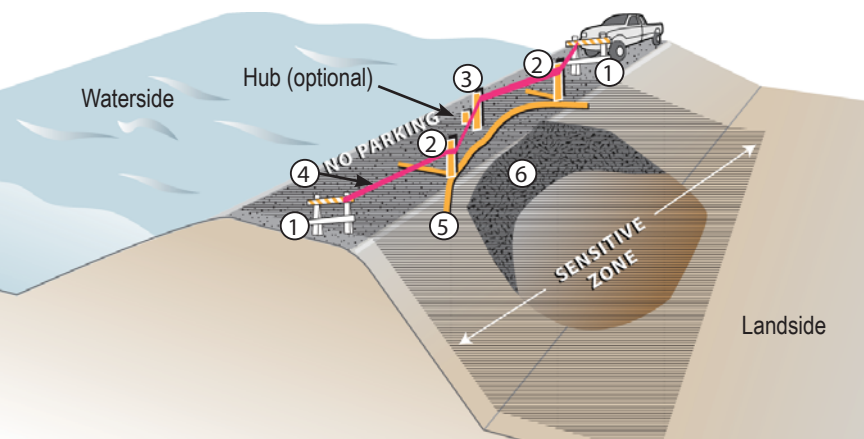
What to Measure and Record in Log Book

Monitor movement of levee slope and record changes in horizontal and vertical displacement.

- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) – use lath ③ for reference
- Description of threat:
 - » Location of threat (landside crown, slope, toe)
 - » Offset distances from lath
 - » Longitudinal length
 - » Extent into crown
 - » Vertical displacement
 - » Horizontal displacement
 - » Note any bulging on levee slope
 - » Approximate water surface elevation relative to crown
 - » Note forecast point staff gage reading
 - » Note past performance history of site
- Take photos or draw schematic for records



How to Mark Slope Instability



- ① Place barricade/cones 8' offset (minimum) from lath ②. Barricade/cones prevent vehicles from entering "danger zone" and are to be used in severe cases of horizontal and vertical displacement.
- ② Place one lath at the beginning of the slope instability (write "slip" on lath as a generic term to describe slope instability) and one at the end. Mark each lath with an arrow pointing inwards toward the location of the threat. Add lath as the threat grows (do NOT remove old lath). Paint can be used as alternative to placing lath.



- ③ Place a lath at the center location of slope instability. Mark the longitudinal length of the threat. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.



- ④ Ribbon connects the barricades to lath and encloses the "danger zone" from one side of the slope instability site to the other. Use bright colored ribbon to help make the site more visible.
- ⑤ Paint alternative (if weather permits): Draw a line adjacent to the edge of displacement using high visibility marking paint. This will aid in visually displaying the unstable site. Paint date next to line. Use in addition to the placing and marking of lath.
- ⑥ See page 22 for marking horizontal and vertical displacement.

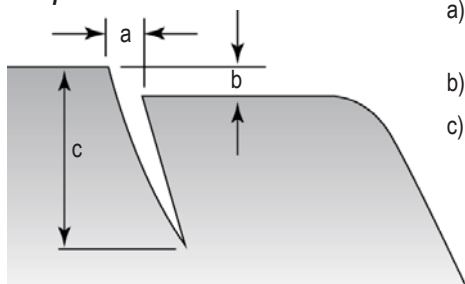
*****Replace lath if lost or stolen*****

