

EMERGENCY ACTION PLAN (EAP)

FOR

SAN JOAQUIN RESERVOIR DAM ORANGE COUNTY, CALIFORNIA

2350 Ford Road

Newport Beach, CA 92660

Latitude: 33.6201; Longitude: -117.8433



DAM OWNER: IRVINE RANCH WATER DISTRICT

DSOD SOUTH REGION

DSOD DAM No. 1029.000

NATIONAL INVENTORY OF DAMS (NID) No. CA00853

FEDERAL ENERGY REGULATORY COMMISSION (FERC) No. N/A

Public Copy

Date Prepared: March 30, 2026
Prepared By: Stetson Engineers Inc. (760) 730-0701

HAZARD



CLASSIFICATION

Phone numbers and email addresses have been removed from this publicly posted copy of this Emergency Action Plan. That information is available from Irvine Ranch Water District's district secretary: Phone 949-453-5300, Email Comments@IRWD.com

Dam Contact Information

San Joaquin Reservoir Dam

2350 Ford Road

Newport Beach, CA 92660

(33.6201, -117.8433)

24-Hour Emergency Contact:

Jose Zepeda, IRWD Director of Water and Recycling Operations

Dam Owner:

Irvine Ranch Water District

Contact: Paul Cook, P.E., General Manager

Dam Operator:

Bryan Clinton, IRWD Operations Manager

Dam Safety Engineer:

Jacob Moeder, IRWD Engineering Manager

EAP Coordinator:

Steve Choi, IRWD Director of Safety and Security

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Key Dam Information

Dam Description

Height:	224 feet	DSOD #:	1029.000
Year Built:	1966	NID #:	CA00853
Dam Operator:	IRWD	Hazard Classification:	Extremely High
Property Owner:	IRWD		



Potential Impacted Area

The San Joaquin Reservoir Dam is located at the north end of San Joaquin Reservoir, at the end of Ford Road in Newport Beach, CA. The area near the dam is hilly, with elevations ranging from 500 feet at the reservoir to sea level at Newport Beach Harbor. If the San Joaquin Reservoir Dam were to fail, parts of the City of Irvine and the City of Newport Beach would flood.

Directions to San Joaquin Dam

In order to access the San Joaquin Reservoir Dam from Pacific Coast Highway, turn north onto Macarthur Boulevard, and follow it for roughly two miles until Bonita Canyon Drive. Head east on Bonita Canyon Drive for about three-quarters of a mile. Turn right on Prairie Road then left onto Ford Road. The access road for the dam is located at the east end of Ford Road. The address that can be used to find the dam access road is 2350 Ford Road, Newport Beach, CA 92660.

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PART I: EAP INFORMATION

Section 1: Introduction

1.1 Background

Irvine Ranch Water District (IRWD) is an independent special district that serves 447,000 residential customers in central Orange County, CA. IRWD owns and operates five jurisdictional dams, one of which is at the San Joaquin Reservoir Dam. The San Joaquin Reservoir Dam is located in Orange County, CA in the City of Newport Beach. The dam has two drop inlets located on the north side which act as overflow structures, and are not considered critical appurtenant structures by California's Division of Safety of Dams (DSOD). The drainage area upstream of the dam is 0.4 square miles, but the dam does not collect natural runoff. San Joaquin Reservoir stores recycled water from IRWD's Michelson Water Recycling Plant (MWRP).

The dam at San Joaquin Reservoir is a zoned rockfill embankment dam originally constructed in 1966. The California State Dam Number is 1029.000 and the National Dam Number is CA00853. The dam has two drop inlets which function as spillway structures. The drop inlets are connected to a conduit which conveys water to an energy dissipation box located in the stream channel downstream of the dam. In addition to the drop structures, San Joaquin Reservoir Dam has a 60-inch conduit which runs through the dam and acts as both inlet and outlet.

The dam is located in the San Diego Creek watershed in coastal hills about three miles inland from the Pacific Ocean. Topography in the area is hilly, with elevations ranging from about 500 feet at the reservoir to sea level at Newport Beach Harbor. Flooding from a failure at San Joaquin Reservoir Dam has the potential to inundate portions of the following communities:

- City of Newport Beach
- City of Irvine

Figure 1-1 shows the location of San Joaquin Reservoir Dam and the above listed communities. The dam impounds the reservoir along an unnamed creek, which is tributary to Bonita Creek. The drainage area upstream of the San Joaquin Reservoir is 0.4 square miles. Bonita Creek drains a total area of 5.4 square miles. Bonita Creek flows north within the City of Newport Beach, near the border with the City of Irvine. Near the intersection of University Drive and Highway 73, Bonita Creek joins San Diego Creek. San Diego Creek then flows through a short reach before flowing into Upper Newport Bay. The total drainage area of Newport Bay is about 150 square miles. San Diego Creek, at its point of discharge to Newport Bay, drains about 120 square miles. Newport Bay is a large estuary and harbor which is influenced by ocean tides.

Document Path: J:\jn2478\IRWD_San_Joaquin_Dam_Overview_figure.mxd

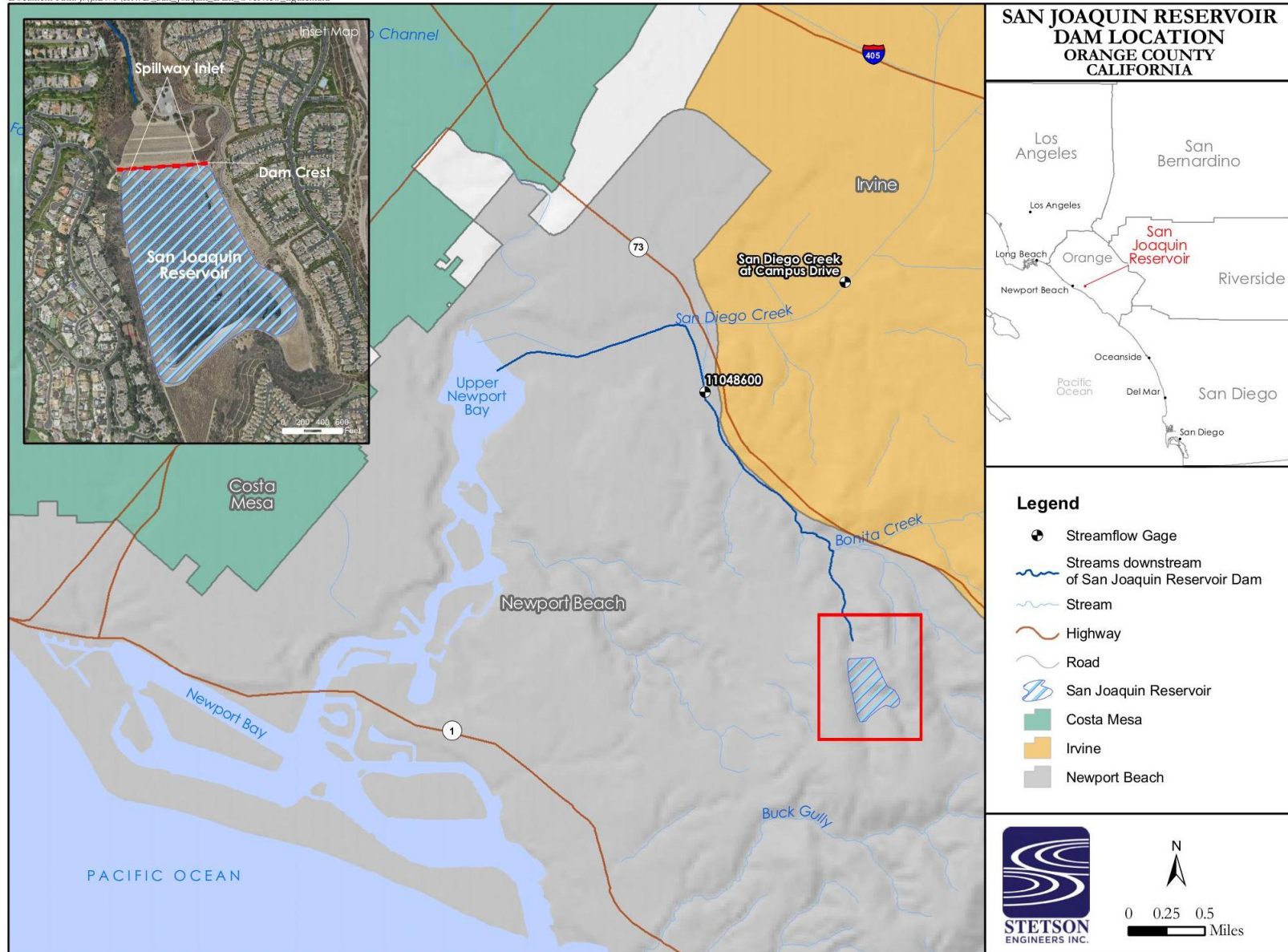


Figure 1-1 San Joaquin Reservoir Area Overview



Figure 1-2 San Joaquin Reservoir Vicinity Map

1.2 Purpose

A dam safety incident is an impending or actual sudden uncontrolled release or excessive controlled release of water from an impounding structure. The release may be caused by damage to or failure of the structure, flood conditions unrelated to failure, or any condition that may affect the safe operation of the dam. The release of water may or may not endanger human life, downstream property, or the operation of the structure. When people live in an area that could be affected by the operation or failure of a dam, there is the potential for an emergency related to a dam safety incident. The National Incident Management System (NIMS) defines an emergency as “any incident, whether natural or manmade, that requires responsive action to protect life or property.”¹

The purpose of this Emergency Action Plan (EAP) is to identify potential emergency situations associated with the San Joaquin Reservoir Dam, facilitate notification of affected parties, assign roles and responsibilities to involved agencies, and take mitigating actions in time to minimize loss of human life or injury and property damage. These situations include, but are not limited to dam instability, sizable earthquakes, extreme storm events, major spillway releases, overtopping of the dam, outlet system failure, abnormal instrument readings, vandalism or sabotage, spillway or gate failures, and failure of the dam.

Emergency management authorities will use the information in this EAP to facilitate the implementation of their responsibilities. Local, county, and state authorities have coordinating plans in place to address local emergency operations and/or warnings and evacuations. Those plans are not reprinted in the EAP but are maintained by the responsible agencies.

DSOD has rated the San Joaquin Reservoir Dam as “Extremely High” based on the downstream hazard classification. Because of its hazard classification, IRWD developed this EAP in accordance with the requirements listed in California Water Code Sections 6160 and 6161 and Government Code Section 8589.5, following the Federal Emergency Management Agency (FEMA) Federal Guidelines for Dam Safety: Emergency Action Planning for Dams (FEMA-64/July 2013).

1.3 Planning Team

During the initial EAP preparation in 2020, the EAP was sent to the following affected agencies below for comment during an extended local agency review period. The same agencies were contacted during the annual EAP update process to verify and update their respective information, most recently in March 2025.

- Irvine Ranch Water District
- Newport Beach Police Department
- Newport Beach Fire Department
- Irvine Police Department
- Orange County Fire Authority (OCFA)²

¹ From FEMA Federal Guidelines for Dam Safety, Emergency Action Planning for Dams, July 2013. (FEMA 64)

² OCFA provides fire service to the City of Irvine

- Orange County Sheriff’s Department (OCSD), Emergency Management Division (EMD)
- Orange County Public Works
- California Highway Patrol (CHP), Santa Ana Office
- California Department of Transportation (Caltrans) District 12 Office

Outreach was completed for all jurisdictions potentially affected by a dam failure at San Joaquin Reservoir Dam. The City of Newport Beach Police Department is the primary Public Safety Answering Point (PSAP) for this EAP. Though the dam may affect multiple jurisdictions, the potential impacts are primarily within the City of Newport Beach.

Emergency planning for the City of Newport Beach is coordinated through the Newport Beach Police Department.³ The Police Department’s Emergency Services Coordinator reviewed and approved the notification flowcharts presented in Section 3. The Newport Beach Fire Department reviewed the EAP but did not have comments.

Emergency planning for the City of Irvine is coordinated through the Irvine Police Department.¹ The Emergency Management Administrator from the Irvine Police Department reviewed the EAP and provided feedback on jurisdictional responsibilities. OCFA serves the City of Irvine as part of the OCFA Division 2 service area. The OCFA Division 2 chief reviewed the EAP and provided updated contact information for OCFA staff.

IRWD consulted with the OCSD EMD regarding contact numbers and jurisdictions.

Outreach was completed to DSOD to clarify responsibilities listed in this EAP. Additional coordination was conducted with the National Weather Service (NWS), CHP, Caltrans, and the Department of Water Resources (DWR) Flood Operations Center.

For more information about the outreach process, please contact the EAP Coordinator:

Steve Choi, Director of Safety and Security

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³ The City of Newport Beach and City of Irvine do not have offices of emergency services that are separate from their police departments.

Section 2: Summary of EAP Responsibilities

2.1 Irvine Ranch Water District (IRWD) Responsibilities (Dam Owner)

IRWD, as the dam owner, is responsible for detecting and evaluating dam safety incidents, classifying the incident, notifying emergency management authorities, taking appropriate response actions, terminating the EAP, and follow-up tasks related to the dam incident.

General EAP responsibilities for IRWD are to:

- Detect, verify and assess emergency conditions.
- Respond to emergencies at the dam site.
- Activate and implement the San Joaquin Reservoir Dam EAP, including determining the appropriate emergency level.
- Notify other participating emergency management agencies of emergency conditions, emergency level, EAP activation, and other critical information.
- Utilize IRWD Emergency Operations Plan (EOP) for internal emergency response coordination.
- Take corrective action at the dam/reservoir.
- Terminate the EAP.
- Facilitate an after-action evaluation and report.
- Update EAP on at least an annual basis.
- Communicate with the public and the media.

More detailed responsibilities, including duties by staff member, are given in Section 6.1 and *Table 6-1 Dam Owner Responsibilities by Role*

2.2 Impacted Jurisdictions'/Public Safety Agencies' Responsibilities

A dam safety incident at San Joaquin Reservoir Dam has the potential to impact the City of Newport Beach and the City of Irvine. The involvement of potential impacted jurisdictions is crucial to the successful implementation of the EAP. Copies of the EAP were sent to impacted jurisdictions and public safety agencies as part of a local agency coordination effort to gather feedback and input to the emergency response process laid out in this EAP (see discussion in Section 1.3). Where applicable, comments from these agencies informed the responsibilities detailed below.

Field Level Incident Management

A dam safety incident is reported through a 911 or direct phone call to the Newport Beach Police Department (see Section 3). The emergency response through the public safety agencies can be assisted by the OCSD "Control One," which is the central point of contact for interoperable

communications between all law enforcement, fire, and public works agencies responding to emergencies in Orange County.

Once the incident is reported, an ICP may be established by the Newport Beach Police Department. The Incident Commander (IC) is a field level position that falls to the Newport Beach Police Department. For Potential Failure or Imminent Failure dam safety incidents, the Newport Beach Police Department and Newport Beach Fire Department may establish a Unified Command to jointly perform the IC duties for a dam safety incident at the San Joaquin Reservoir Dam. If necessary, the Unified Command could also be extended to include the City of Irvine and OCFA to share incident management responsibilities in both Newport Beach and Irvine. The Unified Command will include representatives from IRWD.

Unified Command/IC responsibilities consist of establishing the ICP, protecting life and property, controlling personnel and equipment resources, maintaining accountability for responder and public safety, and establishing and maintaining an effective liaison with outside agencies and organizations. The Unified Command/IC is responsible for all incident activities, including the development of strategies and tactics and the ordering and the release of resources.

The Unified Command/IC has overall authority and responsibility for conducting incident operations, while IRWD is responsible for monitoring and remedial actions at the dam site (see Section 5). IRWD remedial actions will be controlled at the IRWD operations center. IRWD actions will be coordinated with external emergency response agencies through the ICP, the City of Newport Beach Emergency Operations Center (EOC), and the County and Operational Area (OA) EOC, if activated.

