

SAN LUIS OBISPO COUNTY
DAM and LEVEE FAILURE EVACUATION PLAN
EMERGENCY RESPONSE PLAN

STANDARD OPERATING PROCEDURE

FOR

**SAN LUIS OBISPO COUNTY
PUBLIC WORKS DEPARTMENT**

**ARROYO GRANDE CREEK LEVEE FAILURE
EMERGENCY RESPONSE PLAN**

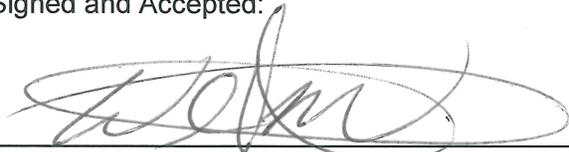
(AGCLFERP)

Revised
March 2016

AUTHENTICATION

This Standard Operating Procedure has been approved and is hereby incorporated as a department/agency/jurisdiction procedure.

Signed and Accepted:



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01 MARCH 2016

Date

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Date

PREFACE

This SOP is a component of the San Luis Obispo County Dam and Levee Failure Evacuation Plan. Detailed preparedness measures and emergency procedures concerning the operation of the Arroyo Grande Creek Levees by the Public Works Department are included herein. The San Luis Obispo County Dam and Levee Failure Evacuation Plan describes the overall County emergency organization and response, including Implementing Instructions to be used by the County Emergency Services Director (ESD) and other key officials at the County Public Works Department Operations Center (PWDOC) and the County Emergency Operations Center (EOC), in directing the emergency response activities.

REVISIONS

DESCRIPTION	DATE
Original Document	12/2008
Complete Revision	3/2009
Revision Defined staff assignments; updated Section 7.2 and Checklists #1, #2 and #3; revised Checklists #4, #5, and #6; updated figures and maps to reflect current conditions; and added Appendix 4: Anticipated Rates of Increase in Water Surface Elevation.	1/2012
Revision	
Revised all checklists to reflect actual response actions; divided checklists by position; updated figures and maps to reflect current conditions; updated emergency contact information; added Appendix 3: Radio Procedures and Call List; added Appendix 6: Personal Safety Plan.	3/2016

DISTRIBUTION

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Sanitized Version	1	SLO County Library (CD)	
	1	Arroyo Grande Library (CD)	
	1	Oceano Library (CD)	
Dept./Agency	1	Public Works, Director	
	1	Public Works, Utilities Div. Manager	
	2	Public Works DOC	
	2	Public Works, UDOC	
	1	Lopez Water Treatment Plant	
	1	Public Works Section 3 Yard	
	1	Public Works Transportation Division Manager	
	1	Public Works, Road Maintenance Manager	
	1	Sheriff's Dept	
	1	Cal Fire	
	1	Five Cities Fire Authority	
	1	CHP	
	1	County OES	
	1	Public Health Emergency Planning (PHEP)	
	1	PH Environmental Health	
	1	American Red Cross	
	1	City of Arroyo Grande	
	1	Oceano CSD	
	1	South County Sanitation District	

DUPLICATION QUANTITY [28]

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PART ONE – OVERVIEW

1. INTRODUCTION

1.1 PURPOSE

The primary purpose of this Standard Operating Procedure (SOP) is to establish and define the specific procedures to be followed by the Department of Public Works during a flood emergency involving the Arroyo Grande Creek Levees.

These procedures establish guidelines for response actions in support of the County's organizational response for overall coordination of public protective actions that may be needed in the event of a levee failure or other flood emergency. The County's organizational response is described in the San Luis Obispo County Dam and Levee Failure Evacuation Plan.

1.2 OBJECTIVES

The objectives of this plan are:

- Provide a background of the threat posed by the Arroyo Grande Creek Levees
- Provide procedures for operation and maintenance of Arroyo Grande Creek Levees and facilities during periods of potential flood emergency.
- Provide guidelines that Public Works may use to predict a levee failure or rising flood waters
- Define initial emergency responses to a potential or actual levee failure or high water elevation alarm received from the Meadow Creek Lagoon area.
- Establish guidelines under which Public Works can operate upon determination of a potential or actual failure of the levees or high water elevation alarm around the Meadow Creek Lagoon Area.

2. BACKGROUND

The Arroyo Grande Flood Control Project was constructed in 1961 to convey the design capacity of 7,500 cubic feet per second (cfs) with 2 feet of freeboard, estimated to provide flood protection from a storm with over a 50 year recurrence interval.

Due to challenges in maintaining the channel, such as inadequate funding and regulatory requirements, the channel has lost significant capacity since it was originally constructed. Although the maintenance efforts are improving since assessments were approved in July 2006 to pay for maintenance on the channel, the existing capacity of the channel is estimated to be approximately 2,500 cfs, a reduction in capacity of over 75%. Additionally, significant development has occurred within the watershed since 1961, which has increased storm runoff volume and thereby reduced the recurrence interval for when the channel capacity is exceeded. It is estimated that the channels can

provide flood protection from a storm with only a 4.6 year recurrence interval. This means that the channel has the probability to overtop once every 4.6 years¹.

The existing flood risk is compounded in years when Lopez Dam/Reservoir is at or near capacity. Historical records show that Lopez Dam has spilled up to 2,000 cfs, which is approximately the existing capacity of the channel. If Lopez Dam is spilling during a storm event, it is unlikely that the Arroyo Grande Creek Levees would contain the creek flows.

The local threat of flood related damage due to a channel overtopping or levee failure is primarily confined to low-lying areas in the flood plain that are immediately adjacent to the Arroyo Grande Creek levees. The effects of a flood can range from insignificant damage to heavy damage with fatalities. The northern levee protects several residential developments, as well as the regional wastewater treatment plant that services the communities of Arroyo Grande, Oceano, and Grover Beach and the Oceano Airport. If the north levee is overtopped or breached, risk to human life will be a threat. The southern levee protects hundreds of acres of farmland and several residences. North levee elevations are slightly higher, by design, to protect residential areas and direct initial overtopping to the south. The levee system and surrounding area is shown on Figure 1.

The neighborhoods surrounding the Oceano Lagoon within the flood plain are subject to flooding by not only high flows in Arroyo Grande Creek, but also by drainage from the Meadow Creek watershed. The Meadow Creek watershed flows to the ocean at two locations. The first and primary location influencing floodwaters in Oceano is at the flap gates on the north Arroyo Grande Creek levee. The second location is at the Carpenter Creek outlet, located on State Park property at their North Campground (just north of the Pismo Beach State golf course). Flooding around the Oceano Lagoon has several causes, including high flow in Arroyo Grande Creek, high tide, or high beach profile (i.e. sandbar), all of which contribute to higher water surface elevations of Arroyo Grande Lagoon and results in restricting drainage out of the Oceano Lagoon through the flap gates. Continual monitoring of these conditions is necessary in order to implement flood mitigation response actions including early warning to residents of potential flood hazard to ensure their safety.

In order to alleviate the existing flood risk, Public Works will activate this plan when there is a forecast for significant rainfall or when the water surface in the impacted water bodies (Arroyo Grande Creek and Oceano Lagoon) reaches pre-determined threshold levels.

3. SCOPE

This SOP is to be used in conjunction with the Department's Procedural Memorandum AD-18 - Storm Emergency Operations (Appendix 1).

¹ Arroyo Grande Creek Erosion, Sedimentation and Flooding Alternatives Study, Swanson Hydrology & Geomorphology, January 4, 2006.

4. RESPONSIBILITIES

Declaration of a storm event and/or storm emergency conditions will be in accordance with AD-18 (Storm Emergency Operations). In case of emergency, please refer to the emergency call list for the Department of Public Works (Appendix 2).

The Utilities Division Manager, or his designee, will ascertain when these conditions are likely to occur by monitoring National Oceanic and Atmospheric Administration (NOAA) and local weather forecasts during storm periods. The Utilities Division Manager or his designee will also monitor creek flows for potential levee damage/overtopping and execute all necessary emergency response actions per this SOP. The Utilities Division Manager will be assisted in the monitoring by a team consisting of two (2) office staff monitoring rainfall and stream gauges and three (3) patrol squads staffed with Utilities South County Operations, Utilities Office and Road Maintenance personnel.

When it is evident that a levee failure or flood emergency is imminent, the Utilities Division Manager will notify, per this SOP, appropriate emergency officials and request implementation of the San Luis Obispo County Dam and Levee Failure Evacuation Plan for the Arroyo Grande Creek Levees.

The Utilities South County Operations, Utilities Office, and Road Maintenance personnel will be responsible for performing facility inspections, and any feasible operation and maintenance.

The Public Works Director will request assistance / mutual aid from County OES should existing manpower, equipment, and or funds will be exhausted.

The Roads Maintenance Manager will assist the Utilities Division Manager with emergency response actions defined in this plan such as implementation of repairs and/or implementation of a manual breach of the south levee. Assistance may be to provide available resources including personnel and equipment.

The County Office of Emergency Services (OES), Cal Fire, and Sheriff, will assist in implementing the County's overall organizational response for overall coordination of public protective public actions that may be needed in the event of a levee failure or other flood emergency.

Refer to the Emergency Response Organization Chart (Figure 2) for a list of members of the County emergency organization.

5. CONCEPT OF OPERATIONS

Procedures for operation and maintenance of Arroyo Grande Creek Levees and facilities during periods of expected flood emergency were developed for three storm stages:

1. Pre-storm flow
2. Full-storm flow
3. Post-storm flow

Checklists were developed for each Public Works' staff member of the emergency organization and includes initial response guidance for each storm stage. Checklists are included in Part 2 of this document.

6. COMMUNICATIONS

A staff member from the Utilities Division is assigned the role of "Weather Watcher". The purpose of the Weather Watcher is to notify staff of significant rain forecasts and to alert staff of potential flash flood warnings. The Weather Watcher will notify all staff when the following conditions occur:

- Precipitation forecasts of more than ½ inch, with daily updates during rain events
- Flash Flood Warning issued by NOAA in San Luis Obispo County

Additionally, alert alarms from existing stream gauges at Valley Road and 22nd Street Bridges will notify key personnel of when high flows are occurring in Arroyo Grande Creek Channel and/or Los Berros Diversion Channel. During periods when emergency storm conditions have been declared, the Utilities Division Manager or his designee will report to the UDOC.

The Utilities Division Manager, or his designee, will monitor Arroyo Grande Creek, Los Berros Diversion Channel, and Meadow Creek flows for potential flooding and execute all necessary emergency response actions per this Plan. The Utilities Division Manager will be assisted in the monitoring by a team consisting of one office staff monitoring rainfall and stream gauges, a second office staff coordinating administrative issues, and three (3) patrol squads staffed with South County Operations, Utilities Division, and Roads Maintenance personnel. The office staff monitoring rainfall and stream gauges and coordinating the administrative issues will be stationed in the UDOC with the Utilities Division Manager and will have access to a computer and the internet. The patrol squads will be located on-site at Arroyo Grande Creek Levees in 4-wheel drive vehicles, and will primarily use cell phones to communicate with the Utilities Division Manager/UDOC. In addition, two-way radios equipped in patrol vehicle may be used to communicate with the Utilities Division Manager/UDOC or other patrols.

- **UDOC**
- **Patrol squad staff phone numbers are included in Appendix 1.**
- **Emergency call lists are included in Appendix 2.**
- **Radio operation, channel, and call information is included in Appendix 3.**

The Utilities Division Manager will keep the Public Works Director informed of the channel conditions and provide frequent situation updates. The Utilities Division Manager will also communicate with members of the County's emergency organization, as required and defined in this Plan.

7. EMERGENCY FACILITIES AND EQUIPMENT

7.1 FACILITIES

If the Full-Storm flow stage is occurring and there is a potential flood emergency, the DOC will be opened and located at the County Government Center (Old

Courthouse), Room 207. A separate station for the UDOC with a computer and internet access will be set up for the Utilities Division Manager and Utilities Division staff assigned to monitor rain/stream gauges.

7.2 EQUIPMENT AND SUPPLIES

Materials and equipment that are necessary to perform operation and maintenance on the channel system during a flood emergency may be obtained from the Section 3 yard located at Kansas Ave. In addition, there are several contractors available to assist with rented operated equipment. A list of available equipment and contractors is located in Appendix 5.

8. EMERGENCY WORKER SAFETY

All field personnel are to exercise extreme caution when working in the vicinity of the flood control channel and levee system during a storm event and are to avoid any situation which may place county personnel and/or equipment in danger. All field personnel should follow guidelines in the personal safety plan for Arroyo Grande Creek Levees included in Appendix 6.

Personnel performing inspections on the levee tops during storm events should only drive on the levee tops if they are in a 4-wheel drive vehicle equipped with 2-way radio and conditions are safe.

9. REQUESTS FOR FLOOD AND OTHER EMERGENCY ASSISTANCE

The Public Works Director will request mutual aid and other assistance through the County OES. Requests for assistance or resources shall be made prior to completely exhausting available resources (manpower, equipment or funds, etc.).

When it is evident that local agency manpower, equipment and/or funds will be exhausted and other local resources are insufficient to cope with the situation, then assistance may be requested from the State Department of Water Resources per AD-18.

If it appears that the particular flood situation cannot be controlled with either local or state resources, then DWR will request federal assistance. The director of DWR will coordinate the activation of Public Law 84-99 for emergency assistance from the U.S. Army Corps of Engineers.

10. TRAINING

Training will be conducted annually or whenever procedures are revised. Applicable agencies will be included in training.

11. PROCEDURE MAINTENANCE

This procedure will be maintained by the Utilities Division Manager or designee(s). SOP will be reviewed annually and after any flood emergency to evaluate SOP effectiveness. Lessons learned during a flood emergency will be documented and incorporated into the SOP.

PART TWO - CHECKLISTS

- Checklist 1: Weather Watcher Initial Response
- Checklist 2: UDOC Response
- Checklist 3: Utilities Division Manager Response
- Checklist 4: Public Works Director Response
- Checklist 5: Patrol – Pre-Storm Flow Inspection
- Checklist 6: Patrol – Full Storm Flow Inspection
- Checklist 7: Patrol – Post Storm Flow Inspection
- Checklist 8: Road Maintenance Manager – Manual Levee Breach Actions
- Checklist 9: Breach Operator – Implementation of Manual Breach

CHECKLIST 1: WEATHER WATCHER INITIAL RESPONSE

PURPOSE: The purpose of this checklist is to provide a list of steps to assist the **Public Works Weather Watcher** in determining the storm flow stage and making required notifications.

Directions to determine the storm flow stage for Arroyo Grande Creek are included at the end of this checklist.

___ Monitor NOAA and local weather forecasts during storm periods (October to April)

1. INITIAL NOTIFICATIONS

___ 1.1 Notify Utilities Division Manager of significant rain forecasts, when the following conditions occur:

- Precipitation forecasts of more than ½ inch, with daily updates during rain events
- Flash Flood Warning issued by NOAA in San Luis Obispo County

___ 1.2 Notify Utilities Division Manager and all Utilities Division Staff when the Pre-Storm Flow Stage is occurring per Storm Flow Stage Determination steps at the end of this checklist.

___ 1.3 Notify Utilities Division Manager when the Full Storm Flow Stage is occurring per Storm Flow Stage Determination steps at the end of this checklist.

2. INITIAL ACTIONS

___ 2.1 Report to UDOC when established

___ 2.2 Continue to monitor weather forecasts and stream flow stages

3. POST STORM FLOW NOTIFICATIONS

___ 3.1 Notify Utilities Division Manager when the National Weather Service no longer forecasts heavy rainfall

___ 3.2 Notify Utilities Division Manager when flow at the 22nd Street Bridge stream gauge is under the post storm flow stage, as indicated in Table 2.

Completed by: _____ Date/Time: _____

Title: _____ Total Hours: _____

STORM FLOW STAGE DETERMINATION

Pre Storm Flow Stage is occurring when the National Weather Service (NWS) forecasts heavy rainfall of more than 0.3 inches per hour or more than 2 inches within a 24-hour period

Full Storm Flow Stage is occurring when:

- NWS forecasts heavy rainfall of more than 0.3 inches per hour or more than 2 inches within a 24-hour period, **and**
- Flow at specific gauging station location in each channel reaches or exceeds the levels indicated in Table 1 and illustrated on Figures 8 thru 15.
- Receive "high flow" notification from mobile patrols, automatic stream gauge alarm system, or other source.

Post Storm Flow Stage is occurring when flow at the 22nd Street Bridge Stream Gauge is under the post storm flow stage, as indicated in Table 2.

CONFIRM/VERIFY USING COUNTY WEBSITE STAGE READING:

Go to www.SLOCountyWater.org

1. From the orange menu bar at the top of the page, navigate to:
Real-Time Water Data → Stream Flow
2. From the "Station" pull-down menu (mid-page), select:
"22nd Street Bridge", "Valley Road", "Lagoon", "Meadow Creek", or "Pier Avenue"

(Alternately, click on the appropriate green icon on map.)

3. From this webpage:

The "Stream Stage Hydrograph" (stage plot) shows the height of the water over time. The County website offers plots with 3-, 5-, 7-, and 14-day intervals. (The default view is the 14-day interval.)

The "Stream Stage Data" (data table) presents tabular stage data, logged every 15 minutes and when the stage changes by 0.05 feet or more.

Notes:

The "Stream Stage Hydrograph" and "Stream Stage Data" web pages are updated every 10 minutes.

Be sure to check the date and time the page or chart was updated to ensure that the presented stage data is current.

CONFIRM/VERIFY AT STAFF GAUGE:

Refer to Figure 7 for staff gauge locations.

1. To view the staff gauge readings:

Valley Road staff gauge is located on the northerly side of the southwestern bridge pier on the downstream side of the bridge. Refer to photo below.

22nd Street staff gauge is located on the southerly side of the middle bridge pier on the upstream side of the bridge. Refer to the photo below.



Valley Road Staff Gauge
(Standing on downstream side looking South at Bridge)



22nd Street Bridge
(Standing on upstream side looking North)

2. Read water surface elevation on staff gauge. The bottom reflector marker (yellow) designates the start of the full-storm flow stage and the top reflector marker (yellow) designates the anticipated flood stage.

CONFIRM/VERIFY ELECTRONIC READING AT STAFF GAUGE:

1. To view the electronic stage gauge reading, unlock lid (Southco key, # CH751) to instrument housing and open lid on data logger
2. Press the “On/Off” button once.
3. Startup screen disappears and “Stage...” appears
4. Press the “Enter” button to measure (and display) the current stage
*Unit will automatically turn off after 5 minutes of non-use.

CHECKLIST 2: UDOC RESPONSE

PURPOSE: The purpose of this checklist is to provide a list of steps to assist the **Utilities Division Operations Center (UDOC)** in responding to a potential levee failure or other flood emergency. The UDOC is staffed by Utilities Division office personnel and includes one office staff monitoring rainfall and stream gauges, a second office staff coordinating administrative issues.