SLOPE INSTABILITY

How to Monitor Horizontal & Vertical Displacement

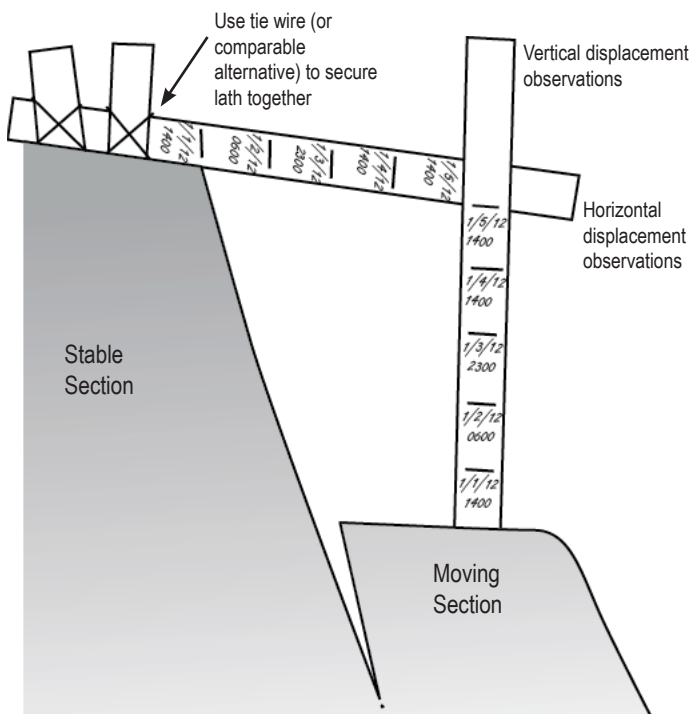
1. Pound two laths vertically into stable section at a 1' offset from the moving section, 6" deep minimum, and space them 6" apart.
2. Secure one lath horizontally to the two lath on the stable section (as shown on next page) using tie wire or a comparable alternative. Stabilize lath using ground surface.
3. Pound one lath vertically into moving section approximately 6" deep, and offset 6" from the stable section. Place lath so that it rests against horizontal lath.
4. Draw a line on the vertical lath at the bottom of where it intersects with the horizontal lath. [This identifies the "baseline" for where to begin measuring vertical displacement]. Mark the date and time below this line.
5. Draw a line on the horizontal lath at the bottom of where it intersects with the vertical lath. [This identifies the "baseline" for where to begin measuring horizontal displacement]. Mark the date and time below this line.
6. Come back (some time later) and mark on the horizontal lath where it intersects with the vertical lath, and mark on the vertical lath where it intersects with the horizontal lath. Repeat this step over time as slope continues to displace.
7. Rate of horizontal & vertical displacement is the distance measured between observations divided by time.

Early Stage Horizontal and Vertical Displacement



- a) Horizontal displacement
- b) Vertical displacement
- c) Crack depth

Late Stage Horizontal and Vertical Displacement



WAVE WASH

Considerations Around Wave Wash

1. Walk and drive carefully around areas subject to wave wash.
2. If wave wash results in erosion that encroaches into the levee prism it could lead to rapid levee failure.

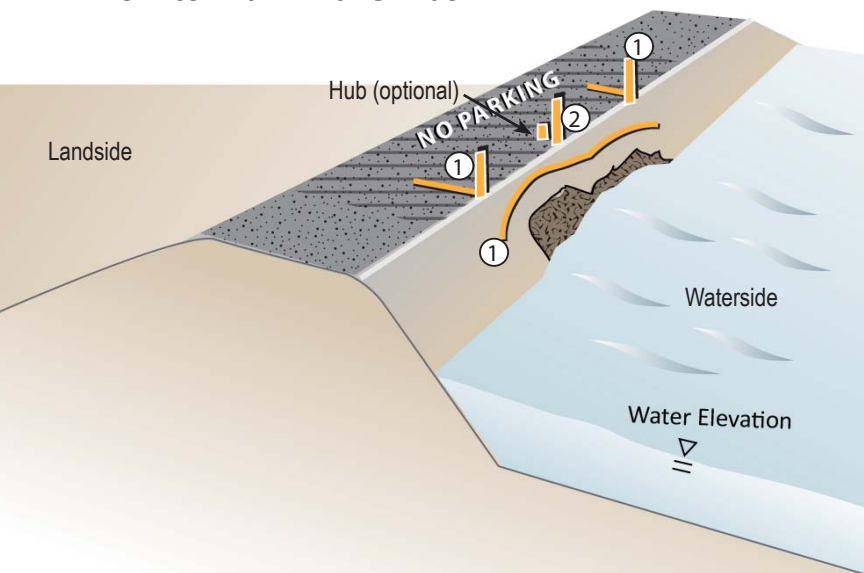
What to Measure and Record in Log Book

Monitor changes in length and expansion of erosion toward crown.

- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) – use lath ② for reference
- Description of threat:
 - » Distance down slope relative to crown
 - » Length and width(s) of erosion
 - » Height and depth of scarp
 - » Approximate water surface elevation relative to crown
 - » Note forecast point staff gage reading
 - » Note past performance history of site
- Take photos or draw schematic for records



How to Mark Wave Wash



- ① Place one lath at the beginning of the area experiencing wave wash and one at the end. Mark each lath with an arrow pointing inwards toward the location of the threat. Add lath as the threat grows (do NOT remove old lath). Paint can be used as an alternative to placing lath.