Unified Command/IC duties may include the following:

- Establishing command.
- Ensuring responder safety.
- Assessing incident priorities.
- Determining operational objectives.
- Developing an appropriate organizational structure.
- Maintaining a manageable span of control.
- Coordinating overall emergency activities.
- Coordinating the activities of outside agencies.
- Authorizing the release of information to the media.
- Terminating the emergency response⁴.
- Participating in an annual review and update of the EAP.

2.2.2 City of Newport Beach

The City of Newport Beach Emergency Operations Plan⁵ addresses the City of Newport Beach's planned response to emergencies associated with natural and man-made disasters. It provides an

⁴ The Unified Command/IC has the authority to terminate the emergency response. IRWD, as the dam owner, will terminate the EAP.

⁵ Available at: <https://www.newportbeachca.gov/home/showpublisheddocument/72743/638059324946730000>

overview of operational concepts, identifies components of the City's emergency management organization within the SEMS, and describes the overall responsibilities of the federal, state and county entities and the City for protecting life and property, and assuring the overall well-being of the population.

In the event of a dam emergency at the San Joaquin Reservoir Dam, the City of Newport Beach will be the lead agency for executing and coordinating emergency response activities. Depending on the severity of the emergency, a Local Emergency may be proclaimed, the City of Newport Beach EOC may be activated, and Orange County OA will be advised. The primary location for the City of Newport Beach EOC is the Police Department Auditorium (870 Santa Barbara Drive, Newport Beach). There are also four alternate locations for an EOC within the city.

The City's Emergency Operations Plan calls for a Unified Command for a dam failure incident. As discussed in Section 2.2.1, a Unified Command is anticipated for potential or imminent failure situations. Depending on the situation, the Unified Command could include representatives from the Irvine Police Department and OCFA.

The City of Newport Beach maintains responsibility for the evacuation of the inundation areas within the City limits, based on the threat and situation. Evacuation responsibilities would be directed by the Unified Command and carried out by the Newport Beach Police Department and Fire Department.

Newport Beach Police and Fire Department responsibilities include:

- Advising threatened populations of the emergency, and apprising them of safety measures to be implemented.
- Advising the Orange County OA of the emergency.
- Identifying the need for mutual aid and requesting such through the Orange County OA.
- Proclamation of a Local Emergency by local authorities.
- Dissemination of accurate and timely emergency public information and warning to the public.
- Evacuation and rescue operations.
- Establishing evacuation routes and road closures.
- Facilitating return of evacuated individuals.
- Medical care operations.
- Care and shelter operations, including establishing shelters.
- Access and perimeter control.
- Public health operations.
- Restoration of vital services and utilities.
- Participating in an after-action evaluation.

2.2.3 City of Irvine

The City of Irvine Emergency Operations Plan⁶ addresses the City of Irvine's planned response to emergencies associated with natural and man-made disasters. It provides an overview of

⁶ Available at: <https://legacy.cityofirvine.org/civica/filebank/blobdload.asp?BlobID=34359>

operational concepts, identifies components of the City’s emergency management organization within the Standardized Emergency Management System (SEMS), and describes the overall responsibilities of the federal, state and county entities and the City for protecting life and property, and assuring the overall well-being of the population. The City of Irvine has its own police department. Fire protection services in Irvine are provided by OCFA. Emergency planning for the City of Irvine is coordinated through the Irvine Police Department.

The inundation area for a sudden and total failure of San Joaquin Reservoir Dam is expected to be confined to San Diego Creek within Irvine city limits. Because of this, evacuation of residents will not likely be necessary. However, high flows in the creek could pose a danger to public safety. City of Irvine responsibilities will be executed by the Irvine Police Department with assistance from OCFA, as needed.

Responsibilities for the Irvine Police Department and OCFA in the City of Irvine include:

- Advising threatened populations of the emergency, and apprising them of safety measures to be implemented.
- Dissemination of accurate and timely emergency public information and warning to the public.
- Evacuation and rescue operations.
- Establishing evacuation routes and road closures.
- Facilitating return of evacuated individuals.
- Medical care operations.
- Care and shelter operations, including establishing shelters.
- Access and perimeter control.
- Public health operations.
- Restoration of vital services and utilities.
- Participating in an after-action evaluation.

2.2.4 Orange County Sheriff’s Department, Emergency Management Division

Thirty-four incorporated cities in the county are responsible for emergency planning within their jurisdictions. The County of Orange (County) is responsible for the emergency planning of 205 square miles of unincorporated area and all county-owned facilities and properties.

The County provides support to OA jurisdictions or local governments by identifying and coordinating resources and communicating with regional and state authorities. During disasters, OA jurisdictions are required to coordinate emergency operations with the OA and, in some instances, other local governments.

Based on the inundation mapping conducted in support of this EAP, activation of the County and OA EOC is not anticipated for a failure at San Joaquin Reservoir Dam. The City of Newport Beach is almost exclusively affected by a dam emergency at the San Joaquin Reservoir Dam. However, since no emergency response situation is completely predictable, there may be situations where the County and OA EOC may be activated and staffed based on the situation.

The County of Orange and Operational Area Emergency Operations Plan (County and OA EOP) provides guidance and procedures for the County to prepare for and respond to significant or

catastrophic natural, technological or conflict-related incidents that produce situations requiring a coordinated response. It further provides guidance regarding management concepts, identifies organizational structures and relationships and describes responsibilities and functions of the emergency organization to protect life and property. OCS D EMD is responsible for developing, maintaining and distributing the County and OA EOP.

There are two roles within the OA discussed in this EAP: County and OA EOC Manager and the Operational Area Coordinator (OAC).

County and OA EOC Manager. The OCS D EMD Director serves as the County and OA EOC Manager. The County and OA EOC Manager is the 24-hour point of contact for the County, Operational Area, State, Federal entities and agencies, and Mutual Aid Coordinators.

Responsibilities of the County and OA EOC Manager may include:

- Establish and maintain contact with the affected dam and reservoir owner or operators.
- Request current situational status of the affected dam and reservoir.
- Ensure the OAC, Board of Supervisors and Policy Group are notified and kept apprised of emergency conditions occurring due to a dam and reservoir failure event.
- Coordinate with the OAC to establish activation level of the County and OA EOC.
- Direct EMD staff to notify appropriate key personnel to report to the County and OA EOC, based on the activation level established.
- Establish and maintain communication with all impacted jurisdictions to ensure coordination of response activities and situational information.
- Ensure situational information is provided to OA jurisdictions, County departments and Cal OES, and updated on a regular basis.
- Assist with the coordination of the County's reentry and recovery efforts.

Operational Area Coordinator. When an emergency impacts an OA jurisdiction, the Orange County Operational Area Agreement designates the OAC as being responsible for direction, coordination and communication of policy decisions, and coordinating resource needs and priorities between OA jurisdictions and the State throughout the emergency. In cases of dam and reservoir failure, the County and OA Emergency Operational Plan, Dam and Reservoir Failure Annex designates Orange County Public Works (OCPW) as the OAC.

Responsibilities of the OAC may include:

- Serve as a key decision maker in the County and OA EOC, providing direction and coordination necessary to accomplish the purposes of the Operational Area Agreement and responsibilities of the Operational Area Lead as specified in Title 19 California Code of Regulations Section 2409 (e).
- Coordinate with OA jurisdictions during emergency response.
- Maintain contact with the dam and reservoir owner/operator to receive regular updates on water releases and situation status.
- Represent the Operational Area in all dealings with the public or private agencies on matters pertaining to emergencies.

- Appoint a Public Information Manager (PIM) to coordinate dissemination of all emergency information.
- In coordination with the PIM, prepare and approve dam and reservoir failure information statement and instructions for the public to be released via: media, Emergency Alert Systems, NWS, and AlertOC.
- Activate the County and OA EOC to the appropriate level of organization and staffing to support operations.
- Participate in conference calls.
- Initiate discussion with the Policy Group on the necessity to proclaim a Local Emergency and/or Operational Area Proclamation of Emergency.

A dam and reservoir failure may require multi-jurisdiction, multi-agency and multi-discipline coordination at all levels, including first responders. The Dam and Reservoir Failure Annex delineates the specific organization and assignment of responsibilities within the County and OA EOC. The appropriate Standardized Emergency Management System (SEMS) and NIMS functions will be activated, based on the failure threat or situation.

Activation of the County and OA EOC is required by SEMS, Title 19 California Code of Regulations Section 2409 (f), under the following conditions:

- On Request - A local government within the OA has activated its EOC and requested activation of the County and OA EOC to support its emergency operations. Jurisdiction(s) determine that additional response resources beyond that which would normally be covered by mutual aid are required and assistance from the OA may be necessary.
- Two City Local Emergency - Two or more cities within the OA have proclaimed a Local Emergency.
- County and City Local Emergency - The County and one or more cities have proclaimed a Local Emergency.
- Request for Governor's Proclamation - A city, city and County, or County has requested a Governor's proclamation of a State of Emergency, as defined in Government Code 8558(b).
- State of Emergency - A State of Emergency is proclaimed by the Governor of the State for the County or two or more cities within the OA.
- Request for Outside Resources - The OA is requesting resources from outside its boundaries, except those resources used in normal day-to-day operations which are obtained through existing agreements providing for the exchange or furnishing of certain types of facilities and services on a reimbursable, exchange, or other basis as provided for under the Master Mutual Aid Agreement.
- Request for OA Resources - The OA has received resource requests from outside its boundaries, except those resources used in normal day-to-day operations which are obtained through existing agreements providing for the exchange or furnishing of certain types of facilities and services on a reimbursable, exchange, or other basis as provided for under the Master Mutual Aid Agreement.

2.2.5 California Governor’s Office of Emergency Services (Cal OES) and Cal OES Warning Center

Cal OES plays dual roles in managing an emergency; one at the regional level and the other at the state level. The regions include Inland Region, Coastal Region, and Southern Region, while the state level constitutes the executives and brokers resources between the regions. The state level also interfaces with the National Response Framework, and informs the governor, legislature, and state emergency management stakeholders. Cal OES also implements state-level media policy and provides the primary coordination with SEMS and NIMS at the federal level. Cal OES Southern Region will participate in the reviews of and updates to the EAP.

The Dam Safety Planning Division is responsible for reviewing and approving dam owners’ EAP. This process includes division outreach and technical assistance to dam owners and local emergency management personnel. The Cal OES Dam Safety Planning Division may also provide guidance to local public safety agencies with regard to incorporating EAPs into their existing all-hazards key response and mitigation plans. The division will also participate in the annual review and update of the EAP.

The Cal OES Warning Center is the link for notifications between state and federal agencies for this EAP. The mission of the Cal OES Warning Center is to be a central intelligence hub for statewide emergency communications and notifications, serving as a highly reliable and accurate “onestop” resource for emergency management, law enforcement, fire, and key decision-making personnel throughout the state. The Cal OES Warning Center is staffed 24 hours a day, seven days a week watching over California to identify potential and emerging threats, provide alert notification to all levels of government as well as critical situational awareness during an emergency or disaster.

The Cal OES Warning Center has the responsibility to receive, coordinate, verify and disseminate information pertaining to events which occur within California or that could affect California. Information received by the Cal OES Warning Center is coordinated between Cal OES and other sources to ensure that the information which is disseminated is both timely and accurate.

2.2.6 California Department of Water Resources (DWR) – Division of Safety of Dams (DSOD)

The mission of DSOD is to protect people against the loss of life and property due to dam failure. The California Water Code entrusts this regulatory power to DWR, which delegates the responsibility to DSOD. Section 6110 of the Water Code directs the Department to immediately employ any remedial means necessary to protect life and property if either: (a) the condition of the dam is so dangerous to the safety of life or property as to not permit time for the issuance and enforcement of an order relative to maintenance or operation, or (b) passing or imminent floods threaten the safety of any dam or reservoir. Section 6111 of the Water Code states that in applying the remedial means “the department may, in emergency, do any of the following: (a) lower the reservoir; (b) completely empty the reservoir; (c) take such other steps as may be essential to safeguard life and property.” In the event of an emergency at the dam, DSOD actions could include, but are not limited to:

- Advising the dam owner's/operator's representative of remedial actions to take.
- Ordering the dam owner's/operator's representative of remedial actions to take.
- Assuming control of the dam if necessary to safeguard life and property.
- Advising the dam owner's/operator's representative of the emergency level determination
- Inspecting the dam during and after the emergency.
- Design review and approval of emergency repairs.
- Acting as a dam technical specialist in the State Operations Center, or other emergency operations center.

Additionally, per Water Code Sections 6160 and 6161, DSOD is responsible for the review and approval of inundation maps. The California Code of Regulations, Title 23, Division 2, Chapter 1, Article 6 defines the specific requirements of the inundation maps.

IRWD communicated with DSOD staff to confirm DSOD responsibilities as described in this EAP. These DSOD responsibilities were provided to IRWD by Richard Draeger, the regional engineer, via email on December 12, 2019.

2.2.7 National Weather Service Weather Forecast Office

The NWS has a congressional mandate to issue official public warnings for all weather-related events, including dam breaches and flooding. The NWS communicates all flash flood watches and warnings based on the inundation maps provided in this EAP. The San Diego Weather Forecast Office has a copy of the enclosed inundation map and will issue official public warnings upon notification, as appropriate, and in coordination with City of Newport Beach and the OCSD EMD.

The NWS WFO will issue a 'Flash Flood Watch' for a potential dam failure and a 'Flash Flood Warning' following the confirmation of a dam failure for downstream areas.

2.2.8 DWR Flood Operations Center

The mission of the DWR Division of Flood Management is to prevent loss of life and reduce property damage caused by floods and to assist in recovery efforts following any natural disaster. The State-Federal Flood Operations Center, located in Sacramento, California, is operated by the Division of Flood Management. The Flood Operations Center provides a facility from which DWR can centrally coordinate emergency response state-wide. Upon activation of this EAP, the DWR Flood Operations Center will be notified by the dam owner. During a potential or imminent failure scenario, the DWR Flood Operations Center would be responsible for assisting with coordination among state and local agencies. The DWR Flood Operations Center can also provide technical assistance during an incident.

2.2.9 Orange County Public Works

A copy of the EAP was sent to Orange County Public Works (OCPW), as channel facilities and infrastructure managed by OCPW may be affected by an incident at San Joaquin Reservoir Dam.

OCPW is a plan holder of this EAP and may assist with response related to county-managed facilities.

2.2.10 California Highway Patrol, Santa Ana Office

A copy of the EAP was sent to California Highway Patrol (CHP). State Route 73 would potentially be impacted by an incident at San Joaquin Reservoir Dam. CHP dispatch is included in the notification charts in this EAP. In the event of an emergency at San Joaquin Reservoir Dam, CHP would be responsible for evacuating impacted state highways and controlling traffic on these roads. CHP response would be coordinated by the Unified Command/IC.

2.2.11 Caltrans

A copy of the EAP was sent to Caltrans staff at the District 12 (Orange County) office so that they could review the EAP with regard to state highway facilities. Emergency response at state highways would be coordinated by CHP through the Unified Command, but Caltrans staff may assist with response related to state-managed road facilities. Caltrans is included in the notification charts in this EAP.

2.2.12 Transportation Corridor Agencies (Orange County Toll Roads)

A copy of the EAP was sent to Transportation Corridor Agencies (TCA), who administers the Toll Roads of Orange County. State Route 73 is a toll road administered by the Transportation Corridor Agencies and could be affected by inundation from San Joaquin Reservoir Dam. The EAP was provided for their planning purposes. Caltrans owns the Toll Roads and maintains them as part of the state highway system and the California Highway Patrol is responsible for law enforcement on the Toll Roads.

2.2.13 Water Emergency Response Organization of Orange County

A copy of the EAP was sent to the Water Emergency Response Organization of Orange County (WEROC), which supports and manages countywide emergency preparedness, planning, response, and recovery efforts among Orange County water and wastewater utilities. WEROC does not have any prescribed responsibilities in this EAP, but may assist with a mutual aid emergency response to a dam safety incident at the San Joaquin Reservoir Dam.

Section 3: Notification Flowcharts

3.1 Notification Flowcharts

This section contains notification flowcharts and accompanying messages for each emergency level that could be activated at the San Joaquin Reservoir Dam: high flow, non-failure, potential failure, and imminent failure. The high flow and non-failure scenarios share a notification flow chart, as the same parties would be notified during each event, but have different notification messages. Similarly, the potential failure and imminent failure share a notification flow chart, but have different notification messages. The notification messages for all emergency levels can also be found in Appendix E of this EAP. See Section 5.1 for an explanation of emergency level determination.