QUALIFYING CONDITIONS

- _____ Receive notification from Public Works Weather Watcher of heavy rainfall
- _____ National Weather Service forecasts heavy rainfall of more than 0.3 inches per hour or more than 2 inches within a 24-hour period

1. PRE STORM FLOW STAGE RESPONSE ACTIONS

- _____ 1.1 Check and confirm that UDOC equipment is available in working order:
 - computers (3) with internet access;
 - back-up power source
 - phone
 - maps, plans and documents
 - pens, paper, whiteboard/markers for documentation purposes
- _____ 1.2 Ensure ALERT notices are turned ON
- _____ 1.3 Reserve the 4wd Ford Escape, pool vehicle #1270, for Patrol 2 to use during channel inspections.
- _____ 1.4 Use paragraph 6 of Procedural Memorandum AD-18 (Appendix 1) to assign and place on standby 2-person mobile patrols (Road Maintenance or Utilities Operations personnel).
 - Patrol Area 1 assigned to: Utilities South County Operations
 - Patrol Area 2 assigned to: Utilities Office Staff
 - Patrol Area 3 assigned to: Roads Maintenance (Yard 3)
- _____ 1.5 Place Patrols 1 and 3 on stand-by.
- _____ 1.6 Request Patrol 2 perform pre-storm flow inspection on the three (3) areas of the channel system shown on Figures 3 through 6. Note: Patrol should follow steps in Checklist 5 (Patrol Squad Pre-

- Storm Inspection) and review Personal Safety Plan included in Appendix 6.
- _____ 1.7 Follow up with Patrol 2 to get a verbal report on the condition of the facilities and if there is a deficiency that needs correction. Assist, as necessary, to implement repairs.
 - _____ 1.8 Check and confirm availability of equipment and supplies that may be needed to implement emergency repairs, debris removal, or other flood fight measures including but not limited to Temporary Levee Protection and Manual Breaching Operation.
 - _____ 1.9 Provide frequent updates to the Utilities Division Manager regarding the storm status and channel conditions. Immediately notify the Utilities Division Manager if repairs are necessary and if additional or other resources will be necessary implement necessary repairs.

If storm escalates and/or channel flows increase to levels above elevations shown for locations on Figures 8 thru 15 or listed in Table 1, move to step 2 below and initiate Full Storm Flow Stage Response.

- _____ Receive "high flow" notification from mobile patrols, automatic stream gauge alarm system, or other source (i.e., Weather Watcher).

2. FULL STORM FLOW STAGE RESPONSE ACTIONS

- _____ 2.1 Report to UDOC.
- _____ 2.2 Continually monitor rainfall and creek levels per guidelines in Checklist 1, and record creek levels.
- _____ 2.3 Estimate rates of increase of creek levels. Rates of increase of water surface elevation for each channel for varying rainfall intensities are included in Appendix 4 to assist with determining how much time there is before an evacuation of the flood zone is necessary.
- _____ 2.4 Use paragraph 6 of Procedural Memorandum AD-18 (Appendix 1) to assign 2-person mobile patrols (Road Maintenance or Utilities South County Operations personnel) to inspect three (3) areas of the channel shown on Figures 3 through 6. Note: Patrols should follow steps in Checklist 6.

Patrol Area 1 assigned to: Utilities South County Operations

Patrol Area 2 assigned to: Utilities Office Staff

Patrol Area 3 assigned to: Roads Maintenance (Yard 3)

- _____ 2.5 Use paragraph 6 of Procedural Memorandum AD-18 (Appendix 1) to assign next shifts of Patrols 1, 2, and 3, and UDOC; place staff on standby and provide an estimated time to report.
- _____ 2.5.1 Second and all subsequent shifts for Patrol 2 should report directly to 22nd Street Bridge for hand off of 4WD vehicle (County Vehicle #1270). Instruct Patrol 2 to drive another county vehicle to 22nd Street Bridge so that exiting shift has transportation to leave and return to office.
- _____ 2.6 Follow up with patrols to get a verbal report on the condition of the facilities; patrols should report if there is a channel deficiency that needs correction
- Note: Channel deficiencies may include, but are not limited to: excessive debris or anything that might cause a reduction in capacity, blockages in flap gates, erosion of levee slopes or settlement of fill, etc***
- _____ 2.7 Coordinate necessary repair and maintenance to correct any deficiency that prevents proper operation of the facilities.
- If time permits, prior to conducting any repair or maintenance to the levees or within the channel itself, the Public Works Environmental staff should be contacted per Procedural Memorandum AD-18 (Appendix 1).***
- _____ 2.8 Follow up with **NOAA LOX** if high creek levels persist or are threatening to overtop levees. Seek forecaster confidence on additional rainfall amounts and intensity.
- _____ 2.9 Continue to monitor channel conditions.
- _____ 2.10 Continue to provide updates to Utilities Division Manager on the condition of levee. Specifically, if there is a threat that failure may be imminent.

Immediately notify the Utilities Division Manager and/or Director if conditions worsen, and a flood emergency becomes imminent.

A **levee failure/flood emergency** may be determined **imminent** when any of the following conditions exists. If more than one condition exists, potential for and level of flood hazard is increased.

- _____ Increasing rainfall amounts and intensities as reported by **NOAA LOX or the National Weather Service.**
- _____ Creek levels approaching or exceeding anticipated flood stage, or creek levels within 2 feet of north levee top, as reported by mobile patrols, automatic stream gauge alarm system, or other source.

- _____ Lopez Dam is approaching spill elevation or is already spilling.

- _____ Other area emergency such as excessive debris, erosion or settlement of levee fill/slopes, as reported by Patrol Squads, that are not repairable and are anticipated to result in a levee failure or flood event.

Move to step 3 below if one or more of the conditions listed above exists.

3. IMMEDIATE FLOOD EMERGENCY RESPONSE ACTIONS

A **levee failure/flood emergency** is when the system has exceeded capacity and/or flood waters are escaping the channel and levee system. The south, north or both levees may be overtopping or flap gates may be stuck/blocked open and resulting in flooding to low areas adjacent to the channel.

- _____ 3.1 Continue to monitor channel conditions.
- _____ 3.2 Continue to assist the Utilities Division Manager throughout the flood emergency.

4. POST STORM FLOW ACTIONS

- _____ 4.1 In accordance with Checklist 1, confirm/verify flow at the stream gauge at the 22nd Street Bridge is under the post storm flow stage
- _____ 4.2 Notify Utilities Division Manager that storm flows have ceased and that major operations effort has been completed.
- _____ 4.3 Notify any shifts (Patrols 1, 2, and 3, and UDOC staff) on stand-by that storm flows have ceased and to stand down.
- _____ 4.4 Follow-up with the Public Works Environmental staff regarding any repairs or maintenance activities to determine if any mitigation is necessary
- _____ 4.5 Collect completed Checklists 1, 2, 5, and 8A.
- _____ 4.6 Document operations and maintenance efforts during storm event

Completed by: _____ Date/Time: _____

Title: _____ Total Hours: _____

CHECKLIST 3: UTILITIES DIVISION MANAGER RESPONSE

PURPOSE: The purpose of this checklist is to provide a list of steps to assist the **Utilities Division Manager** in responding to a potential levee failure or other flood emergency.

QUALIFYING CONDITIONS

- _____ Receive notification from Public Works Weather Watcher of heavy rainfall
- _____ National Weather Service forecasts heavy rainfall of more than 0.3 inches per hour or more than 2 inches within a 24-hour period

1. PRE STORM FLOW STAGE RESPONSE ACTIONS

1.1 Notifications

- _____ 1.1.1 Alert Director or his designee and place on emergency standby to open PW DOC.
- _____ 1.1.2 Alert **OES Duty Officer** and place on emergency standby. Discuss outlook and anticipated issues or resources needed.
- _____ 1.1.3 Alert Public Works UDOC staff and Environmental Programs Division per Procedural Memorandum AD-18 (Appendix 1).

Request that UDOC staff: Alert Public Works emergency crews (Utilities South County Operations/Road Maintenance personnel) and place on emergency standby for possible activation under the Full-Storm Flow Stage.
- _____ 1.1.4 Alert Road Maintenance Manager to prepare for potential mobilization of equipment to stage for a potential south levee breach.
- _____ 1.1.5 Establish communication with **City of Arroyo Grande** request to speak with on-duty maintenance personnel. Coordinate pumping activities (Elm Street Park and Soto Sports Complex).

1.2 Actions

- _____ 1.2.1 Confirm UDOC and Patrols are staffed, as necessary per AD-18
- _____ 1.2.3 Request frequent updates on storm and channel conditions from Weather Watcher or assigned monitor in the UDOC.
- _____ 1.2.3 Request Pre-Storm Inspection report from Patrol 2.

- _____ 1.2.4 Confirm that available labor, equipment and other resources are adequate to implement necessary repairs or other anticipated flood fight measures.
- _____ 1.2.5 Contact **County OES Duty Officer** as necessary, to request assistance with procurement of labor, equipment, or other resources needed to implement necessary repairs or other anticipated flood fight measures.

If storm escalates and/or channel flows increase to levels above elevations shown for locations on Figures 8 thru 15 or listed in Table 1, move to step 2 below and initiate Full Storm Flow Stage Response.

- _____ Receive "high flow" notification from mobile patrols, automatic stream gauge alarm system, or other source (i.e., Weather Watcher).

2. FULL STORM FLOW STAGE RESPONSE ACTIONS

2.1 Notifications

- _____ 2.1.1 Provide situation update to Director or his designee that the UDOC will be open and to open PW DOC, if not already open.
- _____ 2.1.2 Provide situation update to **OES Duty Officer**. Discuss and request any assistance needed.
- _____ 2.1.3 Alert **Sheriff's Watch Commander**. Request that the Watch Commander be prepared to implement the Dam and Levee Failure Evacuation Plan and be prepared to activate the Emergency Alert System due to potential levee failure and flood emergency. Request deputies for route alerting of residents, as necessary, or to place deputies for route alerting on standby.
- _____ 2.1.4 Alert **Five Cities Fire Dispatch**.
- _____ 2.1.5 Alert **Oceano Community Services District**. After hours staff contact information is included in Appendix 2.
- _____ 2.1.6 Alert **South County Sanitation District** and speak with on-call operator. Additional, after hours staff contact information is included in Appendix 2.
- _____ 2.1.7 Alert **County Environmental Health Services**.
- _____ 2.1.8 Alert **Oceano Airport**
- _____ 2.1.9 Alert **Union Pacific Railroad**.
- _____ 2.1.10 Alert **NOAA LOX** and provide status that AG Channel is being monitored for high flows and potential overtopping.

- _____ 2.1.11 IF there is potential for a north levee failure that could be alleviated by manually breaching south levee to provide channel relief, then:
 - _____ 2.1.11.1 See sections 3 and 4 of this checklist for actions.
 - _____ 2.1.11.2 Alert Road Maintenance Manager to initiate mobilization of equipment to stage for a potential implementation of south levee breach.
 - _____ 2.1.11.3 Instruct Road Maintenance Manager to follow the guidelines in Checklist 8.

2.2 ACTIONS

- _____ 2.2.1 Report to UDOC, if not already there.
- _____ 2.2.2 Request UDOC alert Public Works emergency crews (Utilities Operations/Road Maintenance personnel) for activation under the Full-Storm Flow Stage. Emergency Call List is included in Appendix 2.
- _____ 2.2.3 Direct Utilities South County Operations to shut off Lopez Dam releases.
- _____ 2.2.4 Notify Environmental Division that Lopez Dam releases have been shut off.
- _____ 2.2.5 Call City of Arroyo Grande and request to speak with on-duty maintenance personnel. Request that the City of Arroyo Grande halt pumping activities at Elm Street Park and Soto Sports Complex.
- _____ 2.2.6 As necessary, set up a field command post at the Oceano Community Services District Meeting Room or other appropriate location. If Public Works does not have the resources to staff the command post, alert **OES**, and request assistance.
- _____ 2.2.7 Ensure other applicable agencies are notified of command post establishment.
- _____ 2.2.8 Notify Director if a field command post is set up and request that he or his designee report to it. The Director may designate either the Deputy Director or the Transportation Division Manager to report to the field command post in his place.
- _____ 2.2.9 Continue to receive updates on channel conditions from UDOC and Patrol Squads.
- _____ 2.2.10 Continue to provide updates to Director on the condition of levee. Specifically, if there is a threat that failure may be imminent.

Immediately notify the Director if conditions worsen, and a flood emergency becomes imminent.

A levee failure/flood emergency may be determined imminent when any of the following conditions exists. If more than one condition exists, potential for and level of flood hazard is increased.

- _____ Increasing rainfall amounts and intensities as reported by **NOAA LOX or the National Weather Service.**
- _____ Creek levels approaching or exceeding anticipated flood stage, or creek levels within 2 feet of north levee top, as reported by mobile patrols, automatic stream gauge alarm system, or other source.
- _____ Lopez Dam is approaching spill elevation or is already spilling.
- _____ Other area emergency such as excessive debris, erosion or settlement of levee fill/slopes, that are not repairable and are anticipated to result in a levee failure or flood event.

Move to step 3 below if one or more of the conditions listed above exists.

3. IMMEDIATE FLOOD EMERGENCY RESPONSE ACTIONS

A **levee failure/flood emergency** is when the system has exceeded capacity and/or flood waters are escaping the channel and levee system. The south, north or both levees may be overtopping or flap gates may be stuck/blocked open and resulting in flooding to low areas adjacent to the channel.

If flooding to north is occurring or about to occur and may be alleviated by implementing manual breach of the south levee, then proceed with the following notifications and move directly to step 4 after.

3.1 NOTIFICATIONS

- _____ 3.1.1 Notify the Director if the above conditions exist, worsen, and a flood emergency becomes imminent. Recommend the Director follow the steps in Checklist 4.

Utilities Division Manager shall continue with the following notifications, as necessary or as directed by the Director or designee.

- _____ 3.1.2 Alert **Watch Commander** that a levee failure and flood emergency is imminent or occurring and:

- _____ 3.1.2.1 Provide the situation status report and discuss the critical nature of the problem. Discuss information such as location of water in stream channels, amount of flooding occurring, special rescue efforts that may be needed and related response needs.

- _____ 3.1.2.2 Request notification of affected area. Describe specific areas to be evacuated per Figures 16, 17, or 18 (Flood Evacuation Zone Maps). Report what areas need to be evacuated (Area north of levee, south of levee, Oceano Lagoon Area, or combination of 2 or all.) Watch Commander can utilize sirens, emergency alert system, route alerting and Reverse 911 based upon needs.
- _____ 3.1.2.3 Request an estimated time when evacuation will be completed and for a confirmation call when done.
- _____ 3.1.3 Alert **OES Duty Officer**.
- _____ 3.1.4 Alert **Five Cities Fire Dispatch**.
- _____ 3.1.5 Alert **Oceano Community Services District** of imminent levee failure. After hours staff contact information is included in Appendix 2.
- _____ 3.1.6 Alert **South County Sanitation District** of imminent levee failure. Additional, after hours staff contact information is included in Appendix 2.
- _____ 3.1.7 Alert **County Environmental Health Services** of imminent levee failure.
- _____ 3.1.8 Alert **Oceano Airport** at of imminent levee failure.
- _____ 3.1.9 Alert **Union Pacific Railroad** of imminent levee failure.

4. EMERGENCY MANUAL BREACH OPERATION

If high creek flows persist with continued or increasing rainfall, and channel is reaching capacity (within 2-feet of top of north levee), it may be necessary to provide channel relief by implementing a manual breach on the south levee. Refer to Figures 19 and 20.

4.1 Pre-Breach Actions

- _____ 4.1.1 Follow up with **NOAA LOX** when creek levels are within 2 feet of the north levee top (WSE ~ 33.0 feet) at the 22nd Street Bridge. Seek forecaster confidence on additional rainfall amounts and intensity.
- _____ 4.1.2 Alert Director or his designee that a north levee failure is imminent and recommend initiating south levee breach to provide channel relief
 - _____ 4.1.2.1 Request Director to make recommendation to the County Emergency Services Director.
 - _____ 4.1.2.2 Request a confirmation call when south levee breaching operation is authorized by the County Emergency Services Director.

4.2 Manual Breach Actions

- _____ 4.2.1 Alert **Watch Commander** that a manual breach of the south levee will be implemented.
 - _____ 4.2.1.1 Request notification and evacuation of affected area. Describe specific areas to be evacuated per Figures 16, 17, or 18 (Flood Evacuation Zone Maps). Report what areas need to be evacuated (Area north of levee, south of levee, Oceano Lagoon Area, or combination of 2 or all.) Watch Commander can utilize sirens, emergency alert system, route alerting and Reverse 911 based upon needs.
 - _____ 4.2.1.2 Request an estimated time when evacuation will be completed and for a confirmation call when done.
 - _____ 4.2.1.3 Request notification of Cal Fire staging of swift water rescue assistance.
- _____ 4.2.2 Alert Roads Maintenance Manager to initiate mobilization of Breach Operator to south levee breaching site. Roads Maintenance Manager should follow guidelines in Checklist 8; Breach Operator should follow guidelines in Checklist 9.
- _____ 4.2.3 Alert responding Public Works emergency crews (Utilities Operations/Road Maintenance personnel) that a north levee failure is imminent and the south levee will be breached.
 - a) Instruct ranking persons in Patrol 2 and 3 to go to the south levee breaching site to confirm order to breach for breach operator and witness breach operations.
 - b) Instruct all others to remain at a safe observation distance from the channel system and outside of the Flood Evacuation Zone shown on Figure 16.
- _____ 4.2.4 Request Public Works emergency crews (Utilities Operations/Road Maintenance personnel) close off all roads to evacuation areas.
- _____ 4.2.5 Confirm with **Watch Commander** that all areas anticipated to be impacted by south levee breaching activities have been evacuated.
- _____ 4.2.6 Confirm that Cal Fire and Sheriff are on standby at south levee breaching site in a safe location. Refer to Figure 20, for Safe Point Assembly area.
- _____ 4.2.7 Direct Breach Operator to implement South Levee Breach per Checklist 9

4.3 Post Levee Breach Actions

- _____ 4.3.1 Obtain updated report from patrols on the condition of the facilities including location of levee breach/failure and approximate extent and depth of flows outside channels:

Location of breach/failure:

Extent of flow outside of channels: _____

Depth of flow outside of channels: _____

- _____ 4.3.2 Request PW DOC assign emergency crews to barricade off roads leading to flooded areas (or confirm that flooded areas have already been closed off)

5. POST STORM FLOW ACTIONS

- _____ 5.1 In accordance with Checklist 1, Section 2 (Post-Storm Flow Stage Determination), confirm/verify flow at the stream gauge at the 22nd Street Bridge is under the post storm flow stage
- _____ 5.2 Notify Director that major operations efforts to mitigate the levee failure emergency have been completed and that storm flows have ceased. Recommend the Director notify, as necessary:
- _____ 5.2.1 OES Duty Officer
 - _____ 5.2.2 Emergency Services Director
- _____ 5.3 Follow-up with the **City of Arroyo Grande** and request to speak with on-duty maintenance personnel. Provide update of flood emergency and remove request to halt pumping activities at Elm Street Park and Soto Sports Complex. Relay that storm flows have ceased and end emergency standby.
- _____ 5.4 Notify Public Works emergency crews that storm flows have ceased and end emergency standby; may allow partial demobilization
- _____ 5.5 Assign 2-person mobile patrols to inspect facilities
- _____ 5.6 Follow-up with patrols to obtain report of all damaged flood control facilities or appurtenant structures

- _____ 5.7 Initiate temporary or permanent repair of damaged flood control facilities
- _____ 5.8 Inventory equipment and materials and make ready for subsequent stream flows.
- _____ 5.9 Follow-up with the Public Works Environmental staff regarding any repairs or maintenance activities to determine if any mitigation is necessary
- _____ 5.10 Follow-up with **County Environmental Health Services** so they may begin assessment of general health issues and authorize re-habitation.
- _____ 5.11 Collect completed Checklists 1 thru 9.
- _____ 5.12 Document operations and maintenance efforts during emergency response efforts; include photographs of storm damage that were taken by patrols during inspections and performed maintenance

CHECKLIST 4: PUBLIC WORKS DIRECTOR RESPONSE

PURPOSE: The purpose of this checklist is to provide a list of steps to assist the **Public Works Director or designee**, in responding to a potential levee failure or another flood emergency. The Public Works Director will initiate the steps in this checklist when:

_____ Receive communication from the Utilities Division Manager or UDOC indicating that flooding is or is anticipated to occur under the Full Storm Flow Stage.