- ② Mark the longitudinal length and width of the wave wash extent. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.



****Replace lath if lost or stolen****

EROSION

Considerations Around Erosion

1. Walk and drive carefully around erosion site—loose soil could collapse and cause injury to person and/or vehicle.
2. If erosion encroaches into levee prism (see diagram) it could lead to rapid levee failure.
3. Be cautious near edge of erosion; eddy may have undermined bank integrity and may cave in unexpectedly.

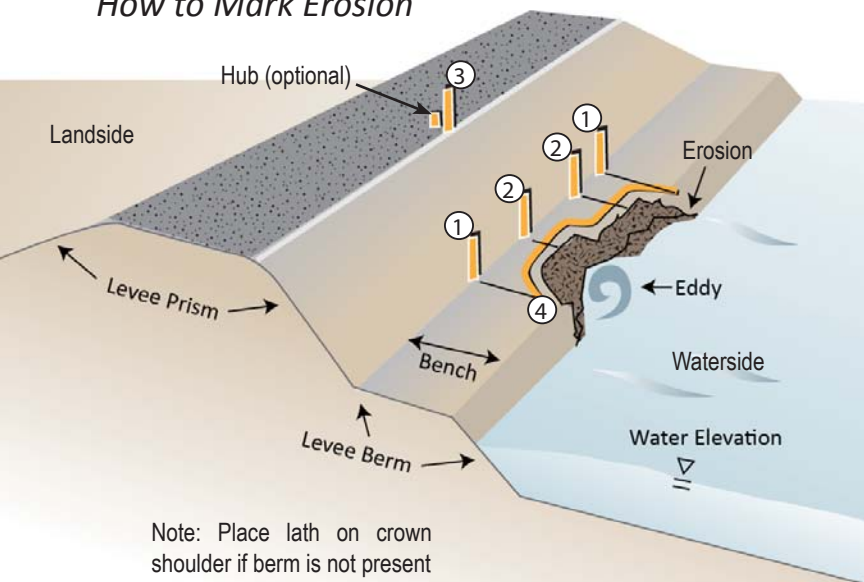
What to Measure and Record in Log Book

Monitor changes in length and expansion of erosion toward crown.

- Date, Time, Person's Name
- Location along levee (GPS coordinates, levee mile, or approximate description) – use lath ③ for reference
- Description of threat:
 - » Site relative to bend (straight, inside/outside)
 - » Offset distances from lath or paint
 - » Length and width(s) of erosion
 - » Height and depth of scarp
 - » Note if eddy has formed
 - » Approximate water surface elevation relative to crown
 - » Note forecast point staff gage reading
 - » Note past performance history of site
- Take photos or draw schematic for records



How to Mark Erosion



Note: Place lath on crown shoulder if berm is not present

- ① Mark offset distance from levee toe to edge of berm where no erosion has occurred – shows “normal” bench width and the extent of erosion. Place additional lath at levee toe as threat grows (do NOT remove old lath).



- ② Mark offset distance from levee toe to edge of erosion – shows depth of erosion into berm. Place lath at levee toe.



- ③ Place lath at levee crown shoulder and center it longitudinally across erosion site. Mark the longitudinal length of erosion. Place an optional hub at the base of the lath to identify the location of the threat in case the lath becomes lost or stolen.



- ④ Paint alternative (if weather permits): Draw a line adjacent to the erosion, and several more in 4' increments away from the erosion, using high visibility marking paint. This will aid in visually displaying the rate of the erosion over time. Paint date next to line. Use in addition to the placing and marking of lath.

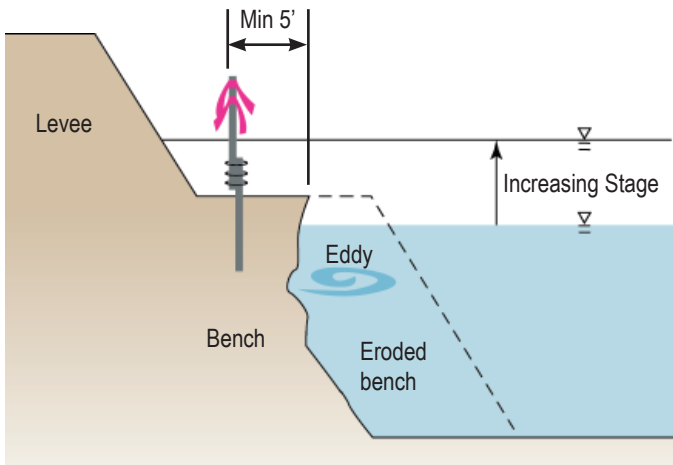
*****Replace lath if lost or stolen*****