IRWD and public safety agencies should reference these flowcharts to know who to contact and in what order in the event of a dam emergency. Individuals or organizations at the beginning of flowchart branches are responsible for making all calls within that branch, in the order indicated. If a party is not answering the number indicated on the flowchart, the notifying party should reference the contact table given in Section 3.2 for alternate methods of contact. In order to facilitate clear and efficient communication of emergency conditions, suggested scripts for notification are included after each flowchart. To ensure timely and efficient notifications during a rapidly developing emergency situation, the suggested scripts for verbal notifications via phone calls are short and direct, and will be followed by text and/or email confirmations containing the language in the pre-scripted messages suggested in Appendix E.

The San Joaquin Reservoir Dam does not impound water from the upstream drainage area (runoff from the area is routed around the reservoir in stormwater conveyances). It is therefore highly unlikely that it would be affected by a high flow situation as described in the FEMA guidelines. However, a notification flowchart and emergency message have been included for the high flow scenario to ensure complete preparedness.

The notification flowcharts require that the PSAP, City of Newport Beach Police Department, make additional calls as part of the notification process. IRWD has coordinated with the Newport Beach Police Department to ensure that they have a copy of the EAP on hand and will utilize the notification flowcharts in Section 3.1. To ensure that notifications are made in a timely manner, multiple staff members will be available to make notification calls for the Newport Beach Police Department. The Newport Beach Police Department may also use a mass notification system to communicate with all downstream public agencies at once. The Newport Beach Police Department has agreed to perform the responsibilities in the notification flowcharts and in this EAP. These instructions will be updated annually when the plan is reviewed and contacts are updated (see Section 8.1).

The notification charts in this section rely upon cellular phones and landlines as the means of communication. Alternative communication methods may be necessary during a severe emergency in which the region experiences power and cellular network outages. The PSAP, Newport Beach Police Department, utilizes the 800-megahertz (MHz) radio system and can

communicate dispatch-to-dispatch to other local emergency management agencies (e.g., Irvine Police Department, OCFA, Caltrans, etc.). Orange County Control One also has the ability to communicate on a designated radio channel.

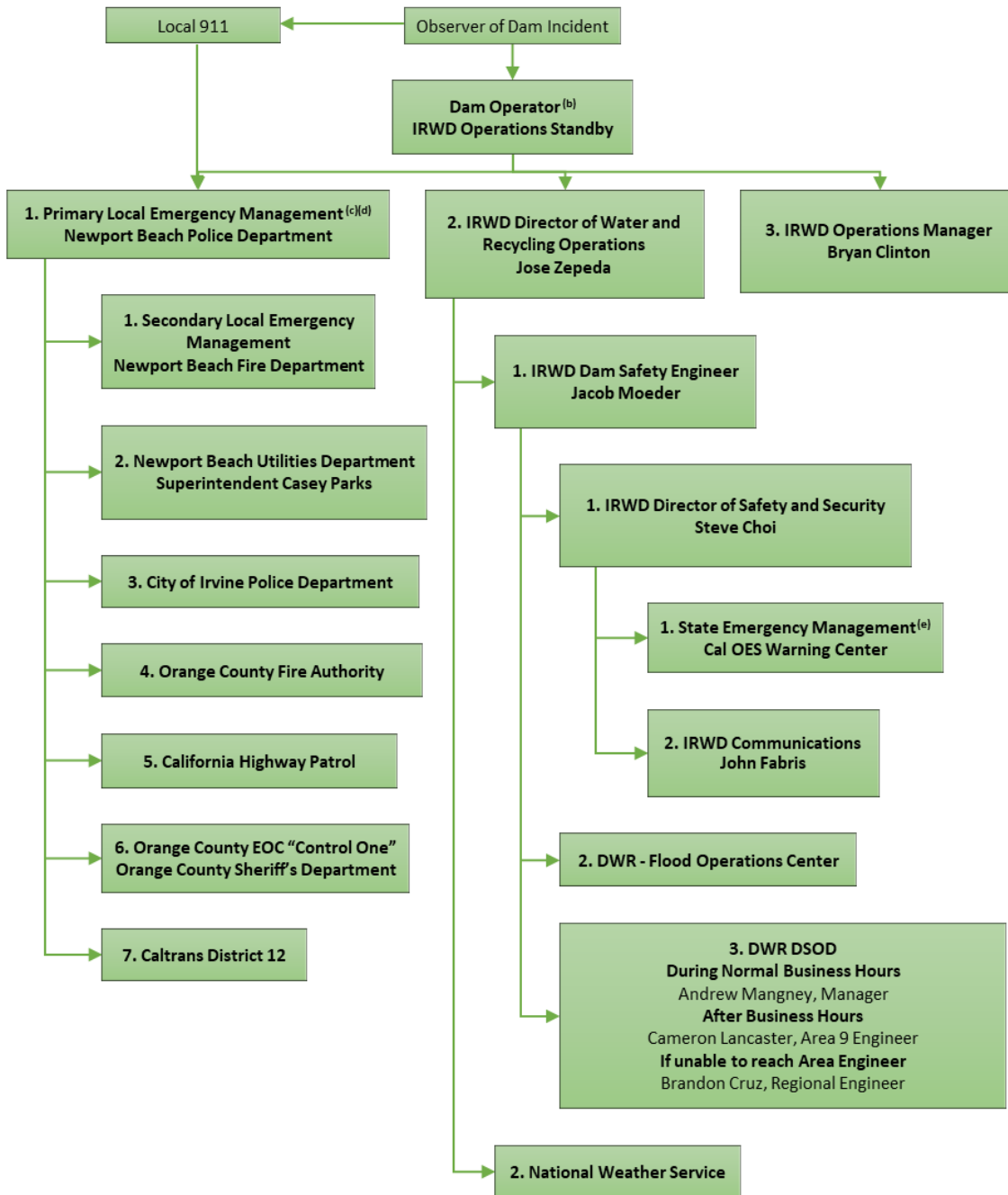
IRWD and other agencies have access to Government Emergency Telecommunications Service (GETS), which is operated by the federal government to prioritize emergency calls made over landlines and cellular lines. Users with GETS logins have priority access to telephone networks when there is congestion or other service problems. IRWD also has satellite phones that can be used for communications during a dam emergency, as well as two-way radio communications capability with WEROC.

The NWS has satellite phones which are operated to make outgoing calls if landlines or cellular service are unavailable. The NWS and Caltrans also use amateur radio transmissions as a backup method for communication.

High Flow or Non-Failure Notification Flowchart^(a)

Notifications to be made in order of appearance on flowchart. First number listed is primary contact number, second number listed (if applicable) is secondary contact number.

MAKE IT CLEAR THE DAM IS CURRENTLY SAFE. See suggested notification scripts in Section 3 of the EAP.



Notes:

- a. Use this chart in and the Contact Log in Appendix D to document notifications.
- b. After dam incident is reported to IRWD, IRWD will activate the EAP if necessary and make emergency level determination, triggering the continuation of notifications. Refer to Section 5 of the EAP for the EAP Response Process.
- c. Contact the Dam Operator if 911 is notified by a non-utility observer.
- d. Newport Beach Police Department notification calls will be made by multiple staff members and/or mass notification systems.
- e. Use the Cal OES Warning Center Dam Incident Report in Appendix I. Send a copy to Newport Beach Police Department.

Phone numbers and email addresses have been removed from this publicly posted copy of this Emergency Action Plan. That information is available from Irvine Ranch Water District's district secretary: Phone 949-453-5300, Email Comments@IRWD.com

High Flow Emergency Level Notification Script

This is _____ [your name and position].

IRWD has activated the Emergency Action Plan for San Joaquin Reservoir Dam, No. 1029.000, located in Newport Beach. The dam is under a **High Flow** condition but is not in danger of failing.

High flows at the dam began at _____ on _____.
(time) (date)

The current flow at the dam is ____ cfs.

You have/will receive a text or email with additional details. We'll provide updates when there are any changes in flow or dam condition. What is the best way to contact you with additional updates? [record contact information].

I can be contacted at _____. [preferred contact method]

If you can't reach me, please use _____. [alternate contact method]

Non-Failure Emergency Level Notification Script

This is _____ [your name and position].

IRWD has activated the Emergency Action Plan for San Joaquin Reservoir Dam, No. 1029.000, located in Newport Beach. The dam is under a **Non-Failure** condition and is not in danger of failing.

IRWD activated the EAP because _____.
(description of condition)

You have/will receive a written notification with additional details. We'll provide updates detailing any changes in flow or dam condition. What is the best way to contact you with additional updates? [record contact information].

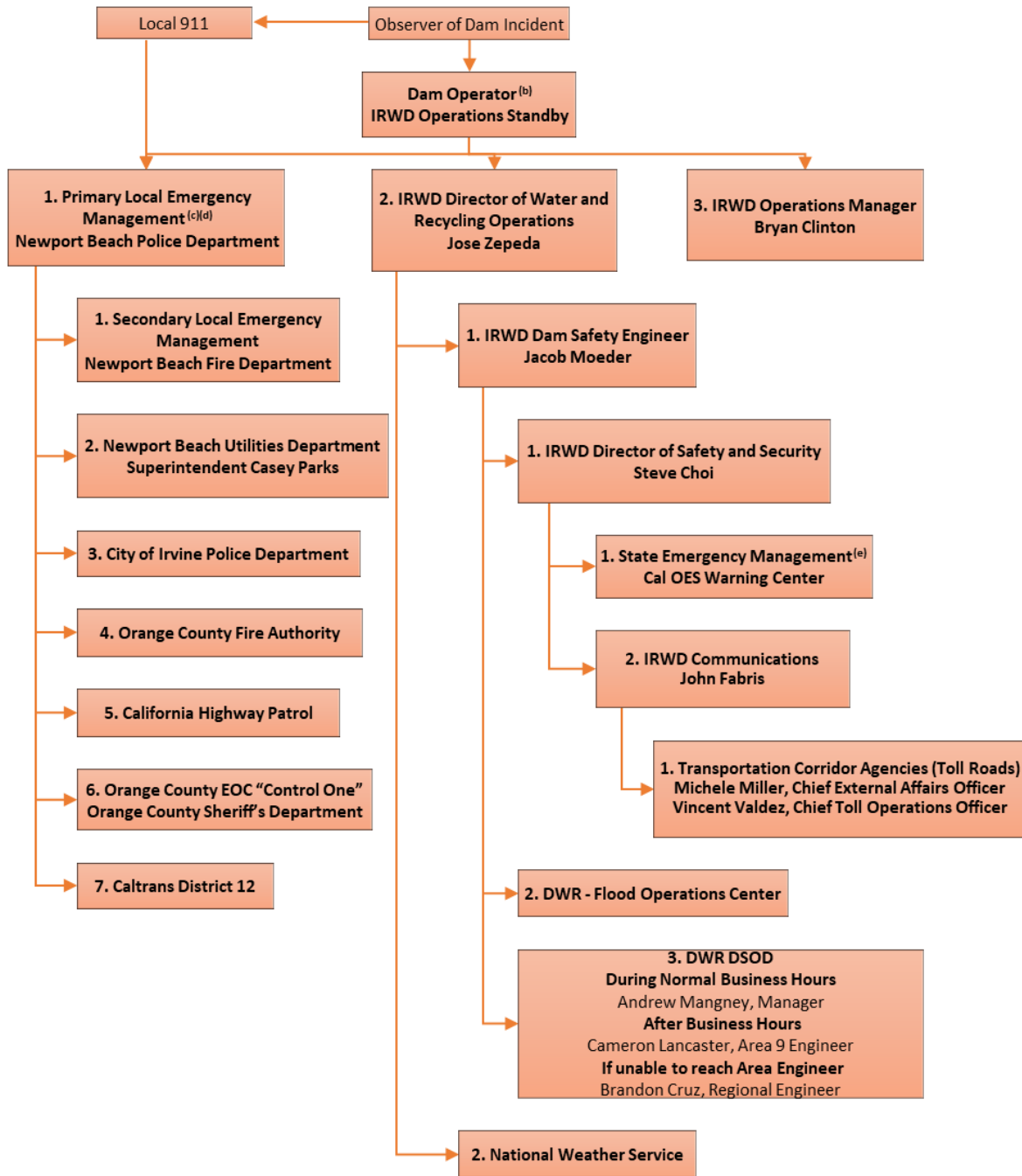
I can be contacted at _____. [preferred contact method]

If you can't reach me, please use _____. [alternate contact method]

Potential or Imminent Failure Notification Flowchart^(a)

Notifications to be made in order of appearance on flowchart. First number listed is primary contact number, second number listed (if applicable) is secondary contact number.

See suggested notification scripts in Section 3 of the EAP.



Notes:

- a. Use this chart in and the Contact Log in Appendix D to document notifications.
- b. After dam incident is reported to IRWD, IRWD will activate the EAP if necessary and make emergency level determination, triggering the continuation of notifications. Refer to Section 5 of the EAP for the EAP Response Process.
- c. Contact the Dam Operator if 911 is notified by a non-utility observer.
- d. Newport Beach Police Department notification calls will be made by multiple staff members and/or mass notification systems.
- e. Use the Cal OES Warning Center Dam Incident Report in Appendix I. Send a copy to Newport Beach Police Department.

Phone numbers and email addresses have been removed from this publicly posted copy of this Emergency Action Plan. That information is available from Irvine Ranch Water District's district secretary: Phone 949-453-5300, Email Comments@IRWD.com

Potential Failure Emergency Level Notification Script

This is _____ [your name and position].

IRWD has activated the Emergency Action Plan for San Joaquin Reservoir Dam, No. 1029.000, located in Newport Beach. The dam is under a **Potential Failure** condition and may be in danger of failing.

IRWD is responding to _____ [describe event] that could result in dam failure as early as _____.

Please reference the inundation map in your copy of the Emergency Action Plan and prepare to evacuate the low-lying portions of Newport Beach and Irvine west of Macarthur Boulevard.

The Newport Beach Police Department is the PSAP for this emergency.

You have/will receive a written notification with additional details. We'll provide updates detailing any changes in flow or dam condition. What is the best way to contact you with additional updates? [record contact information].

I can be contacted at _____. [preferred contact method]

If you can't reach me, please use _____. [alternate contact method]

Imminent Failure Emergency Level Notification Script

This is an emergency. This is _____ [your name and position].

San Joaquin Reservoir Dam, No. 1029.000, located in Newport Beach, is failing.

The downstream area must be evacuated immediately.

Repeat, San Joaquin Reservoir Dam is failing; evacuate the low-lying portions of the Newport North, Newport Canyon, and Baypoint Residences, as well as Bonita Creek Park and the Bonita Creek Bike Path. Bonita Canyon Drive, Jamboree Road, University Drive, and State Route 73 near Bison Avenue are expected to be inundated and should be closed. Do not approach channels where high flow is expected.

Reference the inundation map in your copy of the Emergency Action Plan for specific evacuation areas.

The Newport Beach Police Department is the PSAP for this emergency.

You have/will receive a written notification with additional details for this **Imminent Failure** condition.

I can be contacted at _____. [preferred contact method]

If you can't reach me, please use _____. [alternate contact method]

The next status report will be provided in approximately 30 minutes. What is the best way to contact you with additional updates? [record contact information].

Imminent Failure Emergency Level Public Message

The following pre-scripted message may be **used for emergency management authorities to communicate the Imminent Failure of the dam with the public:**

Attention: This is an emergency message from _____ [emergency management agency]. Listen carefully. Your life may depend on immediate action.

San Joaquin Reservoir Dam, located in Newport Beach, is failing. Repeat. San Joaquin Reservoir, Dam No. 1029.000, located in Newport Beach, is failing.

If you are in or near this area, proceed immediately to high ground. The low-lying portions of the Newport North, Newport Canyon, and Baypoint Residences, as well as Bonita Creek Park and the Bonita Creek Bike Path may be inundated. Bonita Canyon Drive, Jamboree Road, University Drive, and State Route 73 near Bison Avenue are expected to be inundated and access may be limited. High flows are expected in Bonita Creek, San Diego Creek, and Upper Newport Bay. Do not approach channels where high flow is expected.