_____ Receive communication from the Utilities Division Manager or UDOC indicating that a field command post is set up.

1. FULL STORM FLOW ACTIONS

_____ 1.1 Open up PW DOC, if not already open.

_____ 1.2 Report to the field command post, if set up. The Director may designate either the Deputy Director or the Transportation Division Manager to report to the field command post in his place.

_____ 1.3 Request frequent updates on storm and channel conditions from Utilities Division Manager.

A levee failure/flood emergency may be determined **imminent** when any of the following conditions exists. If more than one condition exists, potential for and level of flood hazard is increased.

_____ Increasing rainfall amounts and intensities as reported by **NOAA LOX or the National Weather Service.**

_____ Creek levels approaching or exceeding anticipated flood stage, or creek levels within 2 feet of north levee top, as reported by mobile patrols, automatic stream gauge alarm system, or other source.

_____ Lopez Dam is approaching spill elevation or is already spilling.

_____ Other area emergency such as excessive debris, erosion or settlement of levee fill/slopes, that are not repairable and are anticipated to result in a levee failure or flood event.

Move to step 2 below if one or more of the conditions listed above exists as confirmed by the Utilities Division Manager.

2. IMMEDIATE FLOOD EMERGENCY RESPONSE ACTIONS

A **levee failure/flood emergency** is when the system has exceeded capacity and/or flood waters are escaping the channel and levee system. The south, north or both levees may be overtopping or flap gates may be stuck/blocked open and resulting in flooding to low areas adjacent to the channel.

- _____ 2.1 Direct Utilities Division Manager to alert Watch Commander and initiate notification and evacuation of affected areas.
- _____ 2.2 Update Field Command Post or Alert **OES Duty Officer** that a levee failure and flood emergency is imminent and:
 - _____ 2.2.1 Provide the situation status report and discuss the critical nature of the problem. Discuss information such as location of water in stream channels, amount of flooding occurring, special rescue efforts that may be needed and related response needs.
 - _____ 2.2.2 Recommend activation of County Emergency Operations Center per the Dam and Levee Failure Response Plan
 - _____ 2.2.3 Request notification of the County Emergency Services Director, consistent with the Dam and Levee Failure Response Plan:
 - _____ 2.2.4 Provide confirmation that Watch Commander has been notified.

3. EMERGENCY MANUAL BREACH OPERATION

If high creek flows persist with continued or increasing rainfall, and channel is reaching capacity (within 2-feet of top of north levee), it may be necessary to provide channel relief by implementing a manual breach on the south levee. Refer to Figures 19 and 20.

3.1 Initial Notifications

- _____ 3.1.1 Receive notification from Utilities Division Manager or UDOC, that a north levee failure is imminent and implementation of a manual breach on the south levee is recommended to provide channel relief

3.2 Pre-Levee Breach Actions

- _____ 3.2.1 Alert the County Emergency Services Director that a levee failure and flood emergency is imminent or occurring and:
 - _____ 3.2.1.1 Provide the situation status report and discuss the critical nature of the problem; i.e. describe risks should failure of the north levee occur. Discuss

information such as location of water in stream channels, amount of flooding occurring, special facilities, number of residences that could be impacted, special rescue efforts that may be needed and related response needs.

_____ 3.2.1.2 Recommend that a manual breach of the south levee could be necessary to provide channel relief and request authorization to proceed with manual breach operation.

_____ 3.2.2 Follow up with **Utilities Division Manager / UDOC** to provide confirmation that manual levee breaching operation is authorized by the County Emergency Services Director and direct Utilities Division Manager to proceed with Manual Breaching Operation. Utilities Division Manager should follow steps in Checklist 3, Section 4.2 Manual Breach Actions.

_____ 3.2.2.1 Request an estimated time when Manual Breaching Operation will be completed and for a confirmation call when done.

3.3 Post Levee Breach Actions

_____ 3.3.1 Obtain updated report from **Utilities Division Manager or designee** on the condition of the facilities including location of levee breach/failure and approximate extent and depth of flows outside channels:

Location of breach/failure:

Extent of flow outside of channels: _____

Depth of flow outside of channels: _____

_____ 3.3.2 Provide the situation status report to Emergency Services Director, as necessary. Discuss information such as location of water outside stream channels, amount of flooding occurring, special rescue efforts that may be needed and related response needs.

4. POST STORM FLOW ACTIONS

- _____ 4.1 Receive notification from Utilities Division Manager that major operations efforts to mitigate levee failure and flood emergency have been completed and/or that storm flows have ceased.

- _____ 4.2 Notify Emergency Services Director and the OES Duty Officer that major operations efforts to mitigate the levee failure emergency have been completed and that storm flows have ceased. Recommend standing down or demobilization of emergency workers.

CHECKLIST 5: PATROL – PRE-STORM FLOW INSPECTION

PURPOSE: The purpose of this checklist is to provide a list of steps to assist the **Utilities Division Engineering Staff**, in responding to the Pre-Storm Flow Stage.

1. PRE STORM FLOW STAGE RESPONSE ACTIONS

- _____ 1.1 Reserve the 4wd Ford Escape, pool vehicle #1270, for patrol use during anticipated storm. May need to reserve vehicle for a number of days.
- _____ 1.2 Check equipment/supplies in emergency response kit to ensure stocked and in working order (i.e., flashlights with batteries, radios with charged batteries, etc.).
- _____ 1.3 Place emergency response kit into pool vehicle #1270, so it is available to patrols.
- _____ 1.4 Verify vehicle #1270 has full tank of fuel. If not, then fill fuel tank.
- _____ 1.5 Review Personal Safety Plan for Arroyo Grande Creek Channel included in Appendix 6.
- _____ 1.6 Conduct Pre-Storm Flow Inspection of the Arroyo Grande Creek Channel facilities as soon as possible, prior to receiving rainfall / or start of storm. (See #2 below)
- _____ 1.7 Unlock and leave open the 8 swing gates along the tops of the levees. See Figure 7 for swing gate locations.

2. PRE STORM FLOW INSPECTION

- _____ 2.1 Check that channels are clear of excessive debris or natural barriers, i.e.
 - Trees _____

 - Beaver dams _____

 - Accumulation of debris _____

 - Anything that might cause a reduction in channel capacity _____

_____ 2.2 Check inlet (landside) of drain culverts in levee; ensure all inlets are in good condition (See Figure 7)

_____ 2.3 Check outlet flap gates of all drain culverts in levee; ensure all gates are free of debris for proper operation (See Figure 7)

_____ 2.4 Check that access roads, tops of levees, and swing gates are in good accessible condition _____

Is there settlement of fill? _____

Is there erosion of slope? _____

Is vegetation on the levee restricting access? _____

Are there burrowing animals? _____

_____ 2.5 Check stream gauges. Note water surface elevation (WSE) and verify there are no obstructions between gauge sensor and water surface level

Valley Road Bridge WSE: _____

Obstructions: _____

22nd Street Bridge WSE: _____

Obstructions: _____

Arroyo Grande Lagoon WSE: _____

Obstructions: _____

Meadow Creek Lagoon WSE: _____

Obstructions: _____

Pier Avenue Bridge WSE: _____

Obstructions: _____

3. INSPECTION FOLLOW-UP ACTIONS

- _____ 3.1 Immediately provide verbal report to Utilities Division Manager / UDOC
- _____ 3.2 Subsequently, attach any photos and submit inspection form to the UDOC.

Inspector: _____ Date/Time: _____

CHECKLIST 6: PATROL – FULL STORM FLOW INSPECTION

Inspector: _____ **Date:** _____

Purpose: The purpose of this checklist is to provide a list of inspection items to assist the Utilities Division / Road Maintenance Personnel in responding to the full storm flow stage. Channel conditions will be monitored regularly during the storm event(s), as needed and requested. **Immediately report any issues to the Utilities Division Manager/UDOC at 781-4264.**

Inspection Items					
Channels are clear of excessive debris or other natural barriers, i.e. trees, beaver dams, other	Flap Gates are free of debris for proper operation	Access roads/top of levees are in drivable condition	Check condition of levees and surrounding landside areas that may indicate damage/failure.	Overall condition of channel system	Water Surface Elevations on staff gauges
					Valley _____ 22nd _____ Lagoon _____ Meadow Ck _____ Pier Ave _____
					Valley _____ 22nd _____ Lagoon _____ Meadow Ck _____ Pier Ave _____
Check-in with UDOC					
Subsequently, attach any photos and submit inspection form to the Utilities Division Manager					

CHECKLIST 6: PATROL – FULL STORM FLOW INSPECTION (CONTINUED)

Inspector: _____ Date: _____

Inspection Items					
Channels are clear of excessive debris or other natural barriers, i.e. trees, beaver dams, other	Flap Gates are free of debris for proper operation	Access roads/top of levees are in drivable condition	Check condition of levees and surrounding landside areas that may indicate damage/failure.	Condition of temporary levee protection	Water Surface Elevations on staff gauges
Time: _____					Valley _____ 22nd _____ Lagoon _____ Meadow Ck _____ Pier Ave _____
					Valley _____ 22nd _____ Lagoon _____ Meadow Ck _____ Pier Ave _____
Check-in with UDOC _____ a minimum of every 30 minutes while patrolling levee areas Subsequently, attach any photos and submit inspection form to the Utilities Division Manager					

CHECKLIST 7: PATROL – POST STORM FLOW INSPECTION

Inspector: _____ **Date/Time:** _____

Purpose: The purpose of this checklist is to provide a list of steps to assist the **Utilities Division Personnel** in conducting the post-storm flow inspection to assess storm damages and initiate feasible repairs. Observed damages should be recorded and photographed.

Item	Satisfactory (S) or Unsatisfactory (US) (Circle one)		Location of Issue
Channel			
1. Channels are clear of excessive debris or natural barriers, i.e: • Trees • Beaver dams • Anything that might cause reduction in channel capacity	S	US <input type="checkbox"/> Trees <input type="checkbox"/> Beaver Dams <input type="checkbox"/> Other	
2. Side drain inlet gates are free of debris for proper operation	S	US	<input type="checkbox"/> Sand Canyon <input type="checkbox"/> Los Berros <input type="checkbox"/> Inlet No. _____ (See Figure 7)
Levees			
3. Access road(s), or top of levee(s), are in good condition	S	US	
4. Check condition of levees and surrounding landside areas that may indicate damage/failure.	S	US <input type="checkbox"/> Wavewash <input type="checkbox"/> Boils <input type="checkbox"/> Seepage <input type="checkbox"/> Cracks <input type="checkbox"/> Sloughing	
5. Condition of Temporary Levee Protection?	S	US	
Stream Gauges			
6. Verify no obstructions between gauge sensor and water surface level	S	US	<input type="checkbox"/> Valley Road Bridge <input type="checkbox"/> 22 nd Street Bridge
7. Note water surface elevation on staff gauges	Valley Rd. Gauge Reading _____		22 nd St. Gauge Reading _____

Immediately provide verbal report to Utilities Division Manager / UDOC.
 Subsequently, attach any photos and submit completed inspection form to the Utilities Division Manager.

CHECKLIST 8: ROAD MAINTENANCE MANAGER – MANUAL LEVEE BREACH ACTIONS

PURPOSE: The purpose of this checklist is to provide a list of steps to direct the **Road Maintenance Manager or his designee** to provide contract breach operator for implementing a manual breach of the levees.

1. PRE-STORM FLOW ACTIONS

- _____ 1.1 Prepare for potential mobilization of equipment to stage for potential south levee breach.
- _____ 1.2 Hire breach operator(s).

2. FULL STORM FLOW ACTIONS

- _____ 2.1 Receive notice from Utilities Division Manager (Public Works Director), or his designee, to hire and mobilize a contract breach operator and equipment.
- _____ 2.2 Gather contact information for the breach operators. Provide breach operator(s) with handheld radios and Breach Operator Checklist(s).
- _____ 2.3 Place Breach Operator on-call (standby).

3. IMMINENT FLOOD EMERGENCY RESPONSE ACTIONS

- _____ 3.1 Direct Breach Operator to the mobilization site.
- _____ 3.2 Verify location to be breached and review levee breach procedures to understand actions.
- _____ 3.3 Report the following to the Utilities Division Manager/UDOC:
 - when equipment is enroute,
 - the estimated time for arrival and setup
- _____ 3.4 Verify breach operator(s) have arrived and are in place ready for breach operation. When set up report the following to the Utilities Division Manager / UDOC:
 - where equipment is staged,
 - the status of the breach sites
 - that all equipment is operational and ready to implement breaching activity.

- Anything unusual that could present an unsafe or ineffective condition

4. EMERGENCY MANUAL BREACH OPERATION

- _____ 4.1 Confirm with UDOC manual levee breach is authorized. Ensure all actions and notifications have been completed before breach is implemented.
- _____ 4.2 Direct Breach Operator to implement manual levee breach after confirming with UDOC.

5. DE-MOBILIZATION ACTIONS

- _____ 5.1 Collect radios from breach operator(s).
- _____ 5.2 Record ending time and total hours of use.

Completed by: _____ Date/Time: _____

Title: _____ Total Hours: _____

CHECKLIST 9: BREACH OPERATOR – IMPLEMENTATION OF MANUAL BREACH

PURPOSE: The purpose of this checklist is to provide a list of steps to direct the **Breach Operator** to prepare for and implement a manual levee breach.

_____ Receive notice from Road Maintenance Manager or his designee, to stage for a potential south levee breach.

1. MOBILIZATION / STAGING

- _____ 1.1 Collect a handheld radio from the Road Maintenance Manager
- _____ 1.2 Deliver an excavator and haul trailer to the breach site staging area.
- _____ 1.3 Perform a pre-op inspection of the equipment and ensure it is ready for use.
- _____ 1.4 Check the breach site and verify ability to conduct breach
- _____ 1.5 Clear or improve equipment escape path, as needed
- _____ 1.6 Standby for further direction from the Road Maintenance Manager. Remain on standby and ready to respond to a flood emergency event within 30 minutes.

2. LEVEE BREACH ACTIONS

- _____ 2.1 Receive notice from Roads Maintenance Manager to implement a south levee breach.
- _____ 2.2 Deliver the excavator to the breach site as directed.
- _____ 2.3 Position the excavator for breach operation and hold for further direction from the Roads Maintenance Manager.
- _____ 2.4 Report to Roads Maintenance Manager when equipment is in place, operational and ready to implement breaching activity. **STANDBY** for further direction from the Roads Maintenance Manager.
- _____ 2.5 Continually review the breach site and the surrounding as the situation changes.

- _____ 2.6 Report to Roads Maintenance Manager if any of the following is observed:
- Equipment problems
 - People enter the flood prone area
 - Anything unusual that could present an unsafe condition

*Note: Patrols 2 and 3 will be on site to witness breaching operation. Patrols 2 and 3 will be taking video/photographs of the breach operation.

- _____ 2.7 Receive confirmation from Roads Maintenance Manager it is okay to begin breaching operation.
- _____ 2.8 Breach the south levee at the designated location and maximize flow from the creek into the adjacent field.
- _____ 2.9 Relocate the excavator to a safe and accessible location.

3. STAND DOWN ACTIONS

- _____ 3.1 Receive STAND DOWN notification from the Roads Maintenance Manager.
- _____ 3.2 Report status to the Road Maintenance Manager upon leaving the breach site.
- _____ 3.3 Return and secure the equipment to the Mobilization staging location or other location as directed by the Road Maintenance Manager.
- _____ 3.4 Verify the fuel status and perform any post-op or pre-op equipment inspections to ensure the equipment is ready for another storm event.
- _____ 3.5 Photograph the breach site before leaving.

4. DE-MOBILIZATION ACTIONS

- _____ 4.1 Receive demobilization notification from the Roads Maintenance Manager.
- _____ 4.2 Report status to the Roads Maintenance Manager upon leaving the staging site.
- _____ 4.3 Photograph the staging site before leaving.