EROSION

Monitor Erosion When Berm is Obscured

If there is concern that the erosion site may be obscured due to water surface/stage increase, the berm can be monitored by placement of rebar. If rebar is gone, there is high likelihood that the erosion has grown to rebar location. One technique to monitor erosion when berm is obscured by water surface is described below:

1. Drive No. 4 rebar 2'-3' into ground no closer than 5' from current erosion edge.
 - » Be aware of potential for undercutting by eddys.
 - » Note location of rebar relative to levee toe and erosion edge.
2. Attach second No. 4 rebar to first rebar using tie wire so that the combined height of the two rebar are at least 6' above bench surface.
3. Attach 2 survey ribbons at the top of the second rebar.
4. To help protect the monitoring rebar against debris floating downstream, place three rebar upstream of monitoring rebar in a diagonally staggered line so to best deflect debris.
5. Document rebar location and distance from rebar to edge of erosion in log book.
6. Take photos or draw schematic for records.



A Special Thank You to:

Flood Maintenance Office

Phil Carey
Russ Eckman
Mark List
Eric McGrath
Brian Murphy
Ran Singh
Jeff Van Gilder

Flood Operations Branch

Rick Burnett
Patricia Clark
Nova Clemenza
William Croyle
Sean de Guzman
Greg Harvey
John Paasch
Wendy Stewart
Ally Wu

Flood Project Integrity & Inspection Branch

Amy Bindra
Tariq Chechi
David Chen
Bob Duffey
Jim Eto
Tasmin Eusuff
Pavel Kazi
Jaime Matteoli
David Pesavento
Herman Phillips
Clay Thomas
John Williamson

Flood Risk Assessment and Mitigation Office

Vincent Rodriguez

National Weather Service

Cindy Matthews

Reclamation District 900

Tony Schwall

San Joaquin County

Eric Ambriz
John Nelson

Reference Guide:

DWR Division of Flood Management:

www.water.ca.gov/floodmgmt

California Data Exchange Center (CDEC)

<http://cdec.water.ca.gov>

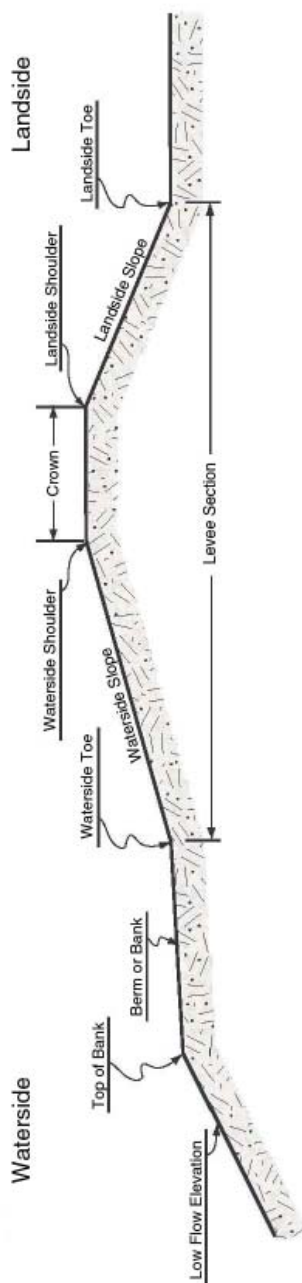
California Emergency Management Agency (CalEMA)

www.calema.ca.gov

National Weather Service

www.weather.gov

To request a copy of the Directory of Flood Officials or Flood Emergency Phone Card, contact the DWR Flood Operations Center at (916) 574-2619.



Levee Cross Section

State of California
Department of Water Resources
Division of Flood Management
Flood Operations Branch

FLOOD

EMERGENCY RESPONSE



For all flood emergencies, questions, or
for additional information, please contact:

State-Federal Flood Operations Center

(916) 574-2619

(800) 952-5530

flood_center@water.ca.gov



version 1.1