If you are in or near this area, proceed immediately to high ground away from low lying areas.

Repeat message.

3.2 Contact Information Table

The contact table below lists all parties included in the notification flowcharts, along with other key stakeholders. If unable to contact a party using the method shown on the flowcharts, refer to this table to attempt to contact through a different pathway. All contacts included in the flow charts and contact tables are confirmed to be up-to-date as part of the annual EAP review process.

Organization	Name (Title)	Primary Phone #	Secondary Phone #	Email Address	Written Emergency Notification Method
Cal OES	California State Warning Center				Email
Caltrans (District 12)	24-hour Notification Number				None
Caltrans (District 12)	Ben Nanjappa (D-12 Maintenance Engineering)				Text + email
Caltrans (District 12)	John Bybee (EOC Coordinator)				Text + email
CHP	24-Hour Dispatch in Santa Ana				None
CHP	Capt. Gustavo Torres				Email
CHP	Lt. Kris Ulibarri				Email
CHP	Lt. Stephanie Hamilton				Email
CHP	Sgt. Anselmo Templado				Email
CHP	State Dispatch number				None
CHP	Valerie Cardenas (Public Safety Dispatch Supervisor)				Email
DWR DSOD	Andrew Mangney (Field Engineering Branch Manager)				Email
DWR DSOD	Brandon Cruz (Southern Regional Engineer)				Text + email
DWR DSOD	Cameron Lancaster (Area 9 Engineer)				Text + email
DWR FOC	Flood Warning Center				None

Phone numbers and email addresses have been removed from this publicly posted copy of this Emergency Action Plan. That information is available from Irvine Ranch Water District's district secretary: Phone 949-453-5300, Email Comments@IRWD.com

Organization	Name (Title)	Primary Phone #	Secondary Phone #	Email Address	Written Emergency Notification Method
Irvine Police Department	24-Hour Dispatch				None
Irvine Police Department	Non-Emergency Dispatch				None
Irvine Police Department	Brendan Manning (Emergency Services Administrator)				Text + email
Irvine Police Department	Christine Tully (Emergency Services Supervisor)				Text + email
Irvine Police Department	Robert Simmons (Manager, Emergency Services)				Text + email
IRWD	Bryan Clinton (Operations Manager)				Text + email
IRWD	David Paulson (Operations Supervisor)				Text + email
IRWD	Jacob Moeder (Engineering Manager/Dam Safety Engineer)				Text + email
IRWD	John Fabris (Communications)				Text + email
IRWD	Jose Zepeda (Director of Water and Recycling Operations)				Text + email
IRWD	Operations Standby/Customer Service				None
IRWD	IRWD Communications Department				None
IRWD	Paul Cook, P.E. (General Manager)				Email

Phone numbers and email addresses have been removed from this publicly posted copy of this Emergency Action Plan. That information is available from Irvine Ranch Water District's district secretary: Phone 949-453-5300, Email Comments@IRWD.com

Organization	Name (Title)	Primary Phone #	Secondary Phone #	Email Address	Written Emergency Notification Method
IRWD	Steve Choi (Director of Safety and Security)				Text + email
Newport Beach Fire Department	24-Hour Dispatch (Metro Net)				None
Newport Beach Fire Department	Jeff Boyles (Fire Chief)				Text + email
Newport Beach Police Department	24-Hour Dispatch				None
Newport Beach Police Department	Katie Eing (Emergency Services Coordinator)				Text + email
Newport Beach Utilities Department	Casey Parks (Utilities Superintendent)				Text + email
Newport Beach Temple ^(a)	Main Office				None
Newport Coast Child Development ^(a)	Main Office				None
NWS	Sam Zuber				email
NWS	National Weather Service				None
OCFA	Non-Emergency Dispatch				None
OCFA	Nick Freeman (Division 2 Chief)				Email
OCPW	Trevor Richardson (Emergency Manager)				Email
OCSD	24-Hour Dispatch				None
OCSD	Emergency Operations Center "Control One"				None
OCSD	Kevin McArthur (Assistant Emergency Manager)				Text + email

Phone numbers and email addresses have been removed from this publicly posted copy of this Emergency Action Plan. That information is available from Irvine Ranch Water District's district secretary: Phone 949-453-5300, Email Comments@IRWD.com

Organization	Name (Title)	Primary Phone #	Secondary Phone #	Email Address	Written Emergency Notification Method
OCSD	Mayra Wheeler (Senior Emergency Management Program Coordinator)				Text + email
OCSD	Michelle Anderson (Emergency Management Director)				Text + email
St. Matthew's Church and School ^(a)	Main Office				None
TCA (Toll Roads)	Michele Miller (Chief External Affairs Officer)				Text + email
TCA (Toll Roads)	Vincent Valdez (Chief Toll Operations Officer)				Text + email
WEROC	Miriam Aldana (WEROC Specialist)				Email
WEROC	Vicki Osborn (Director of Emergency Management)				Text + email

Notes: (a) Newport Beach Temple, Newport Coast Child Development Preschool, and St. Matthew's Church and School are all located near the dam and have been added to the contact tables to facilitate communication about the EAP.

Phone numbers and email addresses have been removed from this publicly posted copy of this Emergency Action Plan. That information is available from Irvine Ranch Water District's district secretary: Phone 949-453-5300, Email Comments@IRWD.com

Section 4: Project Description

The San Joaquin Reservoir Dam was constructed in 1966. The dam impounds San Joaquin Reservoir, which stores recycled water for use within the IRWD service area. DSOD has designated the dam as Extremely High Hazard. The dam is a zoned rockfill embankment. It has a crest length of 873 feet. The barrier height is 218.5 feet, as measured from the maximum water surface at the spillway⁷ elevation of 472.9 feet⁸ to the estimated downstream toe at an elevation of 254.4 feet. The upstream face of the dam has a slope of 3:1, and the downstream face of the dam is sloped at a 2.25:1 ratio.

DSOD has not identified any CAS for San Joaquin Reservoir Dam. Figure 4-1 is a schematic of the reservoir, showing the dam, drop inlet structures, and outlet works. A location map and vicinity map were provided in Figures 1-1 and 1-2, respectively.

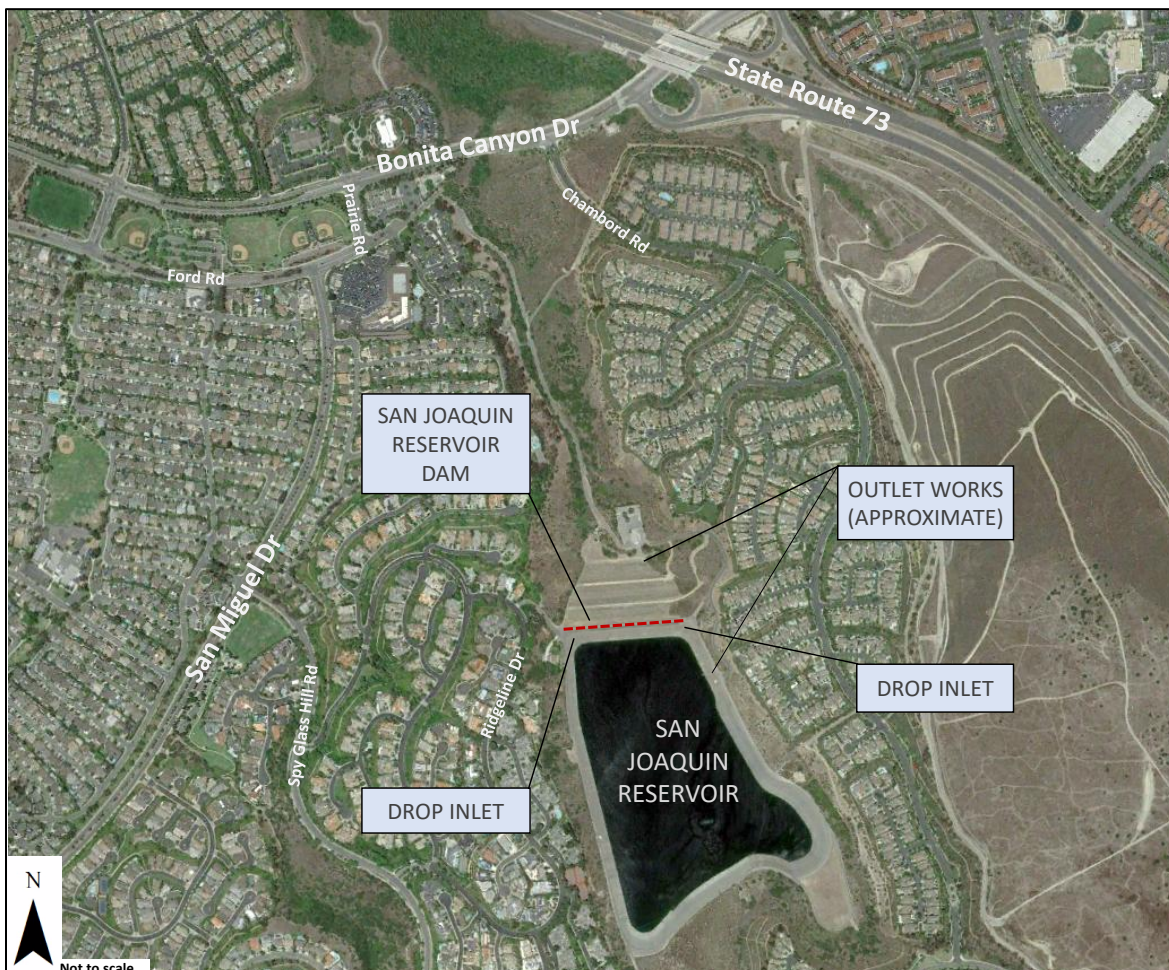


Figure 4-1 Schematic of San Joaquin Reservoir Dam

⁷ San Joaquin Reservoir Dam has two drop inlet structures which serve as spillway structures; the maximum capacity of the reservoir is referenced to the invert of these overflow drains.

⁸ Elevations in North American Vertical Datum of 1988 (NAVD88) unless specified otherwise.

The current capacity of the reservoir behind the dam, as provided by IRWD, is 2,950 acre-feet at the spillway elevation of 472.9 ft NAVD88. The modeling and inundation areas associated with failure at the San Joaquin Dam were completed using the full 2,950 acre-feet. Figure 4-2 gives the elevation-storage curve for the reservoir.

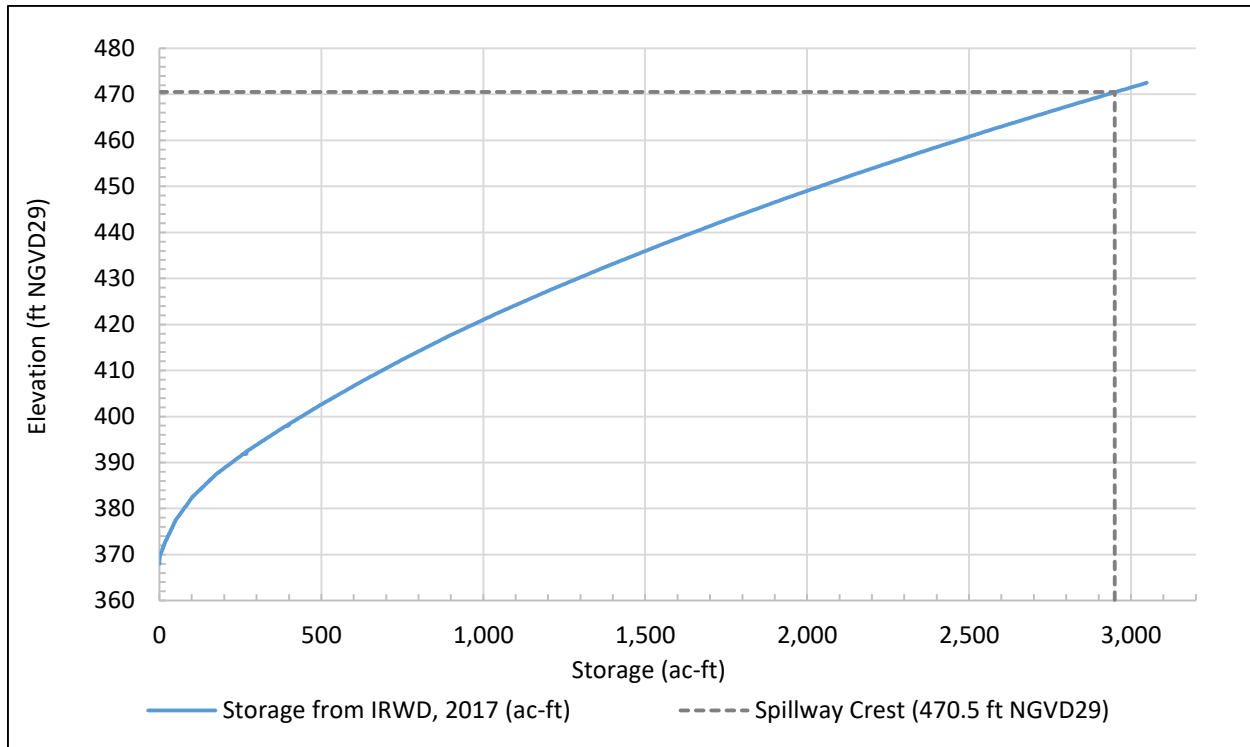


Figure 4-2 Reservoir Storage Capacity Curve in NGVD29

(add 2.38 ft to elevation to convert to NAVD88)

The drainage area upstream of the San Joaquin Reservoir is 0.4 square miles but the reservoir is isolated from upstream runoff, which is routed around the reservoir through stormwater conveyances. Therefore, impoundment of natural runoff is minimal. The reservoir stores recycled water from IRWD’s MWRP. The MWRP, located at 3512 Michelson Drive in the City of Irvine, is about three miles north of San Joaquin Reservoir Dam. Recycled water is conveyed from the MWRP directly to San Joaquin Reservoir. The reservoir is a source of supply for the recycled water system, including irrigation and dual-plumbed indoor use.

The dam has a 60-inch conduit running through it, which has five inlet/outlet valves, and serves as both inlet and outlet for the reservoir. There is a blowoff structure on the 60-inch conduit located at the downstream toe of the dam. The water level in San Joaquin Reservoir is controlled through the inlet/outlet valves, and if a potential of developing dam safety incident requires lowering of the reservoir level, this must be done in accordance with the standard IRWD procedures. All actions associated with controlling flow into or out of the reservoir must be coordinated with the IRWD’s water operations staff or a representative designated by IRWD.

Discharge curves for the outlet pipe have not been prepared; however, the typical discharge flowrate through the 60-inch conduit is 12 to 15 cfs. At these typical discharge rates, the estimated time to drain the full reservoir would be 100 to 125 days.

The San Joaquin Reservoir Dam has two drop inlet structures which act as spillway structures for the reservoir. Both structures discharge into conduit that conveys water to an energy dissipation box located in the channel downstream of the dam. The drop inlet structures are not designated as a Critical Appurtenant Structure (CAS) by DSOD. There are no spillway rating curves for the drop inlet structures.

No extremely high flow, emergency flow, or dam emergency incidents are known to have occurred at San Joaquin Reservoir Dam.

There are no dams upstream or downstream of San Joaquin Reservoir Dam which would contribute to or be affected by an emergency event at San Joaquin Reservoir Dam. Big Canyon Dam, a jurisdictional dam owned by the City of Newport Beach, is located about one mile southwest of San Joaquin Reservoir Dam. These dams are on separate stream tributaries and would not affect each other during a failure incident.

At a U.S. Geological Survey (USGS) streamflow gage on Bonita Creek downstream of the dam, the highest peak flow recorded⁹ is 3,700 cfs. Channel capacity¹⁰ is estimated to be on the order of 1,000 cfs. A dam failure flood wave at this location is expected to greatly exceed the capacity of the downstream channel.