Completed by: _____ Date/Time: _____

FIGURES

- Figure 1: Arroyo Grande Creek Levee System
- Figure 2: Emergency Response Organization Chart
- Figure 3: Patrol Area Overview
- Figure 4: Patrol Area 1
- Figure 5: Patrol Area 2
- Figure 6: Patrol Area 3
- Figure 7: Levee System Facilities Map
- Figure 8: Storm Flow Stages at Valley Road Bridge, Los Berros Creek RS 24+00
- Figure 9: Storm Flow Stages at 22nd Street Bridge, Arroyo Grande Creek RS 73+00
- Figure 10: Storm Flow Stages at Arroyo Grande Creek RS 57+19, Potential Overtop Location
- Figure 11: Storm Flow Stages at Arroyo Grande Creek RS 97+74, Potential Overtop Location
- Figure 12: Storm Flow Stages at Arroyo Grande Creek RS 121+00, Downstream of Highway 1 Bridge
- Figure 13: Storm Flow Stages at Arroyo Grande Creek Near the Confluence of Meadow Creek
- Figure 14: Storm Flow Stages at Arroyo Grande Creek at Arroyo Grande Station
- Figure 15: Storm Flow Stages at Los Berros Creek Below Highway 101, Quailwood Lane Bridge
- Figure 16: Flood Evacuation Area
- Figure 17: Flood Evacuation Area – North
- Figure 18: Flood Evacuation Area – South
- Figure 19: Manual Breach Location
- Figure 20: Manual Breach Staging Areas