If the dam were to fail, the low-lying portions of the Newport North, Newport Canyon, and Baypoint Residences, as well as Bonita Creek Park and the Bonita Creek Bike Path would be inundated. Bonita Canyon Drive, Jamboree Road, University Drive, and State Route 73 near Bison Avenue are also expected to be inundated and may be closed. Interstate 405 (I-405) would not be impacted by an incident at San Joaquin Reservoir Dam: at that location, the flood would be confined to San Diego Creek and would not overtop I-405.

⁹ From USGS gage 11048600; peak flow on October 27, 2004.

https://nwis.waterdata.usgs.gov/nwis/inventory/?site_no=11048600

¹⁰ Estimated from USGS Streamstats, on Bonita Creek at latitude 33.63099, longitude -117.84764; 100-year peak flood used as estimate of channel capacity; measured channel dimensions and capacity are not known.

<https://streamstats.usgs.gov/ss/>

Section 5: EAP Response Process

There are four steps that should be followed when an unusual or emergency incident is detected at the dam. These steps constitute the EAP Response Process. The steps are:

- Step 1: Incident detection, evaluation and emergency level determination
- Step 2: Notification and communication
- Step 3: Emergency actions
- Step 4: Termination and follow up

Early detection and evaluation of the condition(s) or triggering event(s) that initiate or require an emergency response action are crucial. Timely determination of an emergency level ensures that the appropriate response actions are taken based on the urgency of the situation. Procedures for early notification are provided in Section 3 that allow all entities involved with plan implementation to respond appropriately. Preventive or mitigating actions must be taken to attempt to address conditions at the dam. Eventually, a determination will need to be made concerning termination of the incident. After the incident is over, follow-up activities may be required. All of these steps make up the general EAP response process and are discussed in the following sections.

5.1 Step 1: Incident Detection, Evaluation, and Emergency Level Determination

Step 1 involves emergency detection, evaluation, and incident classification. Regular surveillance at the site is the normal method of detecting potential emergency situations. For conditions beyond the normal range of operations, contact DSOD for assistance with evaluation.

5.1.1 Monitoring, Detection, and Early Warning

This EAP establishes the procedures to be employed by IRWD personnel to ensure the safety of life and property at and downstream of the San Joaquin Reservoir Dam. There is a dam keeper who resides onsite, monitors the status of the reservoir, and maintains a presence at the dam. IRWD has a dam safety program which regularly monitors and inspects features of the dam to detect problems. This program includes:

- Monitoring of reservoir data in a SCADA system with alarms/alerts.
- Routine visual inspection of the dam.
- Measurement of seepage on a monthly basis. Seepage data are compared to historical data to assess trends and detect anomalies.
- Measurement of water levels on a monthly basis. Measurements are compared to historical data to assess trends and detect anomalies.
- Annual surveys of survey monuments. Survey measurements are compared to historical data to assess trends and detect anomalies.
- Annual inspections by IRWD staff.
- Annual inspections by DSOD.
- Periodic dam safety reviews that consider potential failure modes and risk analysis.

Though there is no public access to the dam, residential neighborhoods surround the reservoir, and it is possible for the general public to observe the dam and report potential anomalies from these residential areas.

Section 7 contains more details about how monitoring and detection instrumentation are used by IRWD for incident preparedness.

5.1.2 Emergency Level Determination

After identification of a dam threatening condition, the dam operator or a qualified engineer will determine if there is sufficient time for additional investigation before declaring an emergency situation. Prior to activating the EAP, the IRWD Director of Water and Recycling Operations, in conjunction with the Dam Safety Engineer and EAP Coordinator will determine the emergency level.

An emergency level determination may be re-evaluated at times during a dam emergency as it may not be readily apparent whether a complete breach will occur or how long it may take. IRWD, in conjunction with DSOD engineers, will be appropriately conservative in evaluating the emergency level determination and will provide emergency management authorities with the most complete information possible so that decisions regarding public safety and evacuations may be made quickly and effectively.

There are four dam safety emergency level categories for the San Joaquin Reservoir Dam. The sections below describe how each emergency level applies to the dam, and *Table 5-1 Emergency Level Determination* is provided for different incidents that pose dam safety hazards.

High Flow – High Flows in System, No Threat to Dam

The High Flow emergency level indicates that flooding is occurring on the river system, but there is no apparent threat to the integrity of the dam. The High Flow emergency level is used by the dam owner to convey to outside agencies that downstream areas may be affected by the dam's release. Although the amount of flooding may be beyond the control of the dam owner, information on the timing and amount of release from the dam may be helpful to authorities in making decisions regarding warnings and evacuations.

The San Joaquin Reservoir Dam has a very small drainage area and does not impound water from an upstream drainage area. It is therefore highly unlikely that it would be affected by a high flow situation as described in the FEMA guidelines. However, the high flow scenario has been included in this EAP to ensure complete preparedness. In some cases, flow over spillways could cause unexpected flooding downstream, but the dam is not endangered. In cases of reservoir releases, downstream residents may need to be notified if flooding threatens life or property, but it should be made clear that the dam is safe.

Non-Failure – Unusual, Slowly Developing Event

The Non-Failure emergency level is appropriate for an event at a dam that will not, by itself, lead to a failure, but requires investigation and notification of internal and/or external personnel. This classification indicates a situation is developing; however, the dam is not in danger of failing. In many cases, these unusual events are remedied with no further action required. Examples of Non-Failure events are (1) new seepage or leakage on the downstream side of the dam, (2) presence of unauthorized personnel at the dam, and (3) malfunction of an inlet valve in the open position creating the potential for high flow downstream of the dam or excessive erosion in the vicinity of the outlet works.

Potential Failure – Potential Dam Failure, Rapidly Developing

This classification indicates that a situation is rapidly developing that could cause the dam to fail. A reasonable amount of time is available for analysis before deciding whether to evacuate residents. Emergency responders in affected areas will be alerted that an unsafe situation is developing. The Potential Failure emergency level indicates that conditions are developing at the dam that could lead to a dam failure. Examples of Potential Failure events are (1) rising reservoir levels that are approaching the top of the non-overflow section of the dam, (2) transverse cracking of an embankment, and (3) a verified bomb threat. Declaration of a Potential Failure should convey that time is available for analyses, decisions, and actions before the dam could fail. A failure may occur, but predetermined response actions may moderate or alleviate failure.

Imminent Failure – Dam Failure Appears Imminent or In-Progress

The Imminent Failure emergency level indicates that time has run out, and the dam has failed, is failing, or is about to fail. Imminent Failure typically involves a continuing and progressive loss of material from the dam. It is not usually possible to determine how long a complete breach of a dam will take. Therefore, once a decision is made that there is no time to prevent failure, the Imminent Failure warning must be issued. For purposes of evacuation, emergency management authorities may assume the worst-case condition that failure has already occurred.

Table 5-1 Emergency Level Determination is provided to assist with decision criteria to determine emergency level. The guidance provided in Table 5-1 is intended to function as a framework for IRWD to use to determine when the EAP should be activated but is not prescriptive and each situation will be evaluated on a case-by-case basis.

Table 5-1 Emergency Level Determination

Event	Example Situation	Emergency Level
Erosion of Spillway	Spillway flowing with active erosion gullies	Potential Failure
	Spillway flowing with significant erosion and head cutting advancing rapidly toward reservoir	Imminent Failure
Embankment Overtopping	Reservoir level reaches higher than 472.9 feet NAVD88 and is increasing	Potential failure
	Water from the reservoir is flowing over the top of the dam	Imminent Failure
Seepage	New seepage areas in or near dam	Non-Failure
	New seepage areas with cloudy discharge or increasing flow rate	Potential Failure
	Seepage with increasing and significant flow rate	Imminent Failure
Sinkholes	Observation of new sinkhole in reservoir area or on embankment	Potential failure
	Rapidly enlarging sinkhole	Imminent failure
Embankment Cracking or Settlement	New cracks in embankment greater than 1/4-inch-wide without seepage	Non-Failure
	Cracks in the embankment with seepage	Potential Failure
Embankment Movement	Visual shallow slippage	Non-Failure
	Visual deep-seated movement/slippage of embankment	Potential Failure
	Sudden or rapidly proceeding slides of embankment slope	Imminent Failure
Earthquakes	Measurable earthquake reported within 50 miles of the dam	Non-Failure
	Earthquake resulting in visible damage to dam or appurtenances	Potential Failure
	Earthquake resulting in uncontrolled release of water over dam or rapidly developing flow through cracks or rapidly developing erosion through increased seepage	Imminent Failure
Fire	Significant fire in the area that affects access to the dam	Non-Failure
Instruments	Instrumentation readings beyond predetermined values	Non-Failure
Outlet System Failure	Releases causing erosion around outlet works	Non-Failure
	Uncontrolled releases through the outlet but the dam's structural integrity is still maintained	Potential Failure
	Uncontrolled releases through the outlet with dam failure imminent	Imminent Failure
Security Threat	Verified bomb threat that, if carried out, could result in damage to the dam	Potential failure
	Detonated bomb that has resulted in damage to the dam or appurtenances	Imminent failure
Sabotage/ Vandalism	Damage that could adversely impact the functioning of the dam	Non-failure
	Damage that has resulted in seepage flow	Potential failure
	Damage that has resulted in uncontrolled water release	Imminent failure

5.2 Step 2: Notification and Communication

After the emergency level at the dam has been determined, notifications are made in accordance with the appropriate notification flowcharts in Section 3. The notification flowcharts were prepared to assist EAP response personnel during an emergency. Each chart identifies who is responsible for notifying representatives and/or emergency management officials; the prioritized order in which individuals are to be notified; and who is to be notified. A contact list for the flowchart contacts, as well as other affected parties is found in Section 3.2.

During a dam safety incident, the observer of the dam incident will call 911 and/or the dam operator. If local 911 (primary local emergency management) is called first, they will then notify the dam operator. If the dam operator is notified first, they will ensure that primary local emergency management is also aware of the situation. Once the appropriate emergency level has been determined, the flowchart corresponding to that level will be used to inform affected parties of the situation as it progresses. Parties at the start of each branch are responsible for making all calls within that branch, in the order indicated. Positive contact is required. If it is not possible to contact a particular party based on the information given in the flowchart, the notifying party should refer to the contact table provided in Section 3.2.

The notification flowcharts (Section 3.1) require that the primary local emergency management agency, Newport Beach Police Department, make additional calls as part of the notification process. To ensure that notifications are made in a timely manner, multiple staff members, including dispatchers and other personnel, will be available to make notification calls for Newport Beach Police Department. Newport Beach Police Department has agreed to perform the responsibilities in the notification flowcharts and in this EAP. These instructions will be updated annually when the plan is reviewed and contacts are updated (see Section 8.1).

When performing notification and communication activities, it is important that people speak in clear, non-technical terms to ensure that those being notified understand what is happening at the dam, what the current emergency level is, and which actions to take. To assist in this step, pre-scripted messages are available in Appendix E. To ensure timely and efficient notifications during a rapidly developing emergency situation, verbal notifications via phone calls will be short and direct, followed by email confirmations containing the language in the pre-scripted messages (Appendix E). Additionally, fill out the Cal OES Warning Center Dam Incident Report (Appendix I) and use it for initial notifications.

Use the Contact Log (Appendix D) to track required notifications that are attempted or made. The contact information on each notification flowcharts must be updated annually by the dam owner's/operator's representative.

In the event of an emergency, IRWD will coordinate closely with emergency management authorities. Communication between IRWD and emergency management authorities may be facilitated by the County and OA Joint Information System (JIS) as described in the County and OA EOP. All parties must understand that the formal declaration of public emergency by emergency management authorities can be a very difficult decision. During this step, IRWD will provide any information that will assist in that decision. An early decision and declaration are critical to maximizing available response time.

5.3 Step 3: Emergency Actions

After the initial notifications have been made, IRWD will act to save the dam and minimize impacts to life, property, and the environment. Depending on the nature of the incident, a Unified Command may be established by the Newport Beach Police Department and Newport Beach Fire Department, and an ICP may be established to coordinate emergency response and/or evacuations. The Unified Command could be extended to include the Irvine Police Department and OCFA. The City of Newport Beach may activate their EOC.

During this step, there is a continuous process of taking actions, assessing the status of the situation, and keeping others informed through communication channels established during the initial notifications. Additional resources may be requested through the ICP, City of Newport Beach EOC, or County and OA EOC if requirements exceed the resources available to IRWD.

Table 5-2 Possible Remedial Actions provides the dam owner/operator with a set of actions to take for different events. The actions listed are not all inclusive of those that may need to be taken during an emergency. Use the Emergency Incident Log (Appendix F) to document the emergency event.

Table 5-2 - Possible Remedial Actions

Condition	Description of Condition	Action to be Taken
<p>Large Spillway Release/High Water Level</p>	<p>Reservoir level reaches elevation 472.9 feet NAVD88 (spillway begins to discharge).</p>	<p>1. Cease filling operations unless overfilling and spillway discharge is planned. Close inlet valves.</p>
		<p>2. If inlet valves have malfunctioned and cannot be closed, contact maintenance crews for immediate repair. Determine if inlet flowrate exceeds the spillway discharge capacity. If not, monitor spillway for signs of excessive erosion, and determine whether a high flow condition may exist downstream. Make notifications as appropriate.</p>
<p>Seepage</p>	<p>Localized new seepage or boils observed along downstream face / toe of earthen embankment with muddy discharge and increasing but controllable discharge of water</p>	<p>1. Measure and record feature dimensions, approximate flow rate, and relative location to existing surface features. Take photos if camera is available. Document location on a site plan and in inspection report.</p>
		<p>2. Place a ring of sand bags with a weir at the top towards the natural drainage path to monitor flow rate. If boil becomes too large to sand bag, place a blanket filter over the area using non-woven filter fabric and pea gravel. Attempt to contain flow in such a manner (without performing any excavations) that flow rates can be measured. Stockpile gravel and sand fill for later use, if necessary.</p>
		<p>3. Inspect the dam and collect piezometer, water level and seepage flow data daily unless otherwise instructed by engineer. Record any changes of conditions. Carefully observe dam for signs of depressions, seepage, sinkholes, cracking or movement.</p>
		<p>4. Contact geotechnical engineer and provide all data collected.</p>
		<p>5. Maintain continuous monitoring of feature. Record measured flow rate and any changes of condition, including presence or absence of muddy discharge.</p>

Condition	Description of Condition	Action to be Taken
Seepage (cont.)	Localized new seepage or boils (cont.)	6. Review information collected by field inspection and provide additional instructions / actions as required. Recommend remedial seepage and stability measures.
		7. Make notifications if condition worsens such that failure is imminent.
Sabotage and Miscellaneous Other Issues	Criminal action with significant damage to embankment or structures where significant repairs are required and the integrity of the facility is compromised – condition appears stable with time.	1. Contact law enforcement authorities and restrict all access (except emergency responders) to dam. Restrict traffic on dam crest to essential emergency operations only.
		2. Assess extent of damage and visually inspect entire dam for additional less obvious damage. Based on inspection results, confirm if extent of damage to various components of the dam warrants revised emergency level and additional notifications.
		3. Perform additional tasks as directed by the Engineering Supervisor or designee.
		4. Make notifications if conditions worsen.
Earthquakes	Report of an earthquake epicenter within 50 miles	Inspect dam and evaluate the damage sustained and the potential danger of failure. Check for seepage, cracks, displacements, and settlement. Inspect outlet works and spillways. Evaluate instrumentation.
Erosion of Spillway	Erosion or undermining of concrete spillway	Provide temporary protection at the point of erosion by placing sandbags, riprap materials, or plastic sheets weighted with sandbags. Consider pumps and siphons to help reduce the water level in the reservoir. When inflow subsides, lower the water level in the reservoir to a safe level; continue operating at a lower water level to minimize spillway flow.
Fire		Implement fire procedures (if applicable).