Figure 1: Arroyo Grande Creek Levee System

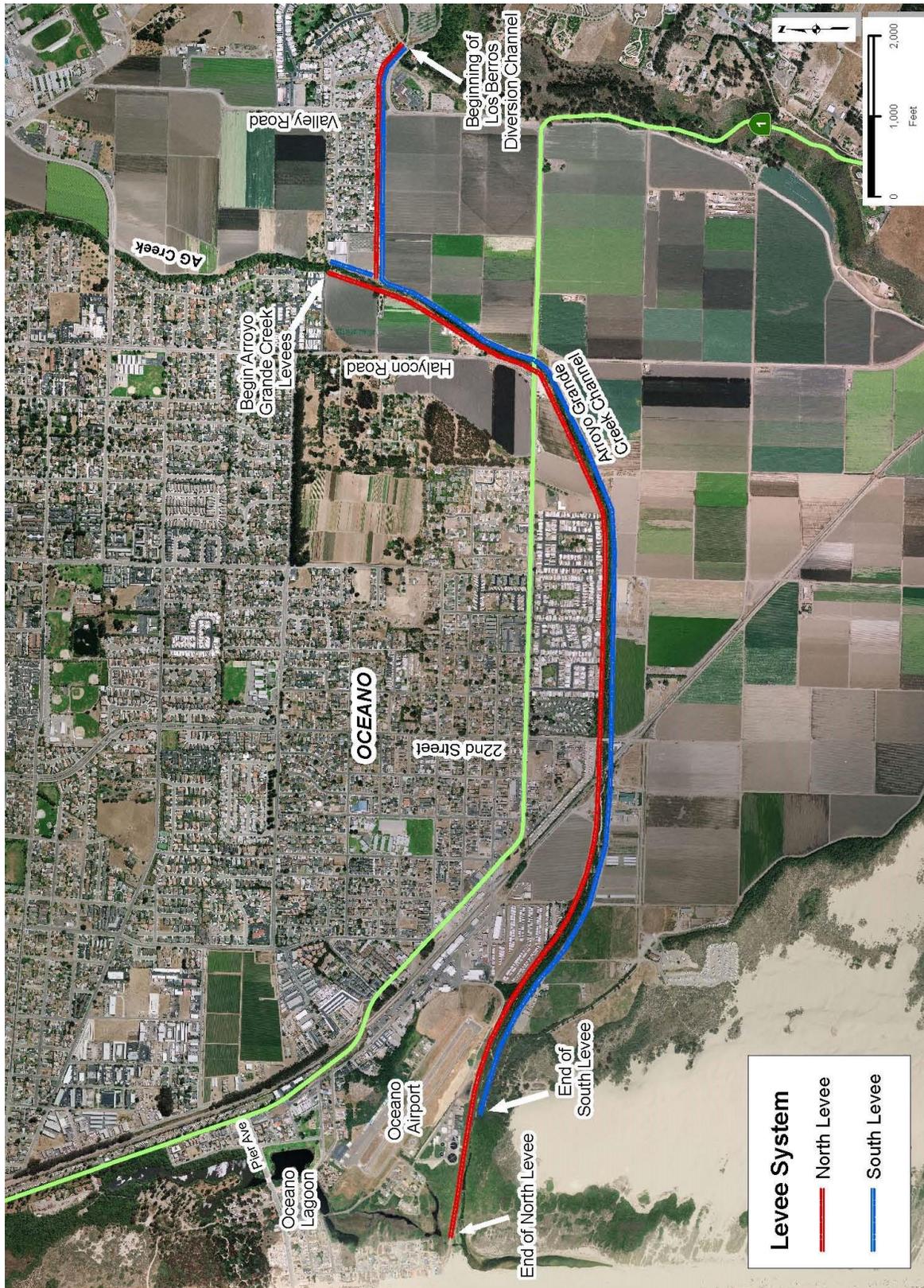


Figure 2: Emergency Response Organization Chart

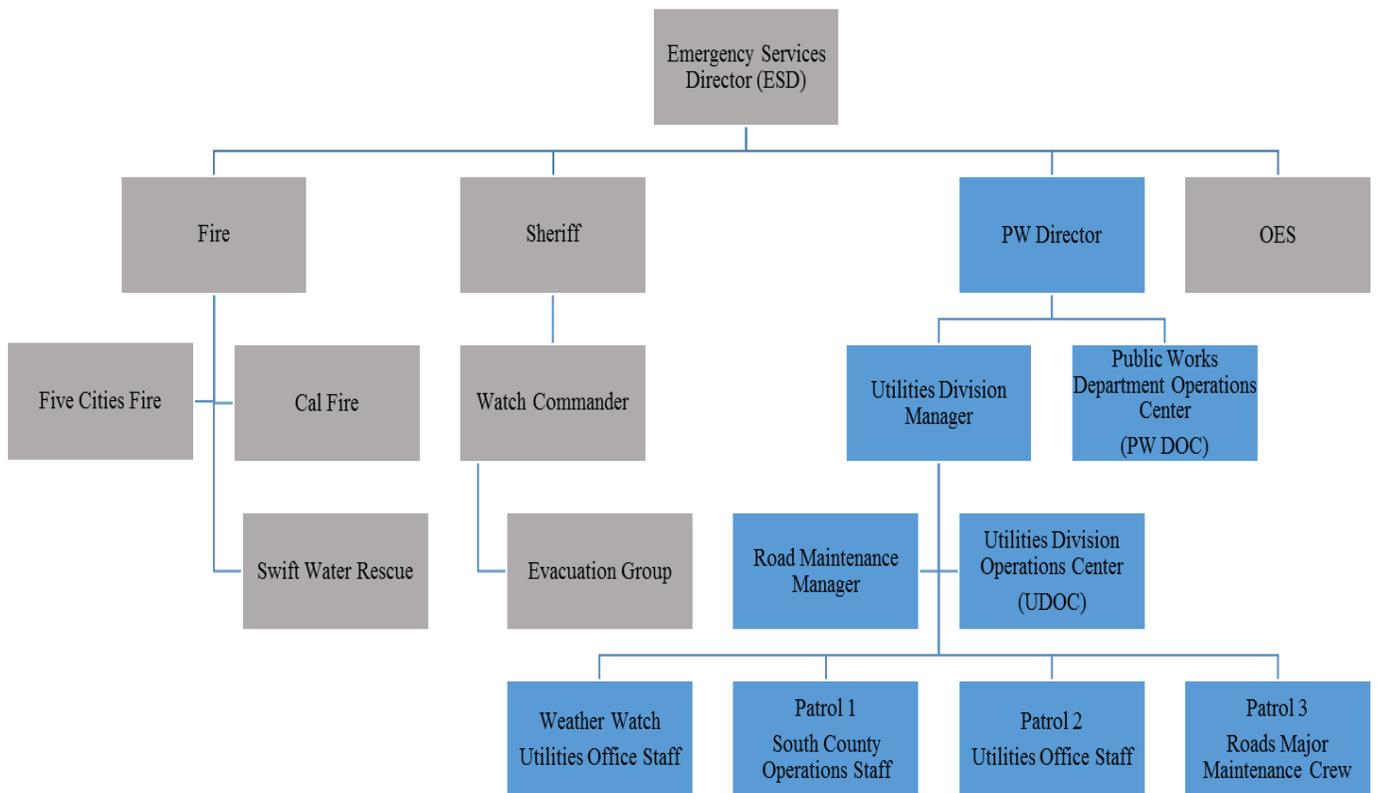


Figure 3: Patrol Area Overview

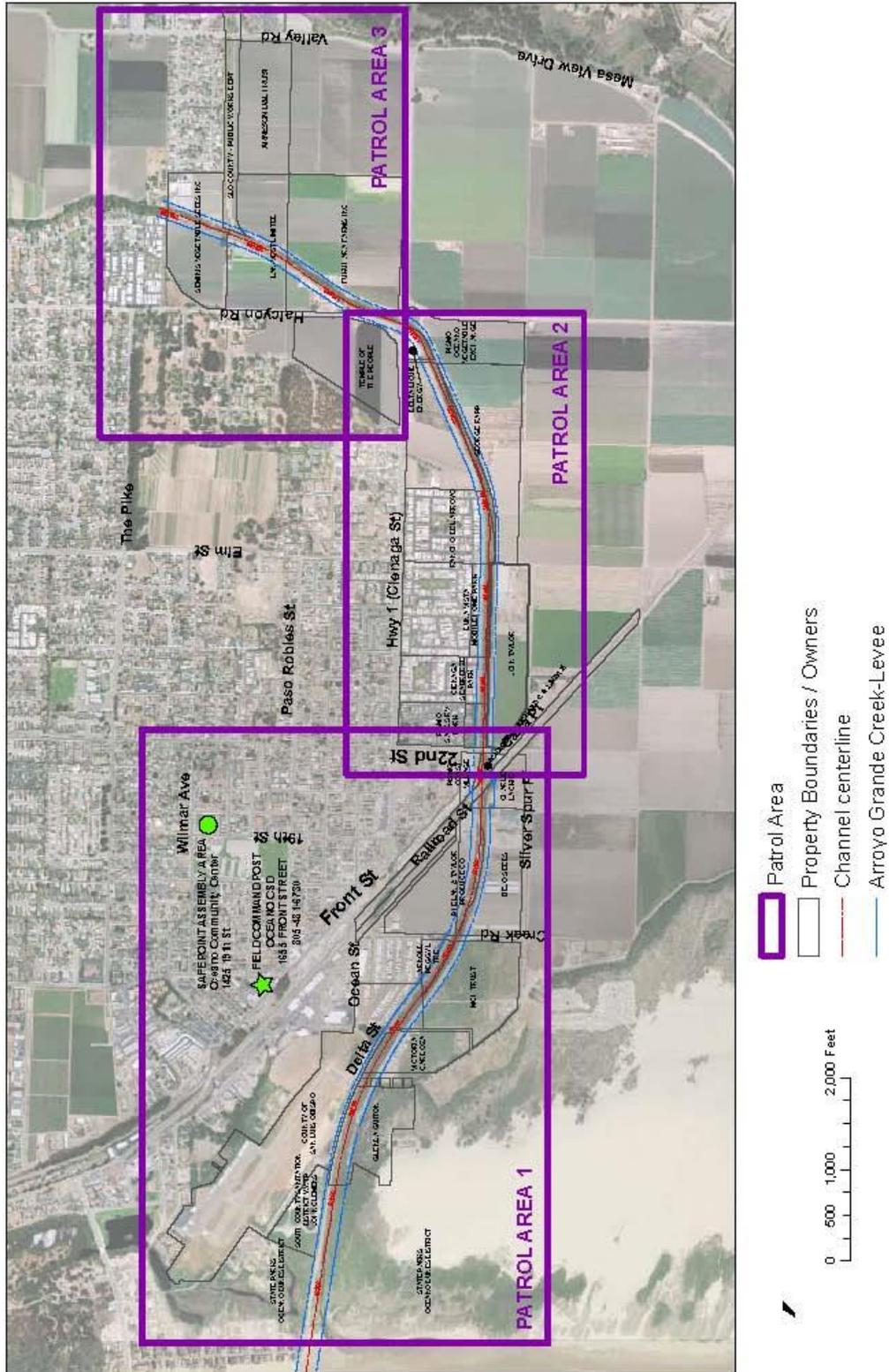


Figure 4: Patrol Area 1

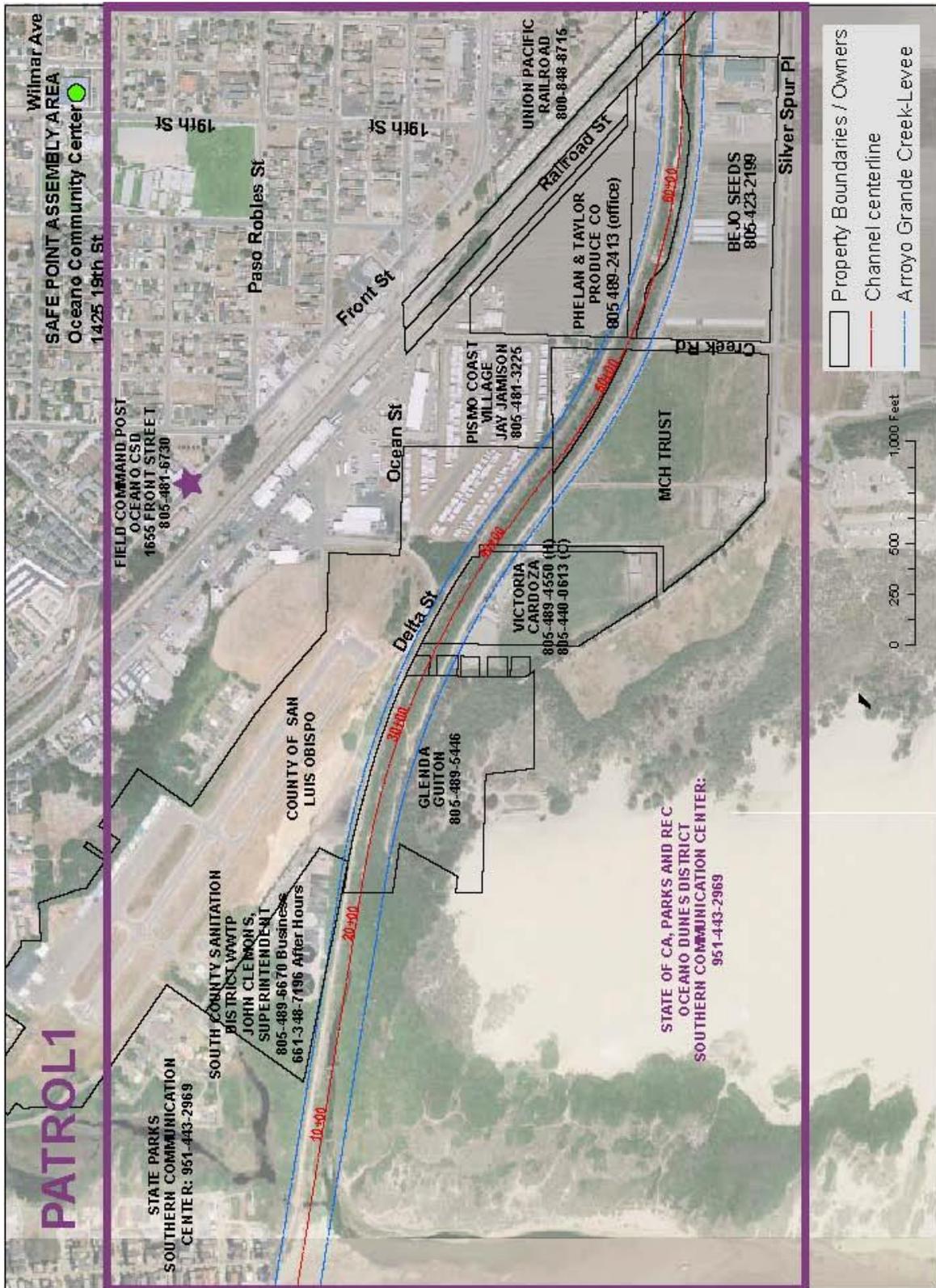


Figure 5: Patrol Area 2

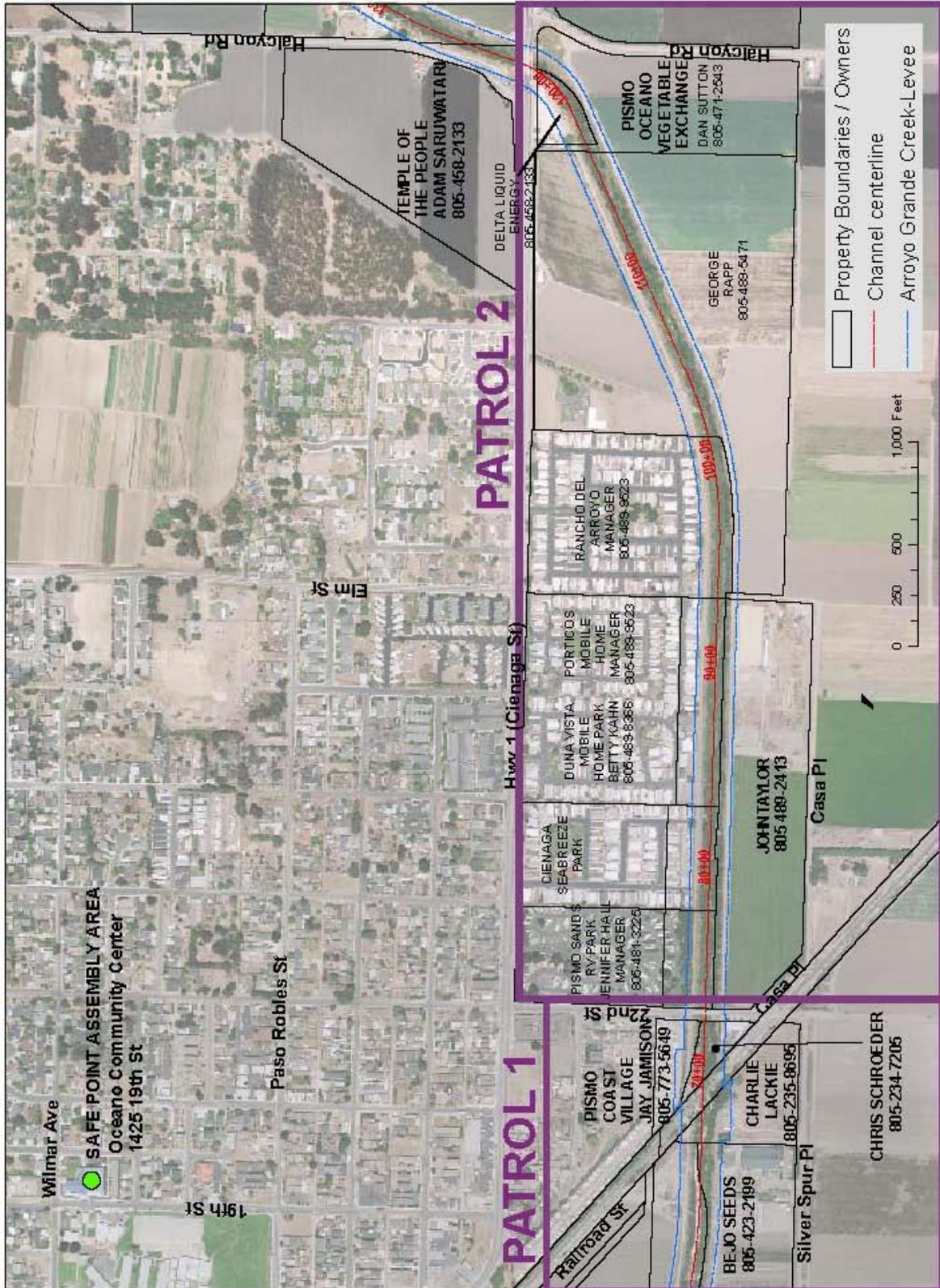


Figure 6: Patrol Area 3

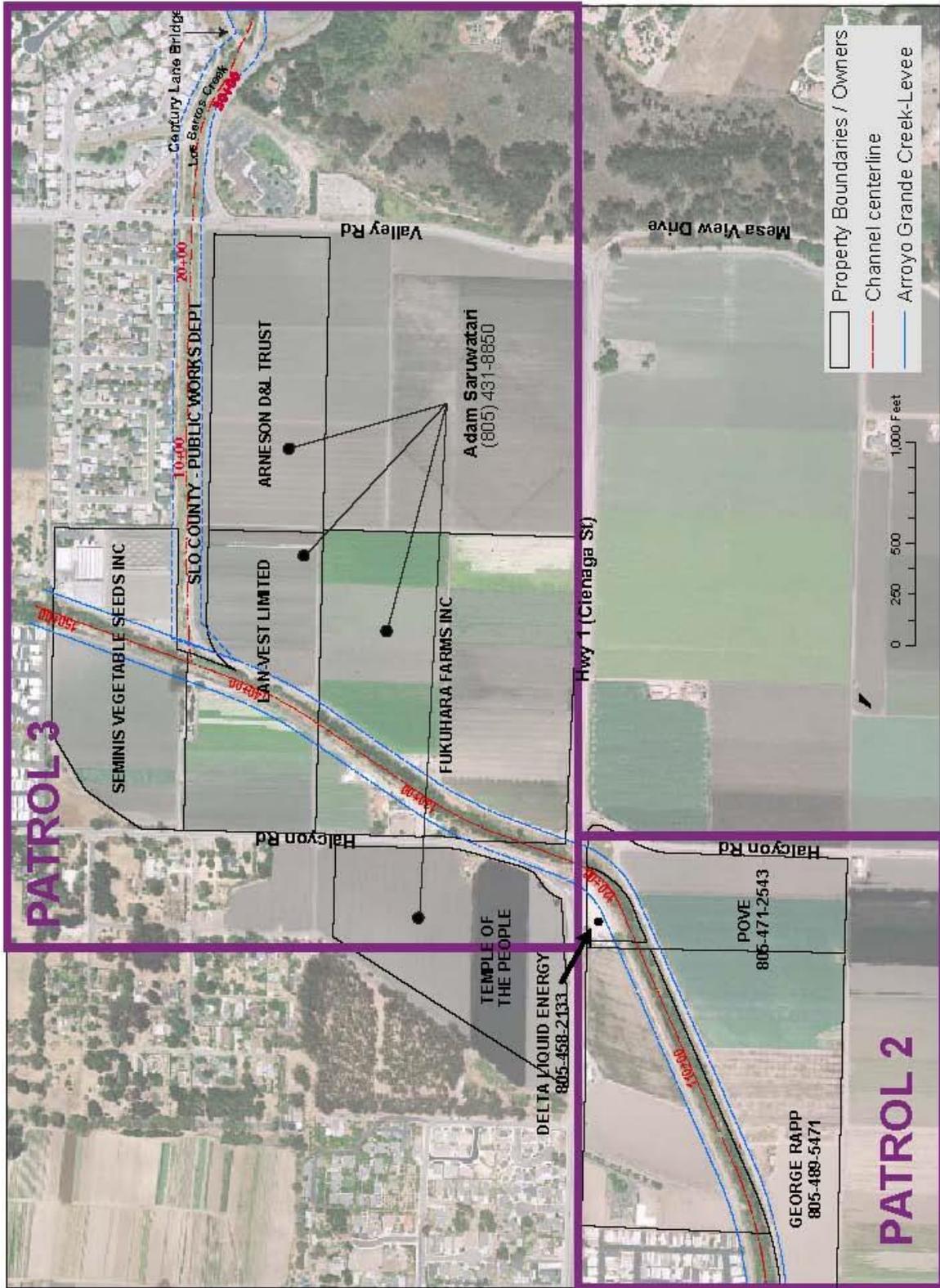


Figure 7: Levee System Facilities Map

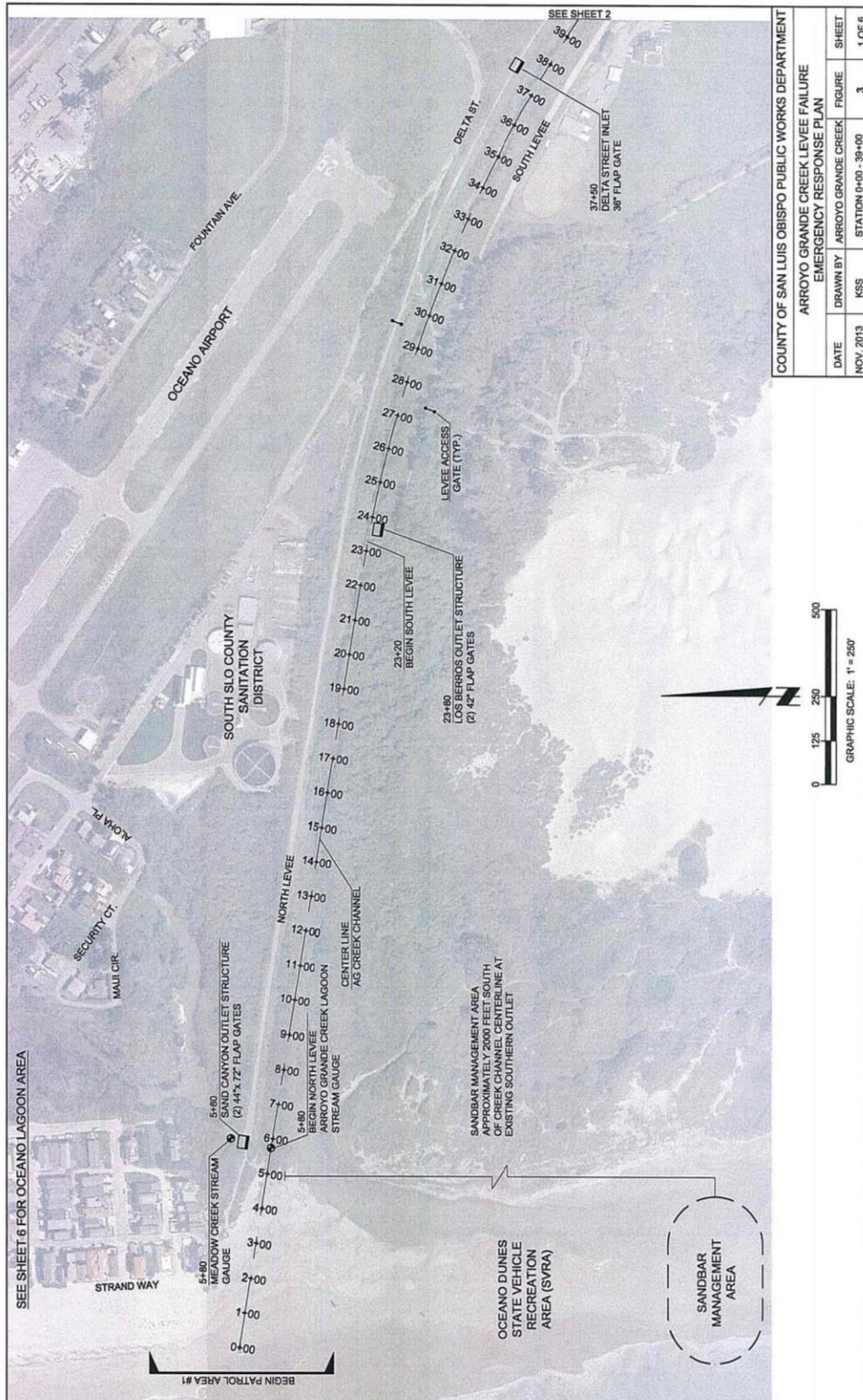


Figure 7: Levee System Facilities Map (2 of 6)



Figure 7: Levee System Facilities Map (4 of 6)

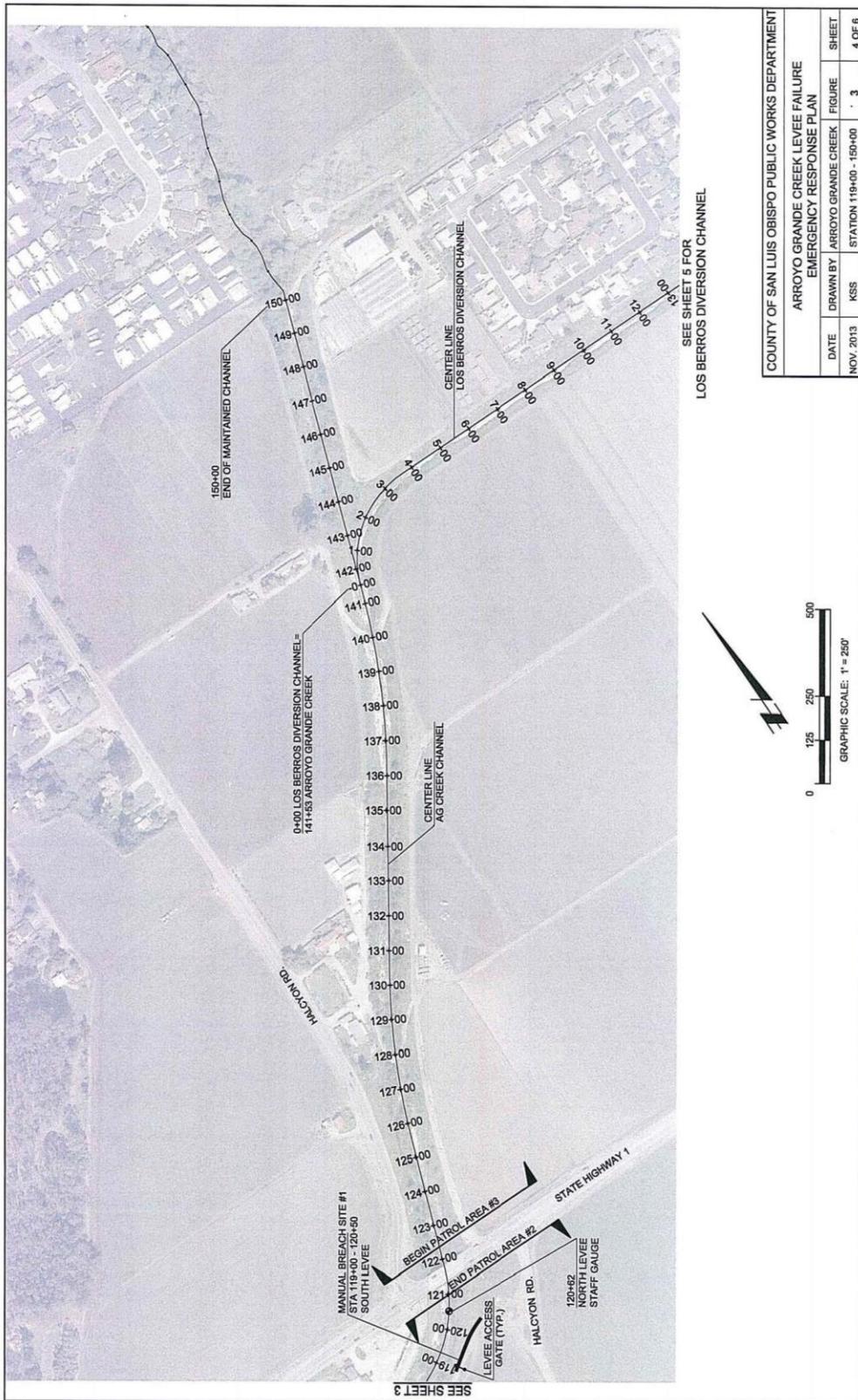


Figure 7: Levee System Facilities Map (5 of 6)



Figure 7: Levee System Facilities Map (6 of 6)

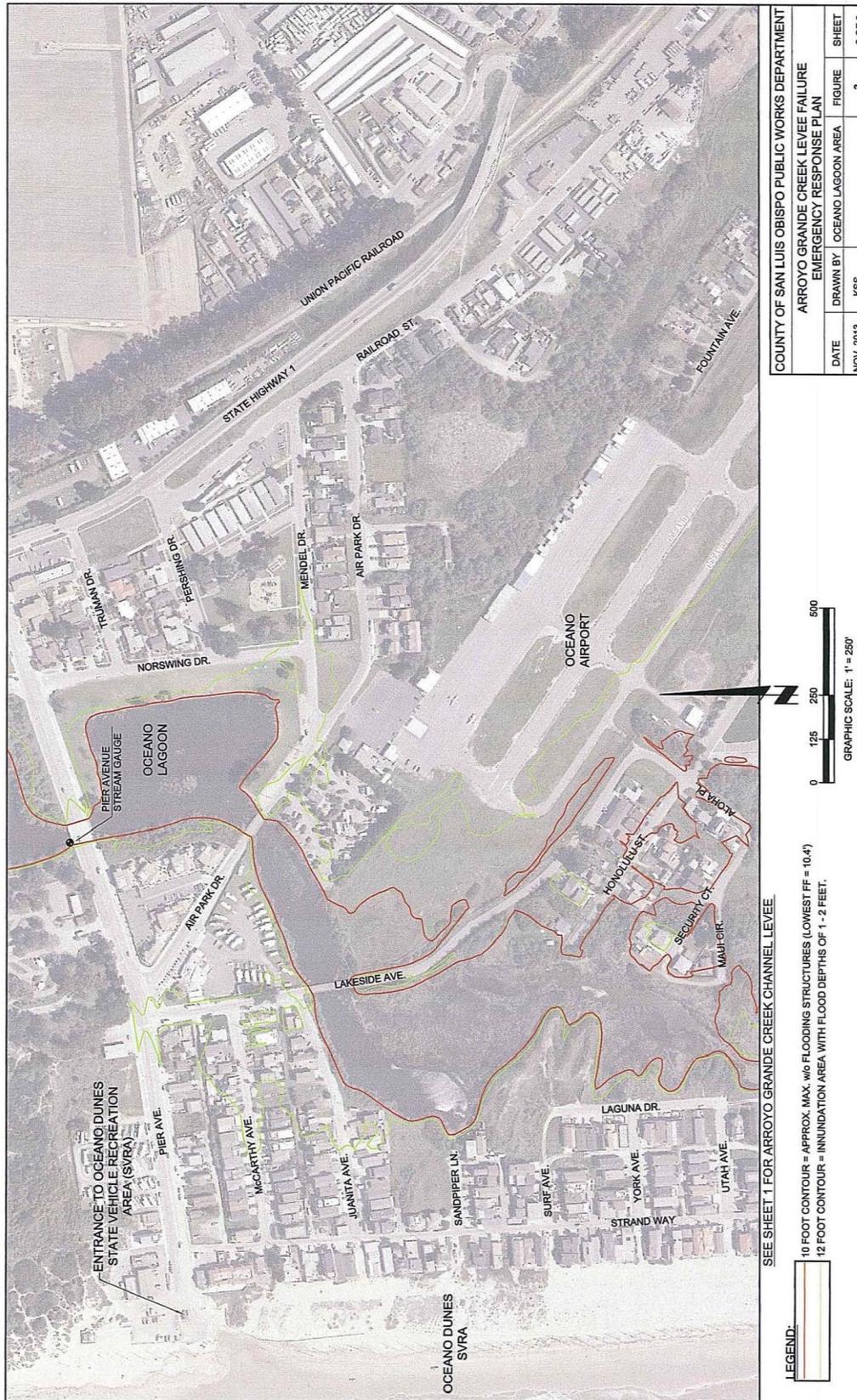
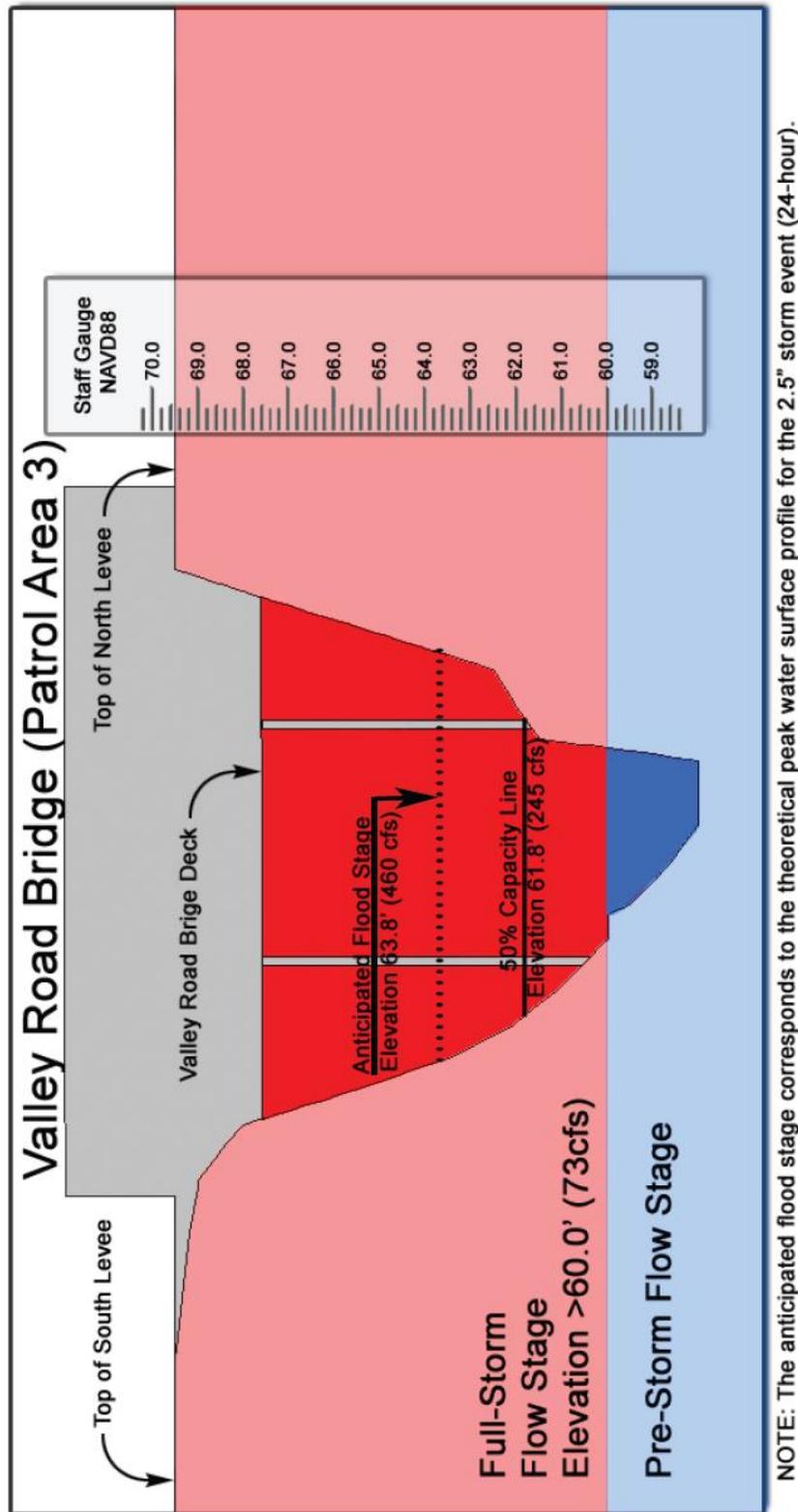


Figure 8: Storm Flow Stages at Valley Road Bridge, Los Berros Creek RS 24+00



**Figure 9: Storm Flow Stages at 22nd Street Bridge,
 Arroyo Grande Creek RS 73+00**

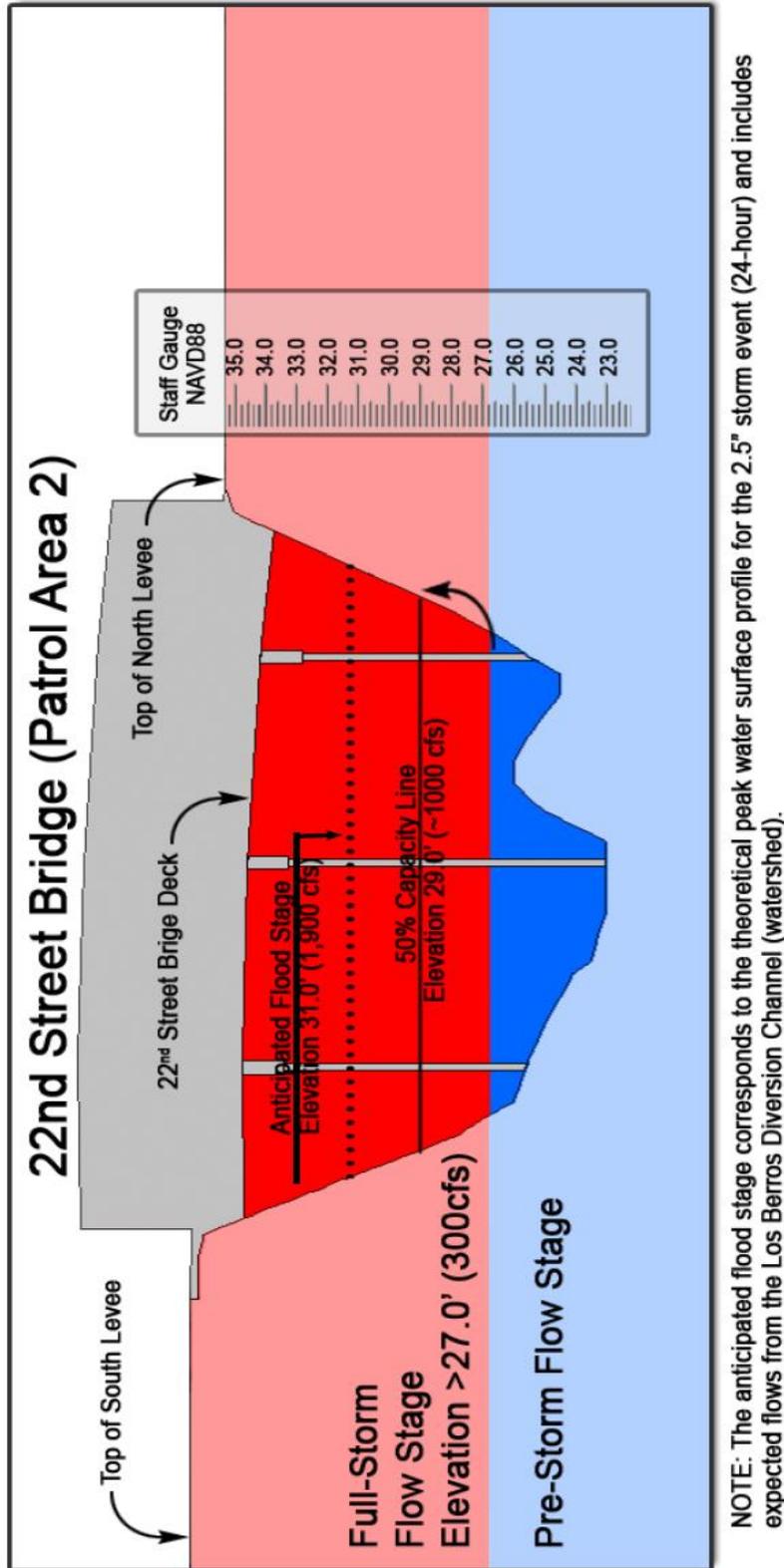
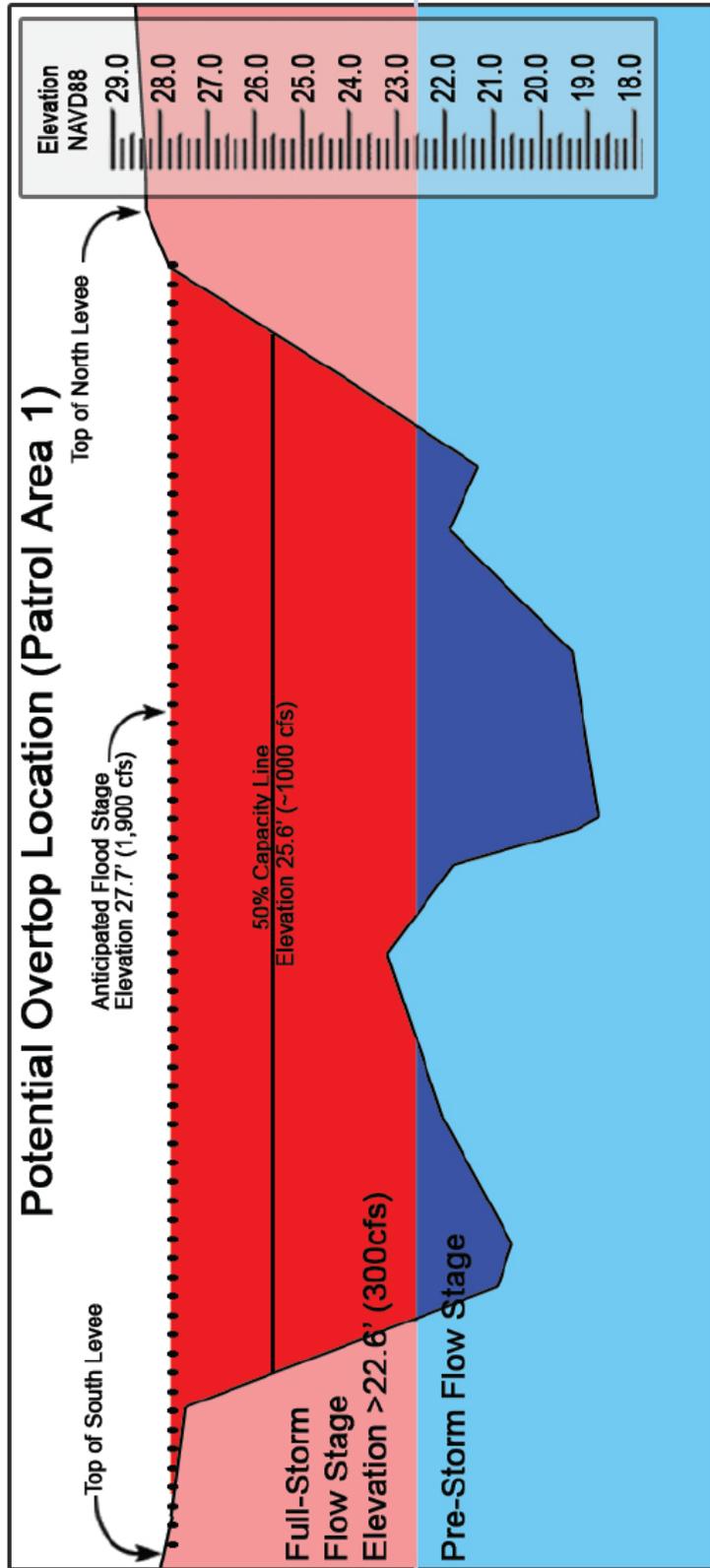
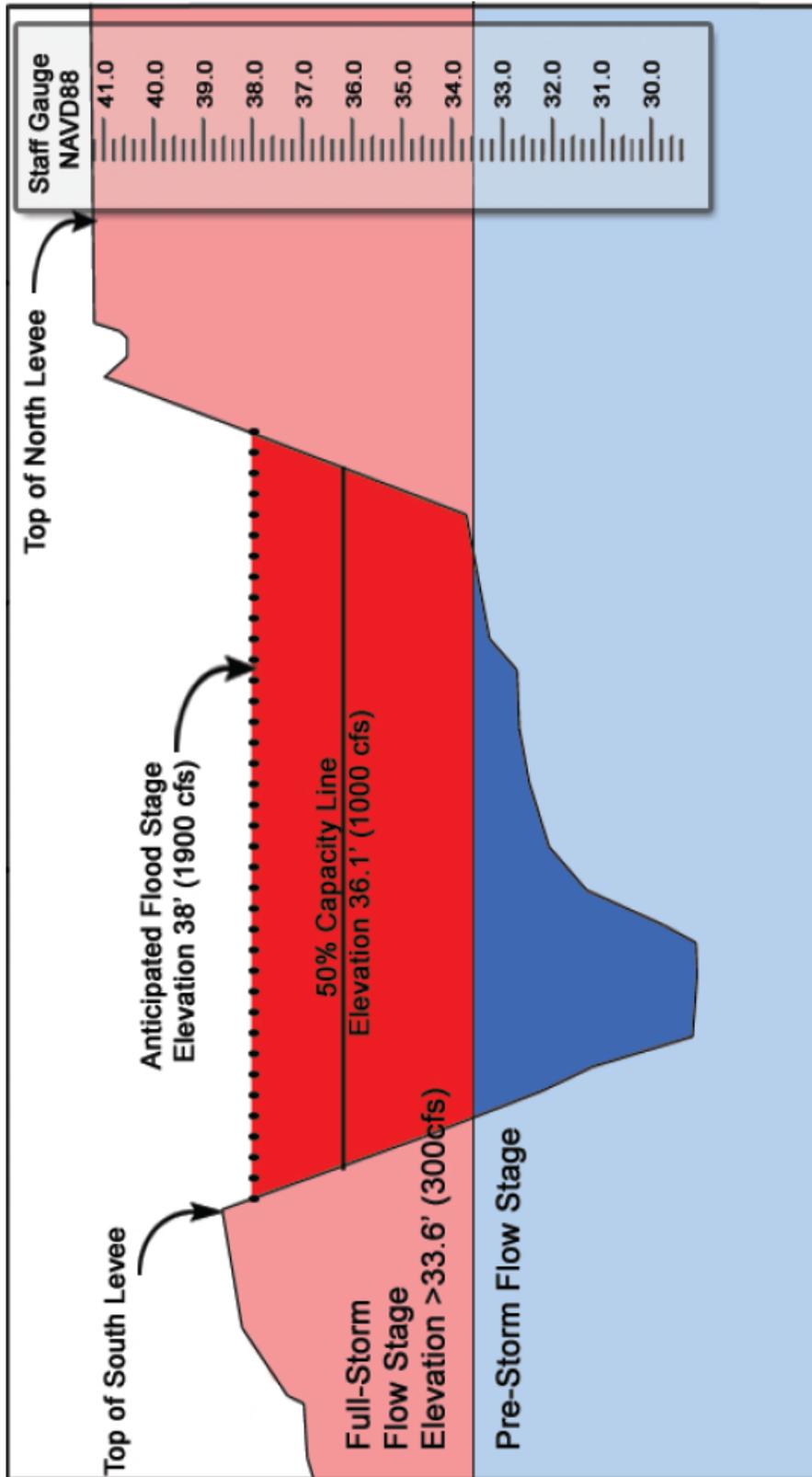


Figure 10: Storm Flow Stages at Arroyo Grande Creek RS 57+19



NOTE: The anticipated flood stage corresponds to the theoretical peak water surface profile for the 2.5" storm event (24-hour) and includes expected flows from the Los Berros Diversion Channel (watershed).

Figure 11: Storm Flow Stages at Low Point on South Levee RS 97+74



NOTE: The anticipated flood stage corresponds to the theoretical peak water surface profile for the 2.5" storm event (24-hour) and includes expected flows from the Los Berros Diversion Channel (watershed).

Figure 12: Storm Flow Stages at Arroyo Grande Creek RS 121+00

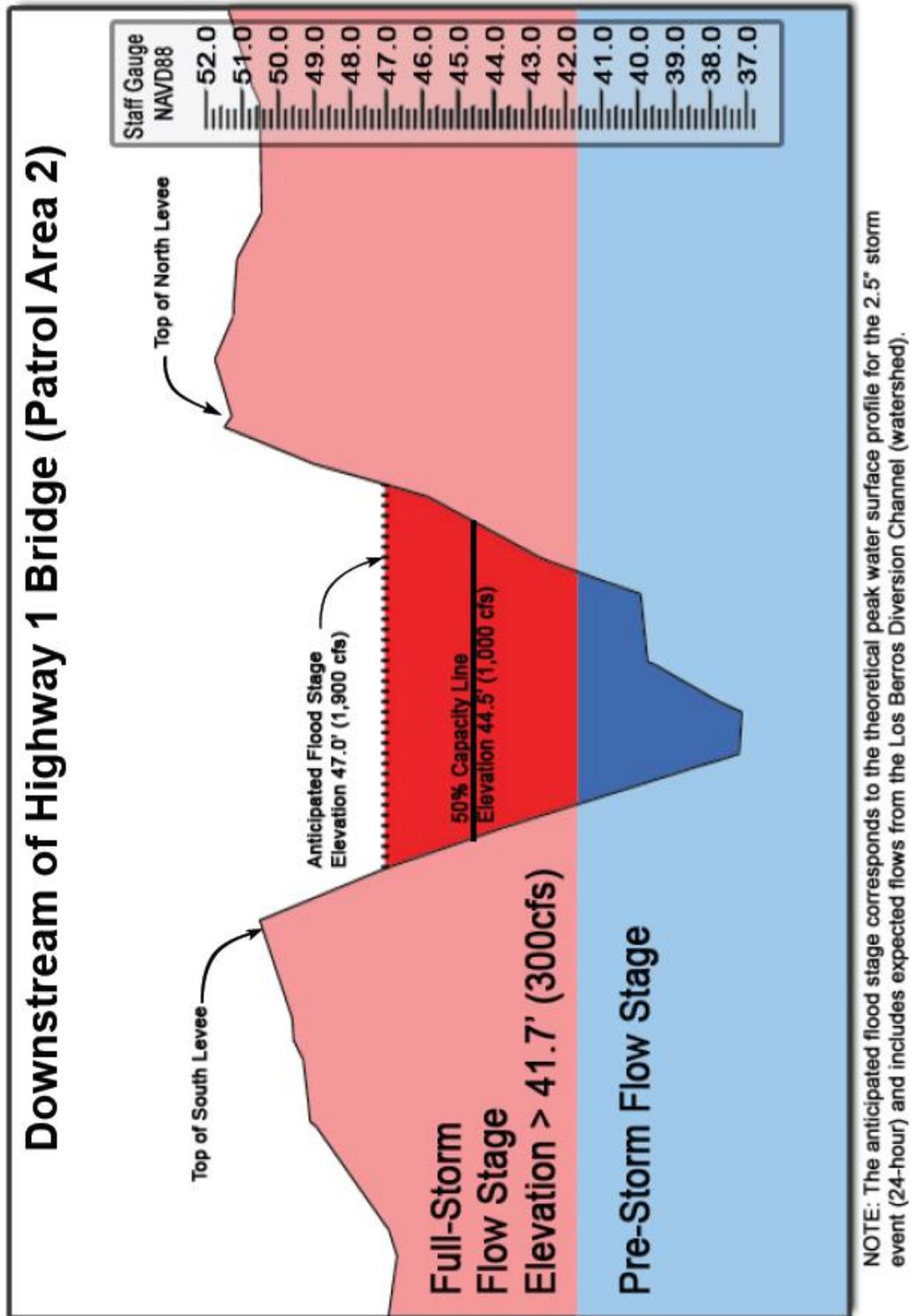


Figure 13: Storm Flow Stages at Arroyo Grande Creek Near the Confluence of Meadow Creek