Condition	Description of Condition	Action to be Taken
Abnormal Instrumentation Reading	Piezometers, monuments, and seepage measurements are outside of established dam safety parameters.	Conduct daily inspections of the dam. Check and record reservoir elevation, rate at which reservoir is rising, weather conditions (past, current, forecasted), discharge conditions of creeks/rivers downstream, and new or changed conditions associated with this event. Evaluate accuracy of instrumentation.
Outlet System Failure	Failure of the outlet system piping at a point inside the dam foundation.	Implement temporary measures to protect the damaged structure, such as closing the inlet. Lower the water level in the reservoir to a safe elevation, possibly by using pumps or siphons. Consider the severity of flow through outlet, risk to the dam foundation/liner and increased flows in determining emergency level.
Embankment Deformation	<p>Cracks: New longitudinal (along the embankment) or transverse (across the embankment) cracks more than 6 inches deep or more than 3 inches wide or increasing with time. New concave cracks on or near the embankment crest associated with slope movement.</p>	<ol style="list-style-type: none"> 1. Measure and record feature dimensions, approximate flow rate, and relative location to existing surface features. Take photos if camera is available. Document location on a site plan and in inspection report. 2. Restrict traffic on dam crest to essential emergency operations only. 3. Contact geotechnical engineer and provide all data collected. 4. Place buttress fill (min 3 ft. high, 15 ft. wide) against base of slope immediately below surface feature and extending 20 ft. beyond visible feature limits (parallel to the embankment). Stock pile additional fill. 5. Place sand bags as necessary around crack area to divert any storm water runoff from flowing into crack(s). 6. Inspect the dam; collect piezometer and water level data twice daily unless otherwise instructed by engineer; and record any changes of condition. Carefully observe dam for signs of depressions, seepage, sinkholes, cracking or movement. 7. Review information collected by field inspectors and provide additional instructions / actions as required. Consider survey monitoring. 8. Make notifications if conditions worsen such that failure is imminent.

Condition	Description of Condition	Action to be Taken
<p>Embankment Deformation (cont.)</p>	<p>Slides / Erosion: Deep slide / erosion (greater than 2 feet deep) on the embankment that may also extend beyond the embankment toe but does not encroach onto the embankment crest and appears stable with time.</p>	<p>1. Measure and record feature dimensions, approximate flow rate, and relative location to existing surface features. Take photos if camera is available. Document location on a site plan and in inspection report.</p>
		<p>2. Restrict traffic on dam crest to essential emergency operations only.</p>
		<p>3. Contact geotechnical engineer and provide all data collected.</p>
		<p>4. Re-establish embankment fill slope. Place 5 ft. high buttress fill against base of slope at the slide location that extends at least 15 ft. beyond the furthest downstream limits (perpendicular to the embankment) and extending 20 ft. beyond visible feature limits at either end (parallel to the embankment).</p>
		<p>5. Place sand bags as necessary around slide area to divert any storm water runoff from flowing into slide(s).</p>
		<p>6. Inspect the dam; collect piezometer and water level data daily unless otherwise instructed by engineer; and record any changes of condition. Carefully observe dam for signs of depressions, seepage, sinkholes, cracking or movement.</p>
		<p>7. Review information collected by field inspectors and provide additional instructions / actions as required. Consider survey monitoring.</p>
		<p>8. Make notifications if conditions worsen such that failure is imminent.</p>
	<p>Sinkholes: Small depression observed on the embankment or within 50 feet of the embankment toe that is less than 5 feet deep and 30 feet wide or which is increasing with time.</p>	<p>1. Lower reservoir elevation.</p>
		<p>2. Measure and record feature dimensions, approximate flow rate, and relative location to existing surface features. Take photos if camera is available. Document location on a site plan and in inspection report.</p>
<p>3. Restrict traffic on dam crest to essential emergency operations only.</p>		
<p>4. Contact geotechnical engineer and provide all data collected.</p>		

Condition	Description of Condition	Action to be Taken
<p>Embankment Deformation (cont.)</p>	<p>Sinkholes (cont.):</p>	<p>5. Backfill the depression with relatively clean earth fill (free of organic materials) generally even with surrounding grade and slightly mounded (6 to 12 inches higher) in the center in order to shed storm water away from the depression. Stock pile additional fill.</p>
		<p>6. Inspect the dam; collect piezometer and water level data daily unless otherwise instructed by engineer; and record any changes of condition. Carefully observe dam for signs of depressions, seepage, sinkholes, cracking or movement.</p>
		<p>7. Review information collected by field inspectors and provide additional instructions / actions as required. Consider remedial construction such as grouting.</p>
		<p>8. Make notifications if conditions worsen such that failure is imminent.</p>

5.4 Step 4: Termination and Follow-up

Once conditions indicate that there is no longer an emergency at the dam site, EAP operations are terminated and follow-up actions are completed. Generally, IRWD or a designated safety expert will be responsible for notifying the Unified Command/IC that the condition of the dam has been stabilized.

The IRWD General Manager, in consultation with the IRWD operations and engineering staff members, dam safety experts, and response personnel, is responsible for determining when the dam safety situation has stabilized. The General Manager will terminate the EAP, which signifies that the dam incident has been resolved at the dam site.

The IRWD Director of Water and Recycling Operations, or designee, will follow the notification flowchart to alert all contacts of the EAP's termination. All contacts will be notified of the EAP termination in the same order as they were notified of its activation, using the notification flowchart. The Director of Water and Recycling Operations will complete the Termination Log (Appendix G).

The Unified Command/IC is responsible for terminating the field level emergency response and relaying this decision to appropriate individuals and agencies. Prior to the termination of an Imminent Failure event that has not caused actual dam failure, DSOD will inspect the dam to determine whether any damage has occurred that could potentially result in loss of life, injury, or property damage.

Post incident, the EAP Coordinator will set up and facilitate a meeting to review the incident and EAP implementation activities. The dam personnel involved with the plan implementation, as well as the responding agencies should be present at the meeting. The following topics will be discussed and evaluated in an after-action review:

- Events or conditions leading up to, during, and following the incident
- Significant actions taken by each participant and improvements for future emergencies
- All strengths and deficiencies found in the incident management process, materials, equipment, staffing levels, and leadership
- Corrective actions identified and a planned course of action to implement recommendations

IRWD will prepare an after-action report (Appendix H), which analyzes what happened, why it happened, and how it can be prevented in the future from a dam safety and/or EAP perspective. The Newport Beach Police Department and Newport Beach Fire Department may prepare separate after-action reports focused on localized emergency response and evacuation. Outside agencies will be invited to contribute to the after-action report, and findings of the report will be used to improve the EAP.

Section 6: General Responsibilities

6.1 Irvine Ranch Water District (IRWD) Responsibilities (Dam Owner)

Overall IRWD dam owner responsibilities include:

- Detect, verify and assess emergency conditions.
- Respond to emergencies at the dam site.
- Activate and implement the San Joaquin Reservoir Dam EAP, including determining the appropriate emergency level.
- Notify other participating emergency management agencies of emergency conditions, emergency level, EAP activation, and other critical information.
- Utilize IRWD EOP for internal emergency response coordination.
- Take corrective action at the dam/reservoir.
- Terminate the EAP.
- Facilitate an after-action evaluation and report.
- Update EAP on at least an annual basis.
- Communicate with the public and the media.

The above responsibilities are to be executed in coordination with emergency management authorities. Dam owner responsibilities by role are outlined in *Table 6-1 Summary of Dam Owner's Responsibilities*. Responsibilities are listed for key personnel including the Director of Water and Recycling Operations, Dam Operator, Executive Director of Operations, General Manager, IRWD Communications office, Dam Safety Engineer, and EAP Coordinator.

IRWD, as the dam owner and operator, is responsible for developing and maintaining the EAP. This includes updating the EAP on at least an annual basis, including updating contact information and notification charts in Section 3. The dam owner is responsible for regular monitoring and inspections of the dam and for responding to emergencies at the dam.

As the dam owner, IRWD will carry out notifications as outlined in Section 6.2, including to the primary local emergency management, state emergency management, and the NWS. Notification charts and procedures are given in Section 3. IRWD's Communications office will communicate with the public and the media using the IRWD Crisis Communications Plan. If needed, IRWD will procure outside equipment and materials to aid with a dam incident or emergency.

Table 6-1 Dam Owner Responsibilities by Role

Role	Responsibilities
Director of Water and Recycling Operations, or designee	<ol style="list-style-type: none"> 1. Detect incident from alarms / SCADA / visual inspections, or other monitoring data. 2. As soon as an emergency event is observed or reported, determine the emergency level as detailed in Section 5. 3. Utilize the emergency notification flowcharts in Section 3 to notify the appropriate response personnel and record notifications in the contact log in Appendix D. 4. If no one is onsite, determine emergency level and dispatch operator to the site 5. Coordinate directly with the Unified Command/IC or first responders at the dam site. 6. Coordinate directly with the ICP, City of Newport Beach EOC, or County and OA EOC, if established. 7. Coordinate with Dam Operator on gate, valve operations and emergency procedures 8. Dispatch construction and maintenance crews as necessary 9. Procure outside equipment and materials as necessary 10. Participate in periodic status report conference calls initiated by the Executive Director of Operations. 11. Upon termination of EAP by General Manager, notify all entities on notification charts 12. Upon termination of EAP by General Manager, fill out a Dam Emergency Termination Log (Appendix G) 13. Participate in the creation of an After-Action Report (Appendix H) to be used in the EAP review process.
Dam Operator/ On-site Monitor	<ol style="list-style-type: none"> 1. Detect/confirm incident at dam 2. Make calls on notification charts 3. Implement gate and valve operations and other emergency procedures 4. Assess need for construction and maintenance crews and/or outside equipment and materials 5. Coordinate dam site security during incident
Executive Director of Operations	<ol style="list-style-type: none"> 1. Initiate periodic status report conference calls with Director of Water and Recycling Operations, General Manager, Communications, Dam Safety Engineer, and Director of Safety and Security. 2. Provide regular status reports to ICP, City of Newport Beach EOC, or County and OA EOC, if established through the IRWD Agency Representative or Communications. 3. Coordinate with Communications office
General Manager	<ol style="list-style-type: none"> 1. Participate in periodic status report conference calls initiated by the Executive Director of Operations. 2. Terminate the EAP. 3. Coordinate with Communications office

Role	Responsibilities
Communications	<ol style="list-style-type: none"> 1. Mobilize to Newport Beach EOC, or County and OA EOC, if established. 2. Participate in periodic status report conference calls initiated by the Executive Director of Operations 3. Provide input to staff on emergency communications 4. Represent IRWD to media 5. Develop non-technical description of dam emergency situation and IRWD remedial actions to inform emergency management authorities and the public 6. Utilize Crisis Communications Plan to communicate with impacted areas.
Dam Safety Engineer	<ol style="list-style-type: none"> 1. Make calls on notification charts 2. Initiate periodic status report conference calls with DSOD. 3. Participate in periodic status report conference calls initiated by the Executive Director of Operations 4. Coordinate with Dam Operator/On-site Monitor. 5. Monitor and review data relevant to dam emergency situation. 6. Notify government authorities when the dam condition has been stabilized. 7. Coordinate with dam safety experts. 8. Maintain and update inundation maps. 9. Manage and implement dam safety program.
EAP Coordinator/ Director of Safety and Security	<ol style="list-style-type: none"> 1. Make calls on notification charts 2. Initiate periodic status report conference calls with State Emergency Management. 3. Participate in periodic status report conference calls initiated by the Executive Director of Operations 4. Notify government authorities when the dam condition has been stabilized. 5. Update EAP at least annually 6. Distribute EAP copies/updates to other plan holders 7. Facilitate the creation of an After-Action Report (Appendix H) 8. Coordinate with WEROC <p><i>(see Section 6.5 for additional information)</i></p>

6.2 Notification and Communication Responsibilities

IRWD, as the dam owner/operator will determine the appropriate emergency level in accordance with Section 5, and then notify the appropriate emergency management authorities in accordance with Section 3. The dam operator or IRWD operations center will maintain the contact log (Appendix D) to document notifications for the appropriate emergency level.

IRWD’s Director of Water and Recycling Operations will notify the NWS of an emergency at San Joaquin Reservoir Dam. Flood warnings and watches will be issued by the San Diego Weather Forecast Office of the NWS. IRWD’s Dam Safety Engineer will notify DSOD and the DWR Flood Operations Center. IRWD’s Director of Safety and Security will notify the CalOES Warning Center (see notification charts in Section 3.1).

IRWD’s Communications office will be responsible for communication with the media. IRWD has prepared a Crisis Communications Plan to facilitate providing timely and accurate information and instructions to minimize injuries, impacts on people and property, and potential damage to the environment. The plan outlines how IRWD will provide timely, accurate, wide-

reaching, and easy-to-understand information to the media and the public, as well as to IRWD employees, contractors, board members and other stakeholders.

If time allows, onsite personnel may be able to seek internal advice and assistance. However, under an Imminent Failure condition, the responsibility and authority for notification is delegated to the dam operator or local official. Notification protocols are determined by the classification level of the incident and are pre-determined in the notification flowcharts found in Section 3.

IRWD is designated as the lead agency for notification and coordination with the City of Newport Beach to initiate required response actions including the appropriate notifications to impacted community members. The City of Newport Beach may establish a Unified Command in order to coordinate between multiple jurisdictions and/or agencies, as required. Once notified of an incident at the dam, the City of Newport Beach EOC may be activated to serve as the center for response, warning, and evacuation activities. In most cases, the County and OA EOC is not expected to be activated for an emergency at San Joaquin Reservoir Dam. However, since no emergency response situation is completely predictable, there may be situations where the County and OA EOC may be activated and staffed based on the situation.

Emergency management authorities with statutory obligations are responsible for warning and evacuation within the affected areas (see Part II Inundation Maps).

Emergency incident logs should be used to document incident related events and should be maintained at command centers and at the dam site or dam operations center. Appendix F contains an example emergency incident log.

6.3 Evacuation Responsibilities

Inundation maps developed by IRWD and approved by DSOD are included in Part II of this EAP and have been distributed to the emergency management authorities listed in the notification flowcharts in Section 3. The EAP distribution list may be found in Appendix C. These maps inform the development and refinement of warning and evacuation plans, and are based on the worst-case scenario of a complete and sudden failure of the dam when it is filled to the spillway crest elevation during a “sunny day” failure, without additional storm flows in Bonita Creek or San Diego Creek. Water levels in the San Joaquin Reservoir fluctuate throughout the year.

Inundation maps are based on conservative breach parameters and a situation where the reservoir is storing the maximum capacity of water. Therefore, the inundation maps included in Part II of this EAP should be considered a worst-case scenario. Emergency planners and response personnel should consider the specifics of each situation when making response decisions during a dam emergency. The Unified Command/IC will facilitate coordination among agencies and disciplines for evacuations within the affected area.

The Newport Beach Police Department and Newport Beach Fire Department would have responsibility for evacuations within the City of Newport Beach.

Because the flood wave for a failure of the dam at San Joaquin Reservoir would be entirely confined to the San Diego Creek channel by the time it reached the city limits of Irvine, it is not anticipated that City of Irvine would assume any evacuation responsibilities. However, if evacuations are needed, the Irvine Police Department and OCFA would be responsible for providing an effective emergency response in compliance with existing city evacuation plans and direction from the Unified Command/IC.

OCSD, which is not part of the Unified Command, may be called upon by the Unified Command to assist with evacuations, if necessary.

6.4 Monitoring, Security, Termination, and Follow-up Responsibilities

The dam operator or an appointed representative will be designated as the onsite monitor from the beginning of a dam safety incident until the emergency has been terminated. This person will provide status updates to the IRWD Director of Water and Recycling Operations, who will provide regular status reports to senior management and local authorities.

During a dam safety incident, the IRWD onsite monitor will oversee security at the dam site. Access to the dam site will be strictly controlled by IRWD. Only those required to respond to the emergency or execute remedial actions will be granted access to the site.

Termination of a dam safety emergency is twofold. The IRWD General Manager, in consultation with IRWD operations and engineering staff members, dam safety experts, and response personnel, is responsible for determining when the dam safety situation has stabilized. The IRWD General Manager will officially terminate the EAP. The Unified Command/IC is responsible for termination of the emergency response activities, including termination of an evacuation.

The dam owner and emergency response authorities should coordinate closely while making decisions to terminate both the dam safety event and the response efforts. Upon termination of the EAP, IRWD will notify all flowchart entities which were activated at the start of the emergency incident, and complete an Emergency Termination Log (Appendix G) for submission to DSOD and the Cal OES Warning Center (if notified).