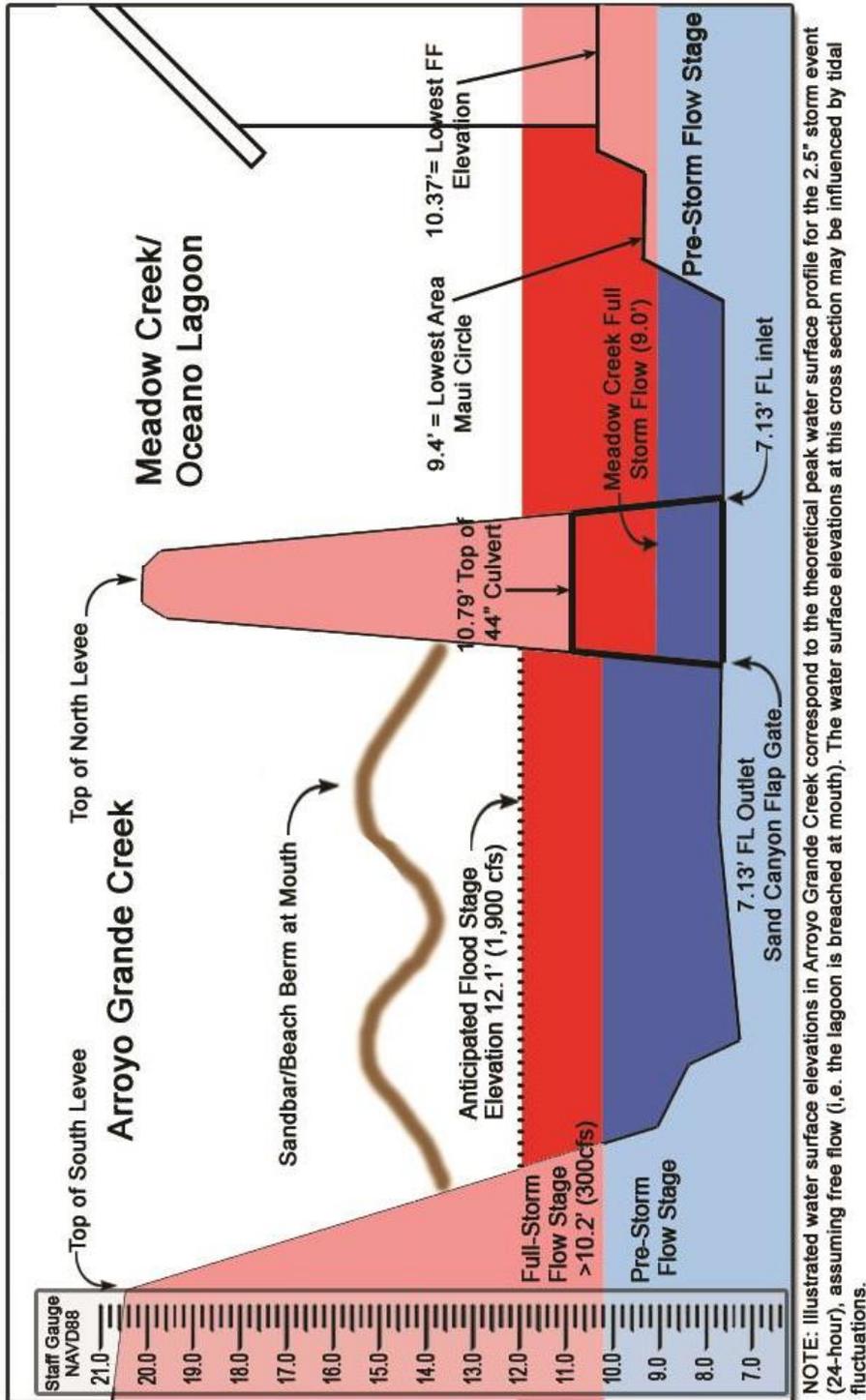


Figure 14: Storm Flow Stages at Arroyo Grande Creek at Arroyo Grande Station

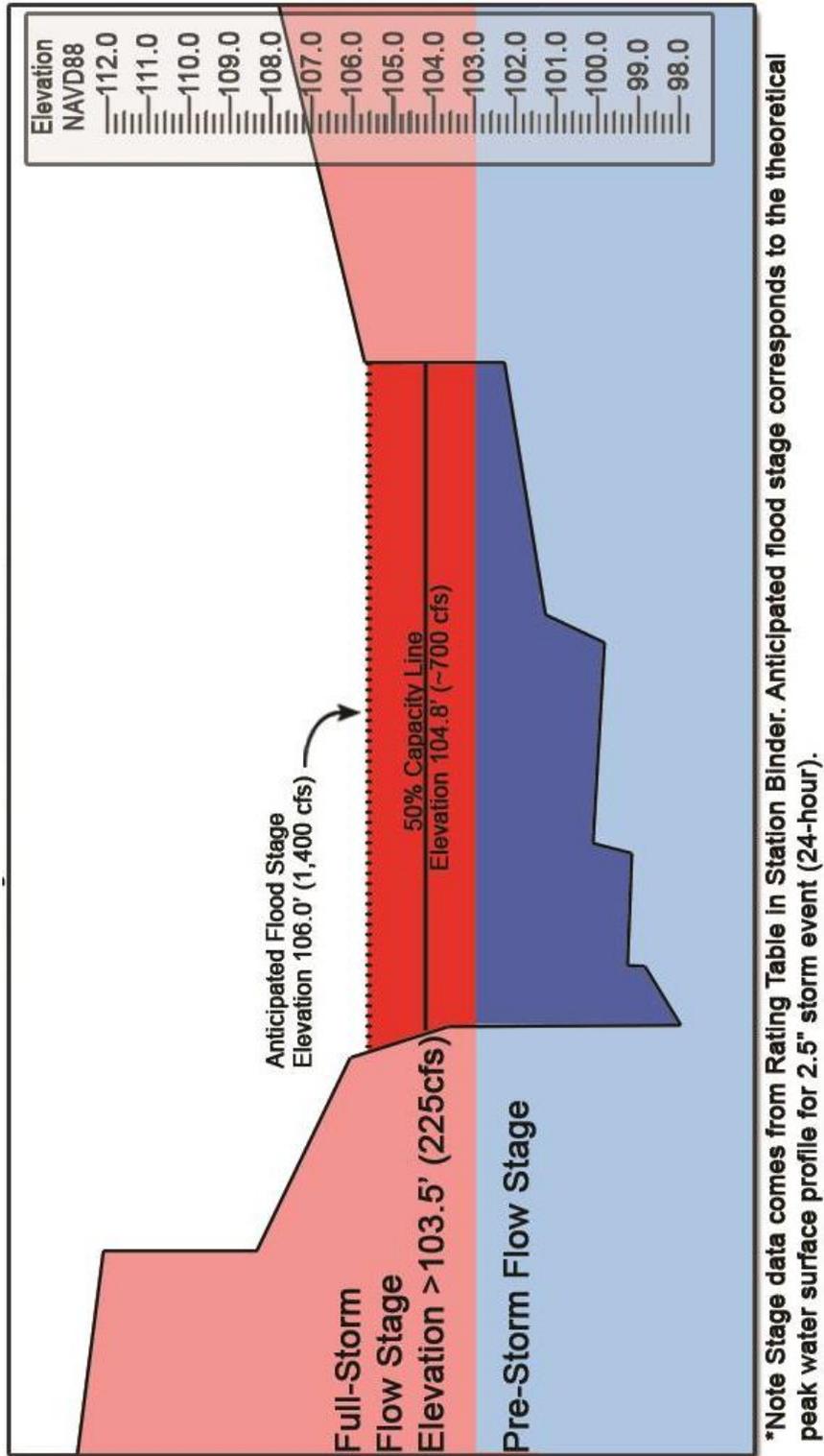
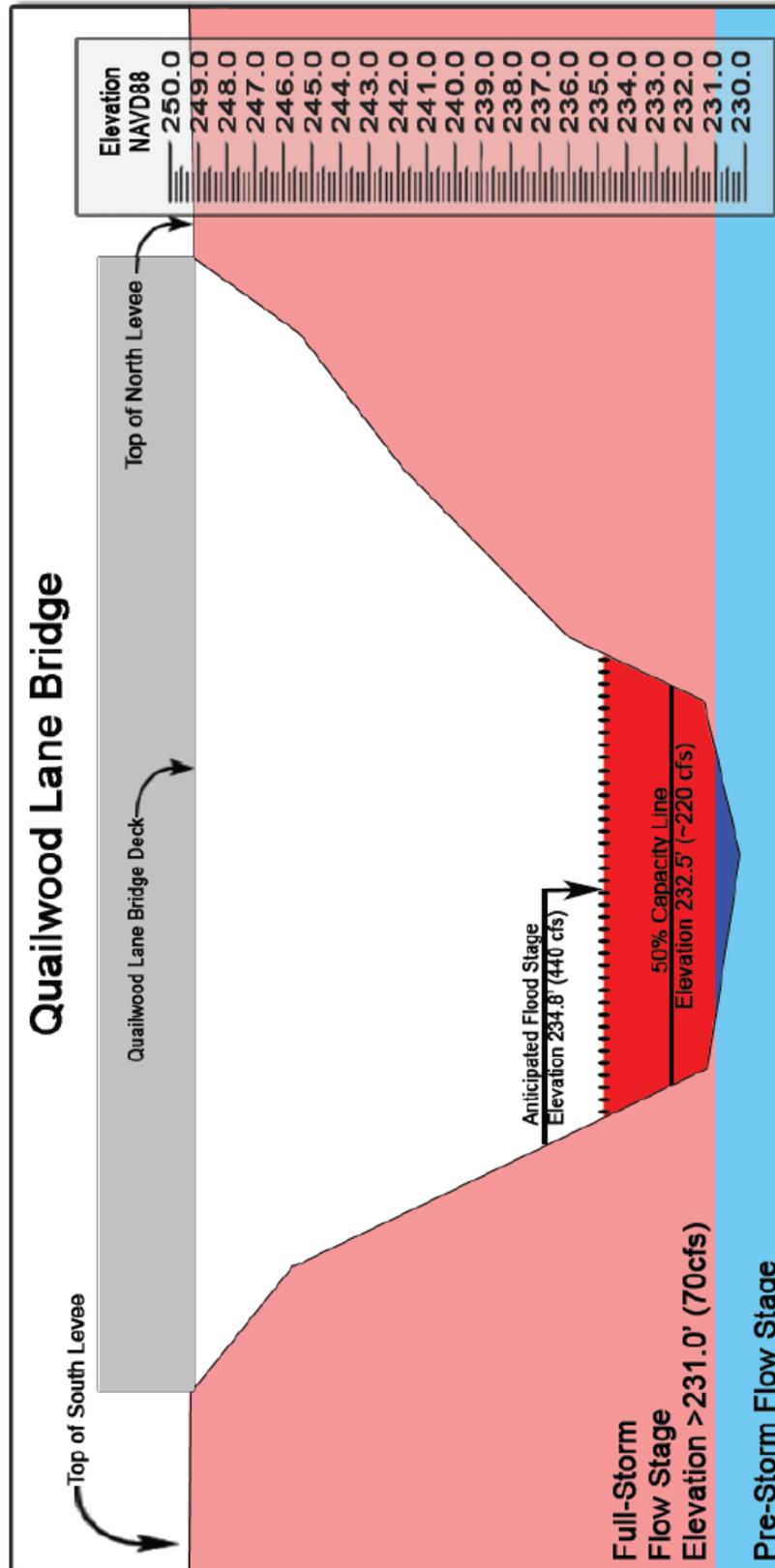


Figure 15: Storm Flow Stages at Los Berros Creek below Highway 101



NOTE: The anticipated flood stage corresponds to the theoretical peak water surface profile for the 2.5" storm event (24-hour).

Figure 16: Flood Evacuation Area

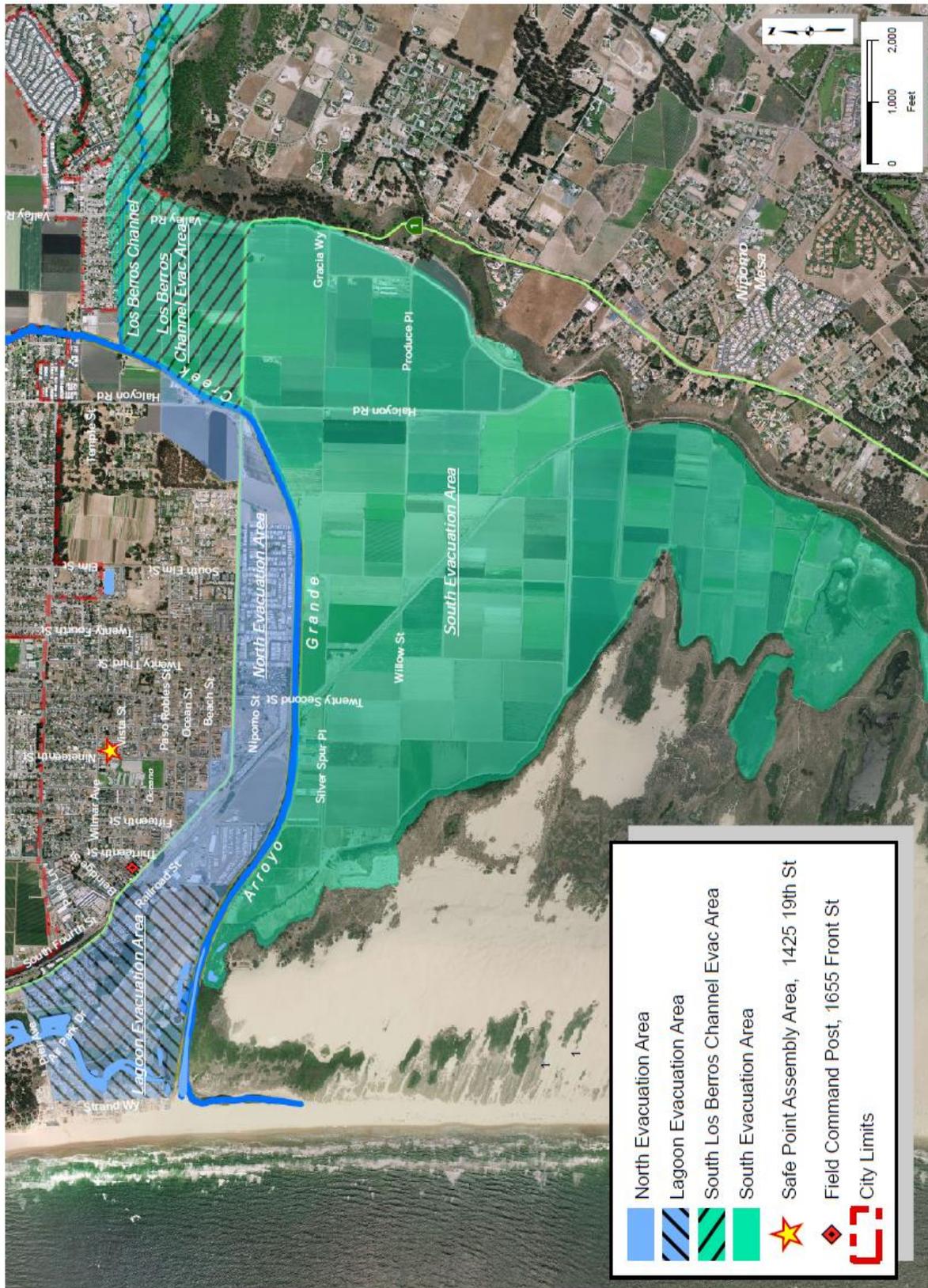


Figure 17: Flood Evacuation Area – North



Figure 18: Flood Evacuation Area – South

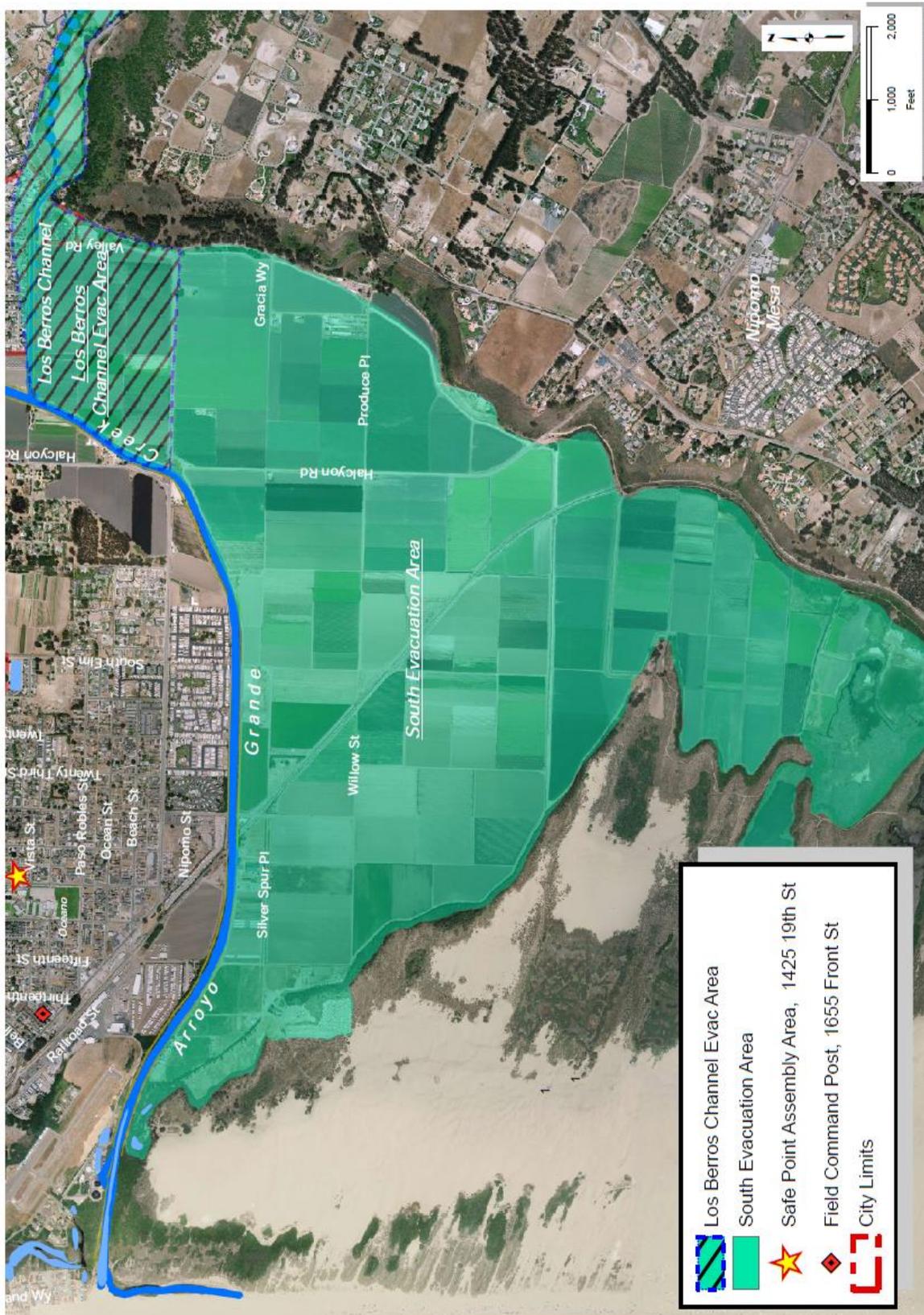


Figure 19: Manual Breach Location

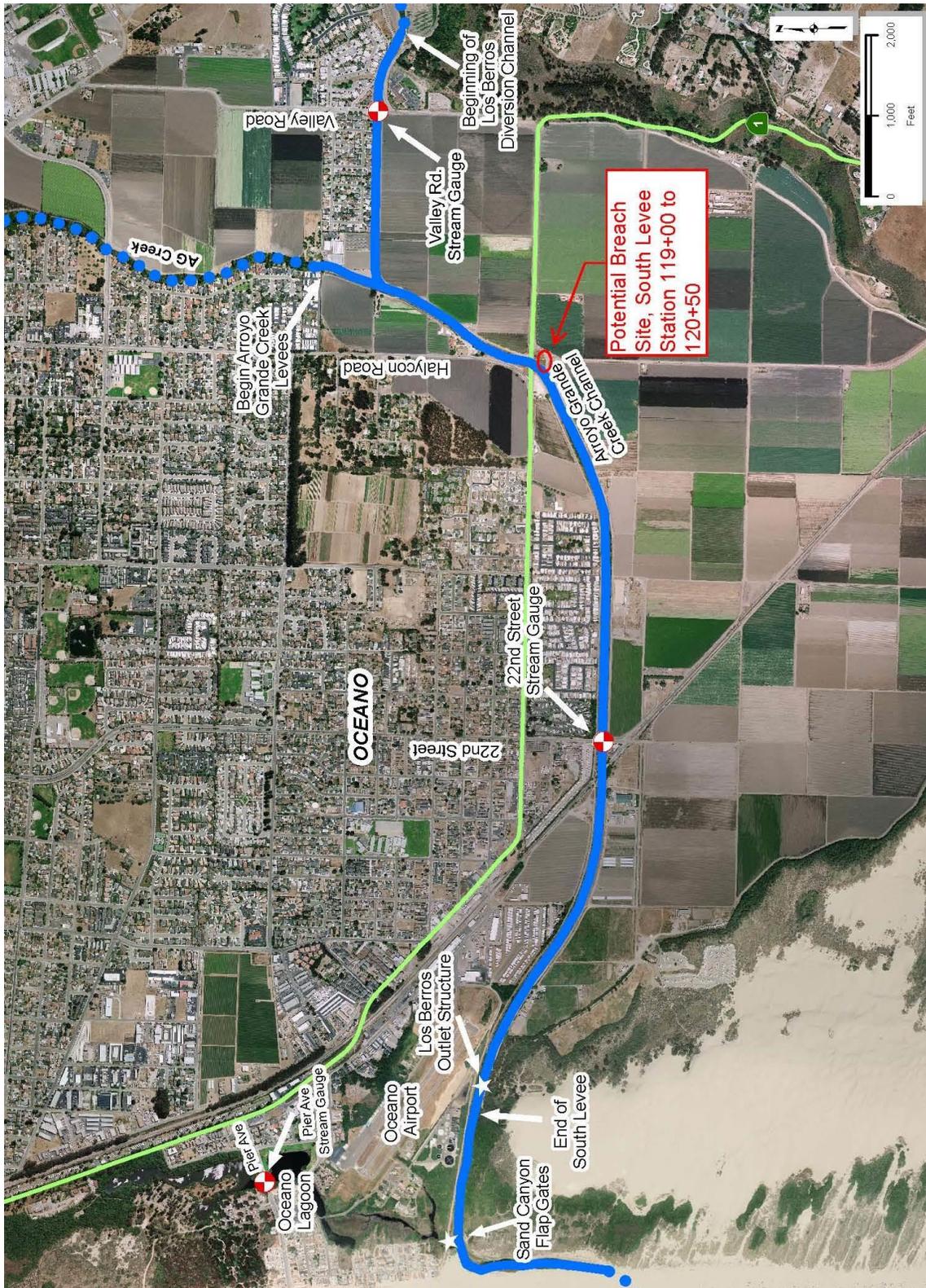


Figure 20: Manual Breach Staging Areas



TABLES

Table 1: Full Storm Flow Stage Creek Levels

Table 2: Post Storm Flow Stage Creek Levels

Table 1: Full Storm Flow Stage Creek Levels

Creek Channel	Gauge Site	Staff Gauge Reading (feet, NAVD88)		
		Full-Storm Flow WSE	~50% Capacity Storm Flow WSE	Anticipated Flood Flow WSE
Arroyo Grande	Arroyo Grande	103.5	104.8	106.0
Arroyo Grande	Hwy 1 RS 121+00	41.7	44.5	47.0
Arroyo Grande	RS 97+74	33.6	36.1	38.0
Arroyo Grande	RS 73+00, 22nd Street	27.0	29.0	31.0
Arroyo Grande	RS 57+19	22.6	25.6	27.7
Arroyo Grande	RS 5+80, Meadow Creek	10.2	11.2	12.2
Los Berros	Below Highway 101, Quailwood Lane	231.0	232.5	234.8
Los Berros	RS 24+00, Valley Road	60.0	61.8	63.8
Meadow Creek ^{2,3}	Meadow Creek (Sand Canyon Flap Gate)	9.0	NA	10.4
Meadow Creek ^{2,3}	Pier Avenue	9.0	NA	10.4

Notes:

RS = River Station

WSE = Water Surface Elevation

1. Full Storm Stage corresponds to the water surface profile when 300 cfs is flowing in channel. 50% Capacity Stage corresponds to the water surface profile when 1,000 cfs is flowing in channel. Anticipated Flood Stage corresponds to the water surface profile for when 1,900 cfs (2.5" storm event) is flowing in channel and is the expected capacity of the existing facility.
2. Meadow Creek Full Storm Flow Stage does not directly correspond to Full Storm Flow stage in Arroyo Grande Creek, i.e., Meadow Creek may be in Full Storm Flow Stage when Arroyo Grande Creek is not.
3. Meadow Creek Full Storm Flow Stage does not correspond to a storm flow volume; Full-Storm Flow and Anticipated Flood Flow water surface elevations are predetermined thresholds for when water surface elevations are approaching the lowest finish floor elevations (Full-Storm Flow) and when they have reached/exceeded the lowest finish floor elevations (Anticipated Flood Flow) in the Oceano Lagoon area.

Table 2: Post Storm Flow Stage Creek Levels

Creek Channel	Gauge Site	Staff Gauge Reading (feet, NAVD88)
		Post Storm Flow Stage <1,000 cfs (50% Capacity)
Arroyo Grande	RS 73+00, 22nd Street	29.0

Notes:

RS = River Station

PART THREE – APPENDICES

Appendix 1: Procedural Memorandum AD-18, Storm Emergency Operations

Appendix 2: Emergency Call Lists

Appendix 3: Radio Procedures and Call List

Appendix 4: Rates of Increase in Water Surface Elevation

Appendix 5: Available Equipment from Section 3 Yard

Appendix 6: Personal Safety Plan

Appendix 1: Procedural Memorandum AD-18, Storm Emergency Operations

Appendix 2: Emergency Call Lists

Appendix 3: Radio Procedures and Call List

Radio Basics



Step 1: Turn Radio On – Turn the far right button on.

Step 2: Turn to “BLACK” -Turn the far left button to select BLACK channel (will display on LCD Screen)

Step 3: Press and hold Push-to-Talk button wait one second, then speak message.

CHANNEL GUIDE

BLACK

County-wide communications for Public Works use; shared with other departments most notably are Sheriff Search and Rescue Team and County OES.

AMBER 1 / AMBER 2

Short-range car to car radio channels dedicated to Public Works. County Fire (CalFire) has been programmed into some radio units but as receive only; so Public Works can be aware of County Fire activities but cannot talk directly to County Fire on these channels.

Patrols (Field Units) – Recommended Practices



- Leave radio OFF when stored. Test radio and batteries monthly.
- Left knob (next to antenna) should always be set to 1 (BLACK 1).
- Always allow for “system set-up” time before talking. Give the system a ½ second set up time after pressing push-to-talk and prior to starting to talk **Key – Pause –Talk.**
- Microphone should be held directly in front of your mouth at about 3 inches. Talk loudly enough to be understood.
- Always assume UDOC is busy with multiple responsibilities. If you don’t receive immediate response, wait a few seconds and try again.
- Always wait for message confirmation before leaving your radio.
- Always speak clearly and distinctly about 3 inches from the front of the microphone. This is especially pertinent in the field when using a hand-held. The receiver (UDOC) requires your voice to override background distractions both at your location and at their location.

UDOC – Recommended Practices

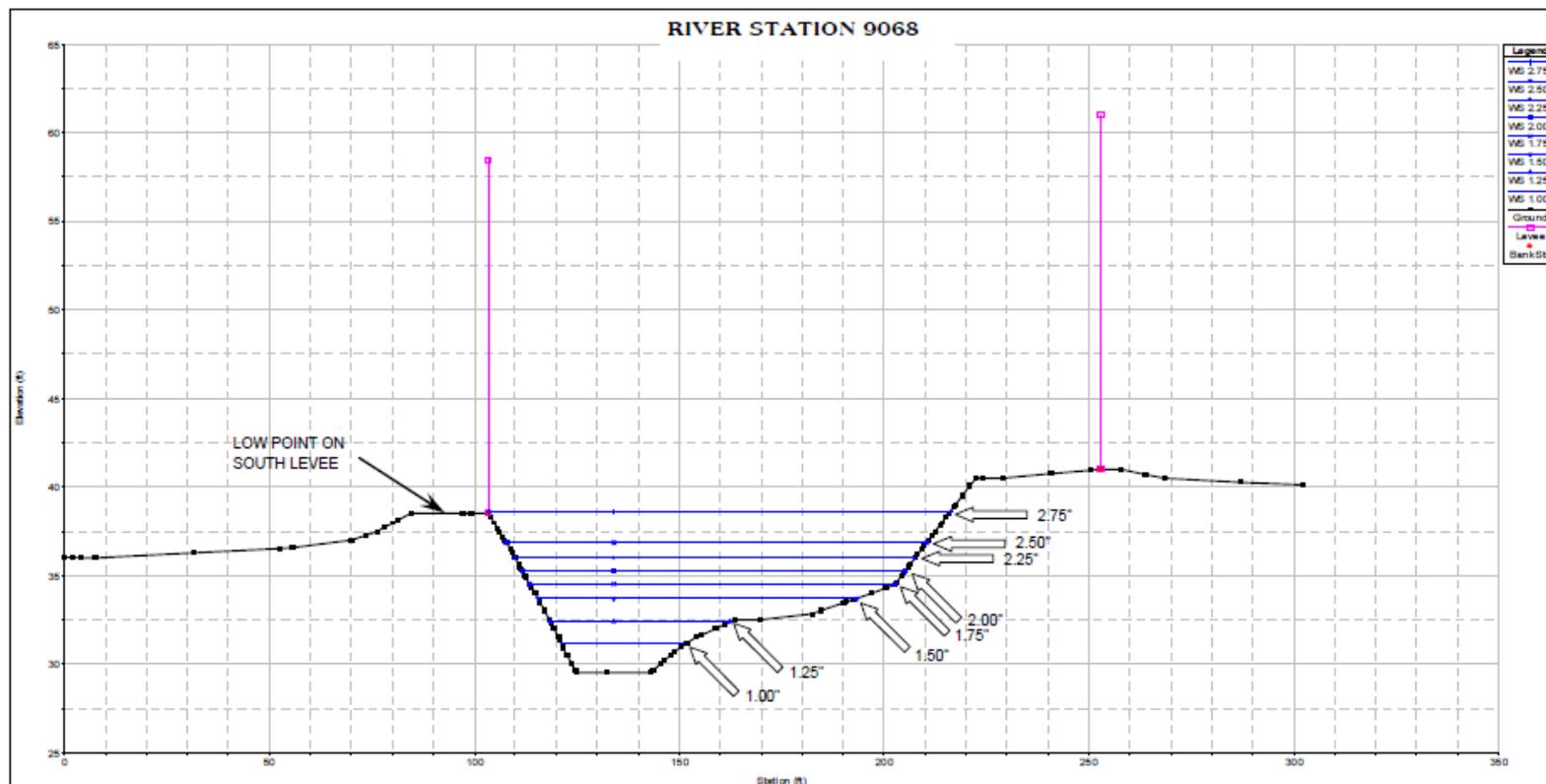


- Always assume the message is going to be received in a high noise environment. Deliver your message clearly and confidently each time. Project your speech into the microphone. Talk directly to your field unit. Remember that distracting background noises will interfere with the field unit understanding your message.
- Note that distracting background conversations or noises are often picked up along with intended traffic.
- Always conclude your transmission with the field unit’s name. Confirmation of message could be interpreted as confirmation to totally unrelated traffic from a different unit, especially if using BLACK channel.
- When you receive multiple, nearly simultaneous calls, take charge by advising calling units of multiple traffic....”I have received multiple calls, Patrol 1 (Joe), go ahead.” When you have concluded your communications with Joe, call for other units as needed.

Appendix 4: Anticipated Rates of Increase in Water Surface Elevation



WATER SURFACE LEVELS AT VARIOUS PRECIPITATION AMOUNTS OVER A 24-HOUR DURATION



Appendix 5: Available Equipment

List of Available Equipment

Equipment Available at Section 3:

Back hoe
Boom truck
Loader
Crane

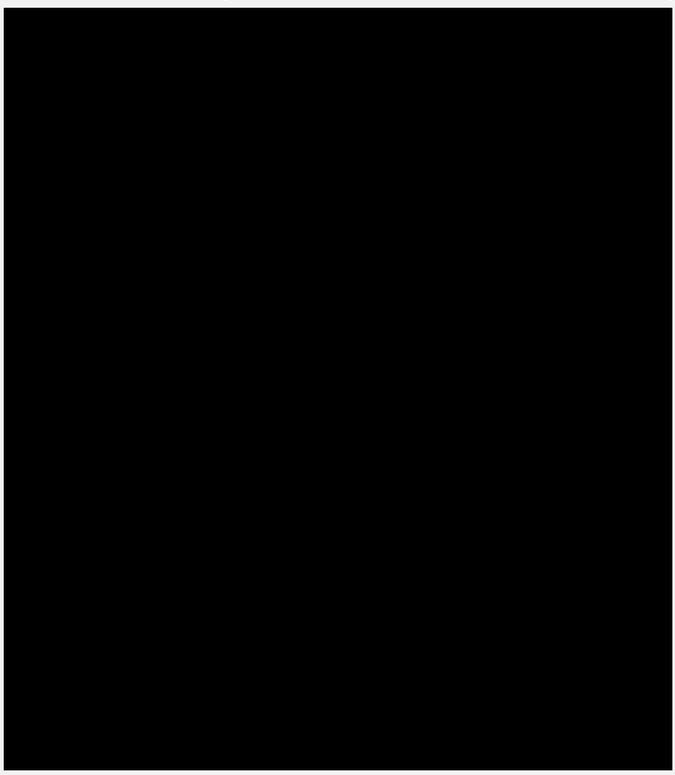
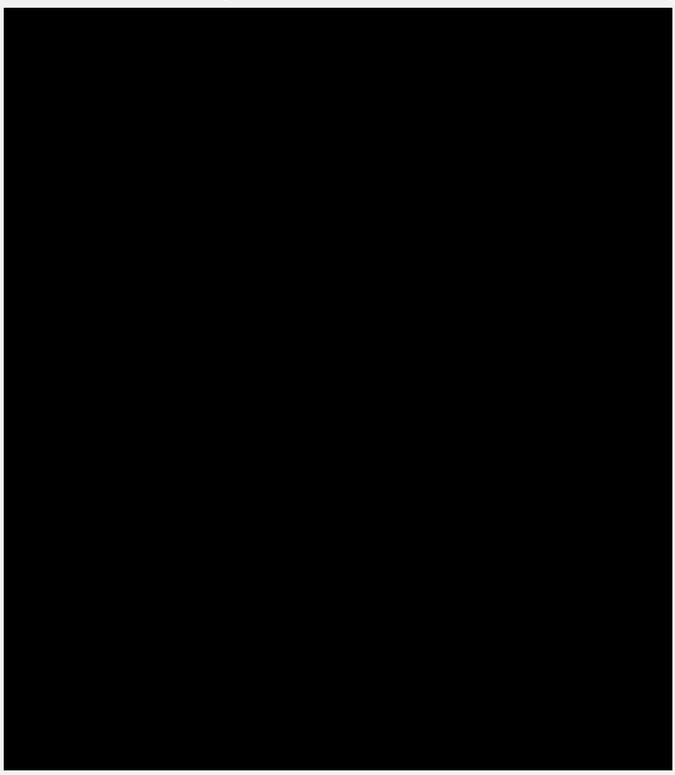
Equipment Available to Rent:

Operated Equipment is available to rent through the completed procurement process, **Bid 3674-14**. A list of available vendors, their blanket purchase order (PO), and contact information is included on the following page. Equipment rates, including standby rates, are attached to the POs available through SAP

Equipment is also available from:

United Rental SLO (Open weekdays only)

***There is an approximate lead time of 3 hours
to get equipment to the Arroyo Grande Creek area***

Bid 3674-14			
Name	Blanket PO#	Contact	Email
Mark Switzer Excavating	25009362		
Cal Portland Construction	25009359		
Papich Construction Co., Inc	25009364		
Ferravanti Grading & Paving	25009361		
R. Burke Corporation	25009366		
Winsor Construction Inc	25009367		
Pat Molnar General Engineering Inc	25009365		
Negranti Construction	25009363		
Viborg Sand & Gravel Inc	25009368		
David Crye General Engineering Contractor	25009360		

Appendix 6: Personal Safety Plan

Personal Safety Plan for Working in Arroyo Grande Creek Channel

Purpose

To reduce personal exposure to risks associated with working in Arroyo Grande Creek Channel.

Potential Hazards

- Driving on levees (unpaved dirt roads)
- Inspection of remote areas (inside and outside of channel)
- Maneuvering steep and changing terrain
- Hazardous Vegetation
- Insect Bites
- Working during stormy conditions (rain, wind, etc.)

Personal Protective Equipment/Clothing

All field personnel should dress appropriately while visiting or working in the channel. Personnel shall wear:

- Durable long pants and long sleeved clothing to protect from hazardous vegetation that is thorny or poisonous
- Closed toed, sturdy shoes such as boots or athletic shoes
- Sun protection (sunscreen, hat, etc), when appropriate
- Insect repellent, when appropriate
- County approved rain gear, when appropriate

Safety Action Plan

All field personnel are to exercise extreme caution when working in the vicinity of the flood control channel and levee system and are to avoid any situation which may place county personnel and/or equipment in danger. All field personnel should follow guidelines listed below:

Driving on levees (unpaved dirt roads)

1. Use a 4-wheel drive vehicle when driving on levee tops or dirt roads to access levee system.
2. If levees or dirt roads are saturated, avoid driving on them because they will be slippery and difficult to maneuver.

3. Personnel performing inspections on the levee tops during storm events should only drive on the levee tops if they are in a 4-wheel drive vehicle equipped with 2-way radio and conditions are safe.

Inspection of remote areas (inside and outside of channel)

4. All field personnel should work in pairs and implement the buddy-system while visiting and working at the channel.
5. Park vehicles at or nearby the planned work area and keep them locked.
6. Stay alert and be observant of your surroundings.
7. If there are individuals in the area that appear threatening or hostile, immediately leave the area, return to your vehicle and call authorities (Sheriff) if appropriate.
8. Do not return to the area where you encountered hostile person(s), until area is cleared by authorities.

Maneuvering steep and changing terrain

9. Choose your path into and out of channel area carefully to avoid injury. Pick existing walking trails, areas with less vegetation, and areas with little vertical change.
10. Avoid the need to climb and crawl into areas. When necessary to access locations, go the long way around if safest.

Hazardous vegetation

11. Learn to identify vegetation in the channel that may be hazardous, such as Stinging Nettle, Poison Oak, Blackberry, etc., and avoid contact.
12. Carry clippers to trim and cut back hazardous vegetation from your path when vegetation is too dense to avoid.

Insect bites

13. Avoid walking through dense vegetation where insects can drop and fall onto you.

Western Yellow Jacket (Yellow Jacket): A Yellow Jacket is a type of ground nesting wasp. They are a yellow and black flying insect that is capable of stinging multiple times.

14. If you see a Yellow Jacket and it is simply just foraging for food, do not attempt to deter it. Yellow Jackets are aggressive and may attack if you attempt to wave it away with sharp, sudden motions.
15. Watch for signs of lots of flying yellow insects emerging from a hole and be careful where you step because Yellow Jackets often nest in the ground. The Western Yellow Jacket prefer nesting in abandoned rodent holes or other cavities in the ground. In the Arroyo Grande Creek Channel, their nests are often encountered along the upper banks of the channel near the levee top where the ground is dry.

16. Yellow Jackets are protective of their nests and will attack an intruder in masse, often with little provocation. If you step onto a yellow jacket nest leave the area as quickly as possible and continue to get away from the area if the insects are swarming and following. Yellow Jackets will chase a perceived threat for large distances.

Working during stormy conditions

Stormy conditions will increase the risks associated with the potential hazards of Arroyo Grande Creek Channel.

17. Wear the County approved rain gear if required to work at the levee during stormy conditions.
18. Drive with care during stormy conditions. Do not drive onto levee tops if visibility is not good, levee conditions uncertain, or is unsafe for any other reason.
19. Stay alert and be observant of changing conditions (i.e., increasing rain, gusty winds, rising creek levels, etc.)
20. Remain within sight distance of buddy (co-worker) and communicate often regarding any changes in conditions. Check in with office (UDOC) often (minimum of every 30 minutes) and when appropriate.
21. Do not enter the channel when creek flows are high (water is deep).
22. Watch for broken limbs and falling trees while walking or driving along the levee.

Accident Reporting

Per Public Works Procedural Memorandum SA-3, incidents need to be reported to the direct supervisor within 24 hours of the event. The direct supervisor will assure the report is processed through the administrative services division to the County Risk Management in that time period.

To report workplace injuries or illness:

- a. Employee
 - i. Immediately report accident/event to your supervisor. The employee must complete an Employee Report of Occupational Injury or Illness.
 1. The Employee Report of Occupational Injury or Illness must be submitted to Risk Management within 24 hours.
 2. If the injured employee is unable or refuses to complete the form, the supervisor shall submit the report with the available information available. Supervisor's Investigation Report must be submitted within 48 hours.

- ii. If injury or illness requires medical attention, seek medical care. Notify supervisor of physician utilized and any restrictions placed on your job duties.
- iii. A physician's release to return to work is required for any absences of more than three (3) days. Notify your supervisor of any restrictions placed on your job duties.