Recovery activities will continue on different levels for all involved in the dam safety incident after the emergency has been terminated. IRWD will coordinate a follow-up evaluation after any emergency and prepare an after-action report. All participants in the dam safety incident should be involved in the evaluation and should keep logs during the incident. An example emergency incident log is provided in Appendix F, although emergency response agencies may maintain alternate documentation methods according to their established internal procedures.

IRWD will prepare an after-action report (Appendix H), which analyzes what happened, why it happened, and how it can be prevented in the future from a dam safety and/or EAP perspective. The Newport Beach Police Department and Newport Beach Fire Department may prepare a separate after-action reports focused on localized emergency response and evacuation. Outside

agencies will be invited to contribute to the after-action report, and findings of the report will be used to improve the EAP.

6.5 EAP Coordinator Responsibilities

IRWD has designated the IRWD Director of Safety and Security as the EAP Coordinator. The EAP coordinator is responsible for overall EAP related activities, including the following:

- Provide leadership to ensure the EAP is reviewed and updated annually.
- Coordinate annual EAP exercises (see Section 7.2.2 for exercise schedule).
- Summarize the annual EAP exercise for posting to the IRWD website.
- Prepare revisions to the EAP after annual exercise and review.
- Verify and update agency contact information.
- Distribute copies of the revised EAP to all parties who received copies of the original EAP.
- Establish training seminars for IRWD personnel and primary emergency management authorities.
- Coordinate emergency outreach programs with residents and businesses in close proximity to the reservoir.
- After a dam safety incident, hold a meeting to review the incident and EAP implementation activities.
- Facilitate the creation of an After Action Report (Appendix H) after a dam incident by gathering incident information from authorities.
- Utilize any After Action Reports during EAP review process.

The EAP Coordinator is the main point of contact for any questions or comments regarding this EAP. The current EAP Coordinator for IRWD can be reached at:

Steve Choi, Director of Safety and Security
Irvine Ranch Water District
3512 Michelson Drive
Irvine, CA 92612-1799

Phone numbers and email addresses have been removed from this publicly posted copy of this Emergency Action Plan. That information is available from Irvine Ranch Water District's district secretary: Phone 949-453-5300, Email Comments@IRWD.com

Section 7: Preparedness

7.1 Surveillance and Monitoring

This EAP establishes the procedures to be employed by IRWD personnel to ensure the safety of life and property at and downstream of San Joaquin Reservoir Dam. The Water Operations Manager is responsible for the day to day operation of the reservoir and the dam surveillance and monitoring program. Operations are supported by IRWD maintenance activities. There is a dam keeper who resides at the reservoir and is responsible for maintaining a presence at the dam, monitoring water levels, ensuring the facility is properly secured, and conducting visual inspections. The reservoir is a source of supply for the recycled water system, and is generally filled during the day and drawn down at night. During the winter, demand is much lower, and the reservoir is generally full. IRWD maintains a surveillance and inspection program for the San Joaquin Reservoir Dam that is described in the sections that follow. Monitoring and surveillance data is reviewed by an independent consultant and annual reports are prepared and maintained on file with IRWD. The reservoir site plan is included as Figure 7-1.

7.1.1 SCADA

IRWD has a supervisory control and data acquisition (SCADA) system that allows staff to remotely monitor water levels and alarms at San Joaquin Reservoir Dam.

7.1.2 Survey Monuments

Annual surveys of the dam are conducted and compared to historical data. A cumulative settlement plot is maintained that indicates any movement of the monuments over time. Lateral or vertical shifting of the monuments is indicative of a potential dam safety issue and requires further investigation. DSOD reviews the annual surveys. A schematic drawing showing the survey monuments is included as Figure 7-2.

7.1.3 Piezometers

A piezometer is a small-diameter well used mainly to measure water levels. The water levels in the piezometers at San Joaquin Reservoir Dam are measured by IRWD personnel on a daily basis. Water levels in the piezometers are compared to reservoir surface water elevations and evaluated against data collected over a 10-year historical period. Anomalies in the piezometer data may be an indication of adverse conditions in the dam embankment or abutments. The piezometer locations are shown in Figures 7-3 and 7-4.

7.1.4 Monitoring Wells

There are several monitoring wells located near the dam. Water levels in the wells are monitored monthly and are compared to reservoir surface water elevations and evaluated against data collected over a 10-year historical period. Anomalies in the water level data may be an indication

of adverse conditions in the dam embankment or abutments. The monitoring well locations are shown in Figures 7.4 and 7.5.

7.1.5 Seepage Points

There are several seepage monitoring stations at the dam. They are monitored on a monthly basis by IRWD, and compared to historical observations. Anomalies at the seepage points may be an indication of adverse conditions at the dam.

7.1.6 Visual Surveillance and Monitoring

Visual inspections are conducted daily by the dam operator that consist of monitoring the water surface elevation, inspecting visible appurtenances, inspecting the access roadway and spillway for cracking, inspecting the downstream toe for seepage, and inspecting the slopes and crest parapet wall for any visible displacement. Any visible cracking, seepage, or signs of settlement or instability are reported and trigger further investigation of the piezometers and monuments or engineering analysis. All of the outlet gates and blow off valves are exercised at least annually to confirm operability. DSOD requires the outlet valves and blow-off valves be exercised once every three years in the presence of a DSOD representative.

Maintenance is conducted as required to remove excessive vegetation at or near the spillway or on the dam face and to control rodent activity on the dam face.

7.1.7 IRWD and DSOD Inspections

IRWD conducts semi-annual inspections. DSOD inspections are conducted annually. Visual inspections of the dam, spillway, outlet, and seepage are conducted, along with a review of monitoring and surveillance data. Annual inspections are documented and maintained on file at both IRWD and with DSOD.

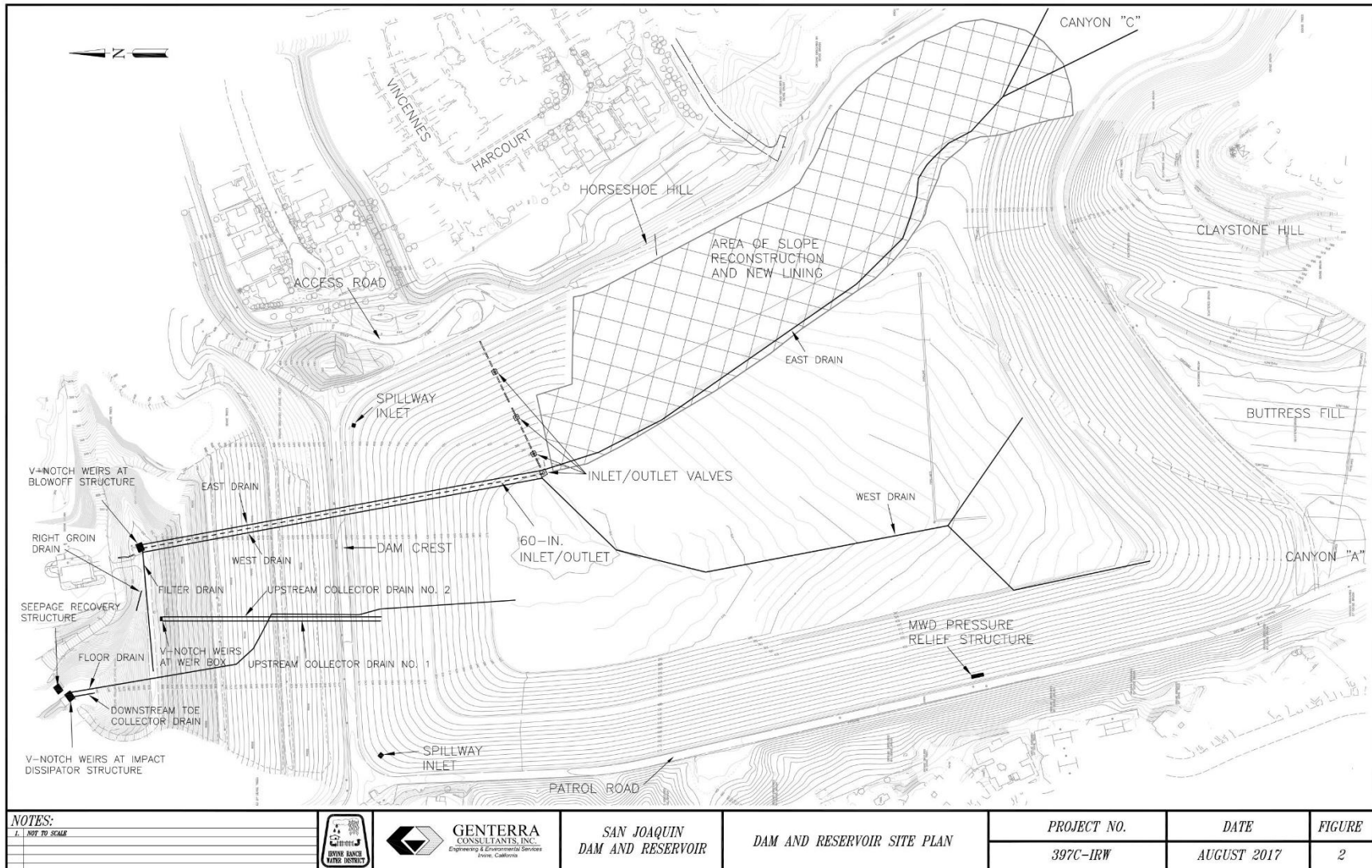


Figure 7-1 San Joaquin Reservoir Site Plan

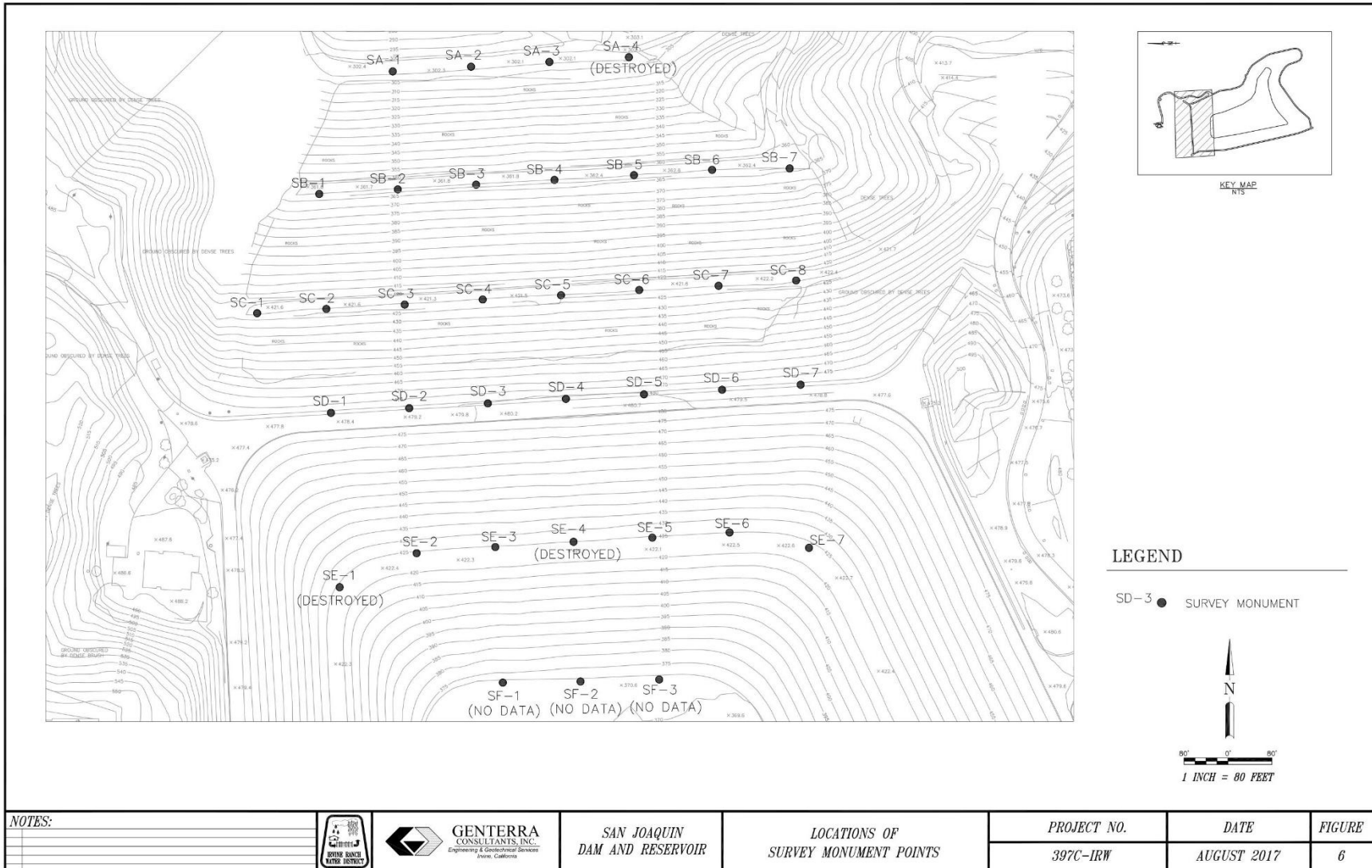


Figure 7-2 San Joaquin Reservoir Survey Monuments

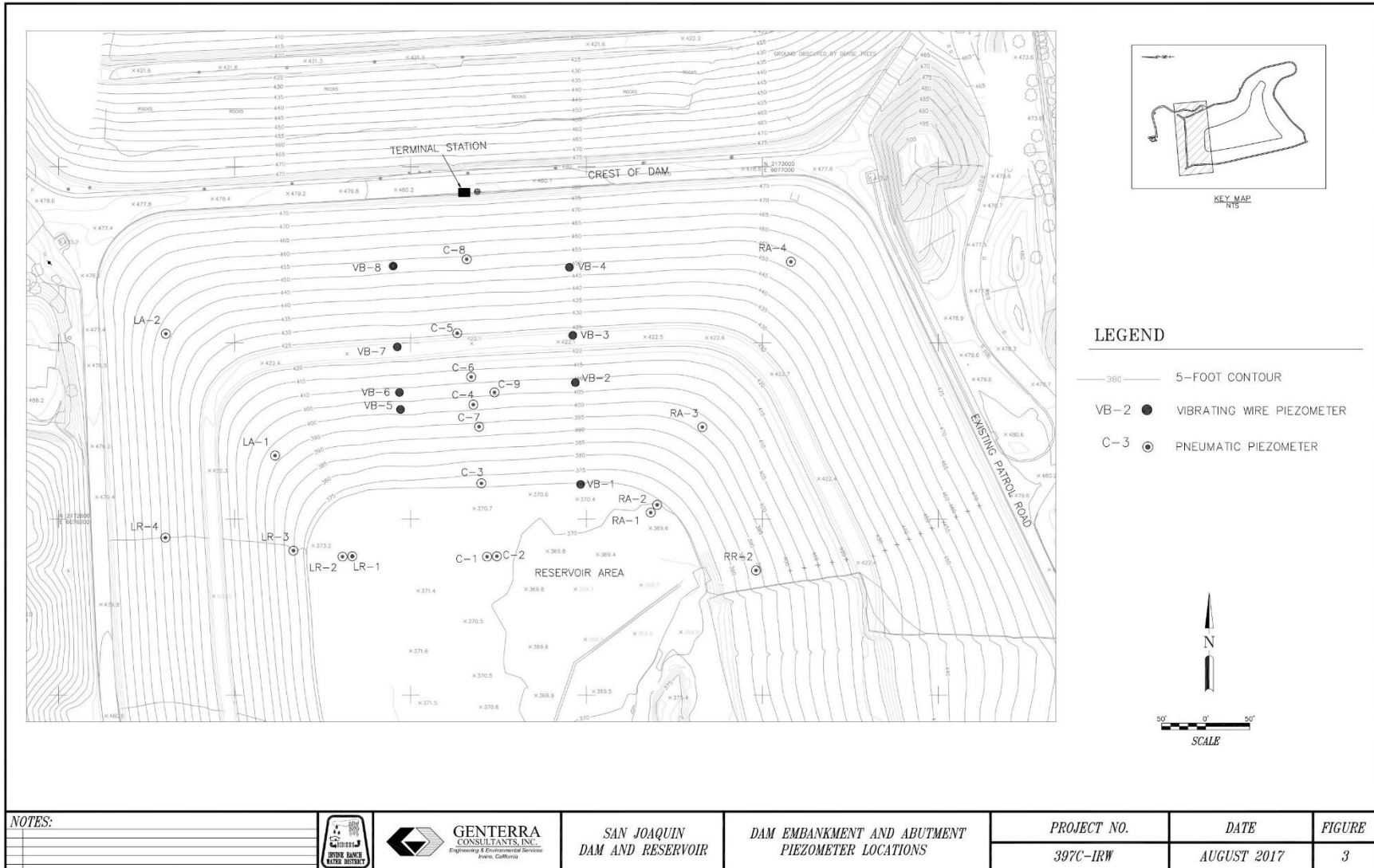


Figure 7-3 San Joaquin Reservoir Vibrating and Pneumatic Piezometers

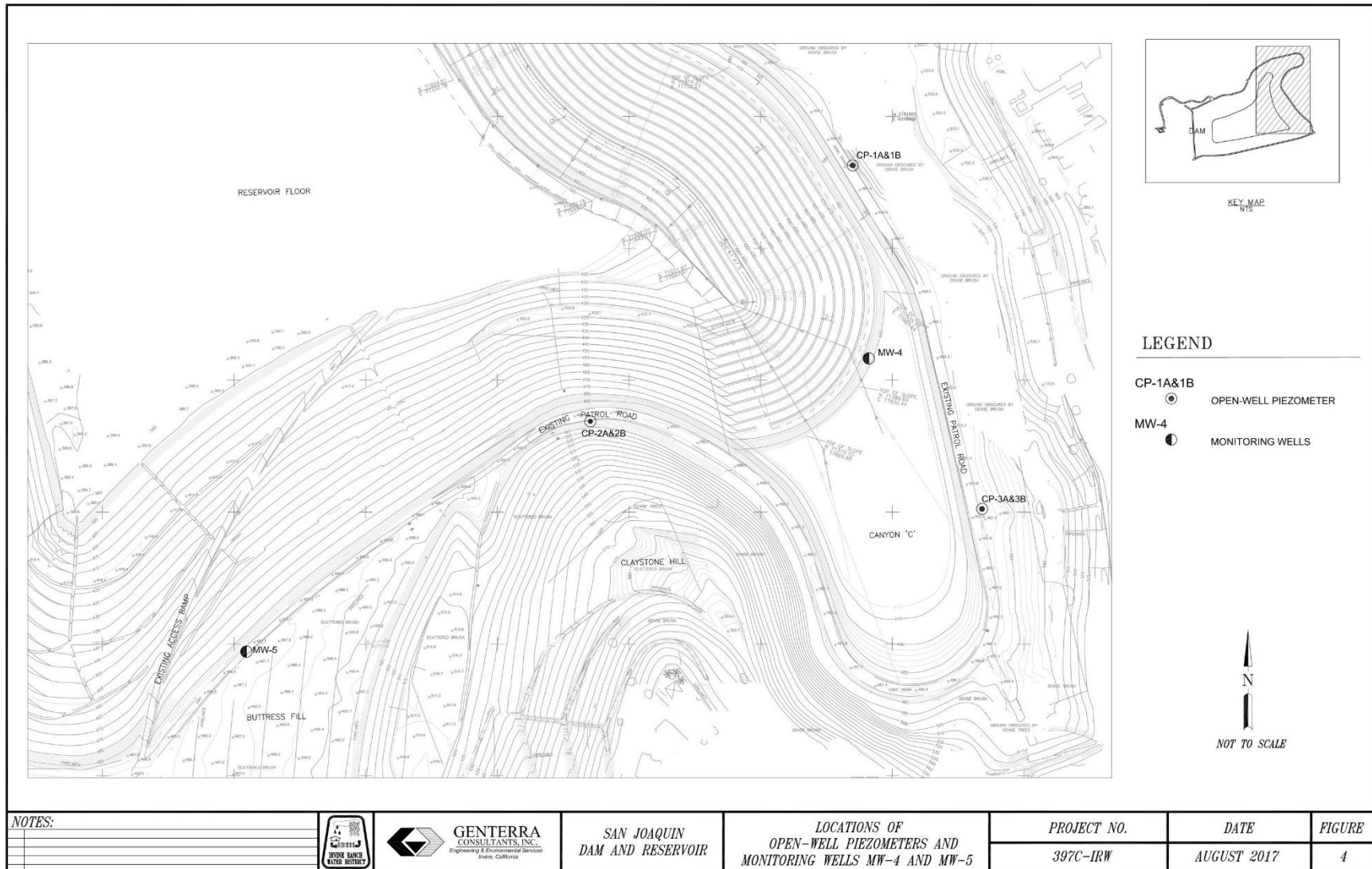


Figure 7-4 San Joaquin Reservoir Open Well Piezometers and Monitoring Wells

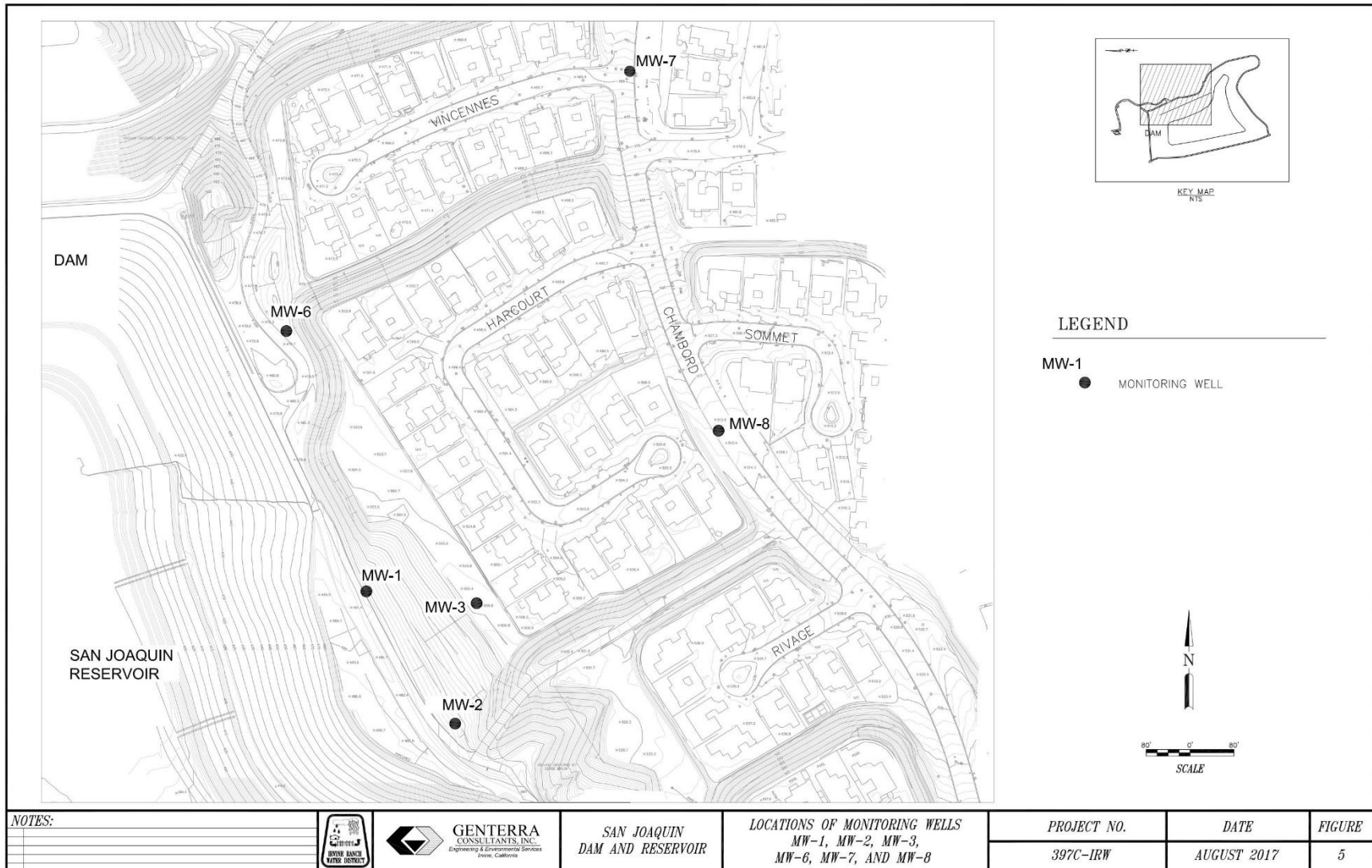


Figure 7-5 San Joaquin Reservoir Monitoring Wells

7.2 Evaluation of Detection and Response Timing

Timely implementation of the EAP and coordination and communication with emergency management authorities are crucial elements in the effectiveness of the emergency response effort. Total EAP implementation time from the initiation of an actual incident to determination of an emergency situation and notification of appropriate entities involved with implementation is evaluated through annual exercises and training. The time from the initial detection of an incident through the determination of the emergency level and execution of the notifications to the appropriate entities is estimated to take 20 minutes. The initial detection and notification time will be evaluated during IRWD's annual review and exercises (see Section 7.2.2) and may be updated in subsequent EAP revisions.

7.2.1 Training

All personnel involved in the EAP should be familiar with the elements of the plan, their responsibilities and duties outlined in the plan and, if applicable, the types and availability of equipment during an emergency. Personnel should be familiar with problem detection and evaluation, and appropriate remediation actions, as detailed in this EAP.

7.2.2 Annual Review and Exercises

IRWD will review and, if needed, update the EAP at least once annually leading up to the emergency action plan notification exercise described below. This review includes contacting all parties listed in this EAP to verify that contact names, phone numbers, addresses and other information is current. One of the most important tasks is to verify and update the contacts listed in the Emergency Notification Flowcharts in Section 3. Making updates to locally available resources along with the other information in the EAP is also important so that accurate information is readily available during an emergency.

In accordance with California Government Code Section 8589.5(c), at least once annually, IRWD will conduct an emergency action plan notification exercise with local public safety agencies, to the extent that a local public safety agency wishes to participate. This annual exercise is to ensure that emergency communications plans and processes are current and implemented effectively.

Exercises will follow the types of exercises defined in the Homeland Security Exercise and Evaluation Program (HSEEP), beginning with simple exercises and advancing to more complex exercises. Sufficient time should be provided between each exercise to learn and improve from the experiences of the previous exercise. IRWD, as the dam owner/operator, will coordinate with the Newport Beach Police Department, Newport Beach Fire Department, Irvine Police Department, OCFA and the OCSD EMD in order to exercise the EAP. Exercises promote prevention, preparedness, and response to incidents and emergencies. Exercises may also be extended to include recovery operations. Periodic exercises result in an improved EAP as lessons learned are incorporated into the updated EAP document. The frequency and level of exercise will be determined in coordination with the cities and the OCSD EMD.

The following are recommended frequencies for the exercise types described in the HSEEP:

- Seminars with primary emergency management authorities as part of the annual emergency action plan notification exercise – annually.
- Drills to test the notification flowcharts in Section 3 and emergency equipment/procedures (emergency action plan notification exercise) – annually.
- Tabletop exercise – every 3 to 4 years or before functional exercises.
- Functional exercise – every 5 years.
- Full scale exercise – as required to evaluate actual field movement and deployment. At least one functional exercise should be conducted before conducting a full-scale exercise.

Functional and full-scale exercises should be coordinated with other scheduled exercises, whenever possible, to share emergency management resources and reduce costs.

7.3 Access to the Site

Access to the San Joaquin Reservoir can be coordinated with the dam operator at the numbers provided in the notification flowcharts in Section 3. Depending on the dam safety incident, IRWD may establish an operations center to coordinate dam safety response activities and provide information to other emergency response personnel. The dam is located in Newport Beach at the end of Ford Road near the intersection of Bonita Canyon Drive and State Route 73. The main access road is located at 2350 Ford Road, Newport Beach, CA 92660. There are also two access points off of Chambord Road and one on Ridgeline Drive. Access to the site is restricted by locked gates at the entrances on Ford Road, Chambord Road, and Ridgeline Drive. The site is also surrounded by fencing. Figure 1.1 provides additional site information.

The primary access road to the site would be entirely inundated during a dam failure. If the primary access point is not available, access points upstream of the dam off of Ridgeline Drive and Chambord Road may be accessible and are not within the inundation area:

- First alternate access point: at 9 Ridgeline Drive, Newport Beach, CA 92660. To access, from Ford Rd, drive south on San Miguel Drive for 0.8 miles and turn left (east) onto Spyglass Hill Rd. Follow for one mile, then turn left (east) on Ridgeline Drive. Follow Ridgeline Drive to the dam access gate located near 9 Ridgeline Drive.
- Second alternate access point: off of Chambord Rd, in between the cross streets of Sommet and Rivage, Newport Beach, CA 92657. To access, from Bonita Canyon Drive, turn south on Chambord Rd, and follow for one mile to the access gate located between Sommet and Rivage streets.

7.4 Response During Periods of Darkness

IRWD maintains a 24-hour emergency response staff to respond to various utility outages and emergency maintenance requirements. Because of the availability of 24-hour emergency response staff and the presence of a dam keeper, the response to an emergency incident during periods of darkness would be 20 minutes, the same as during daylight periods. Notification times would be the same as during daylight hours. Phone numbers in the notification charts are 24-hour contact numbers, so notification procedures during periods of darkness are the same as on weekdays.

Any dam safety incident that requires response actions during periods of darkness may require additional lighting such as portable floodlights. IRWD maintenance and construction personnel can have rental lighting moved to the site in order to respond during times of darkness. Rental lighting equipment is located within 25 miles of the dam and could be moved to the dam site within 2 hours. Additional lighting may also be required by the dam operator in order to perform visual surveillance of a potential or developing situation. Additional lighting options are also available through the IRWD purchasing and contracting department from locally available sources.

7.5 Response During Weekends and Holidays

The dam keeper is generally on site during weekends and holidays, and IRWD staff are available for recall during emergencies. The dam is not attended by the dam keeper during normal work-day hours, from 6 am to 4:30 pm on Monday through Thursday. For slowly developing situations, staff may be recalled and a 24-hour operations center may be established in order to have resources readily available should the situation deteriorate. A rapidly developing situation occurring after hours or during weekends and holidays may require the recall of engineering, maintenance, or other response personnel, and response may be delayed during the recall and mobilization of the IRWD staff. During weekends and holidays, IRWD staff could be onsite to assess a rapidly-developing emergency within 60 minutes. This means that the daytime response time of 20 minutes could be extended by 60 minutes, for a weekend/holiday response time of about 90 minutes.

7.6 Response During Adverse Weather

Periods of adverse weather that have the ability to impact dam safety may require additional staff to be on-call or prepared to execute response actions. The Director of Water and Recycling Operations, in collaboration with the dam operator will make staffing recommendations to IRWD leadership during times of predicted adverse weather. Response time to an emergency situation may be lengthened by 30 minutes during periods of adverse weather. The dam site has vehicle access at four locations. If the primary access to the site is affected by dam failure inundation or heavy rains, there are two other access points that may be used (see Section 7.3 for access points and directions).

7.7 Alternative Sources of Power

At the San Joaquin Reservoir Dam, the pneumatic valves and seepage return lift station require power and do not have a backup generator on-site. All other reservoir operations may be performed manually. IRWD maintains emergency backup generators for use in the district. Generators are located at the MWRP at 3512 Michelson Drive, Irvine, California, 92612, located about four miles north of San Joaquin Reservoir Dam. Generators may be brought to the dam site within 45 minutes.

In the event of an electrical outage, cellular phones may be used for communications in lieu of a telephone land line or computer.

7.8 Emergency Supplies and Information

IRWD maintains emergency supplies and response equipment for many potential response actions. IRWD’s supplies are centrally located at the MWRP at 3512 Michelson Drive, Irvine, California, 92612, located about four miles north of San Joaquin Reservoir Dam. See Section 7.9 for a list of supplies. In the event that the IRWD internal response capabilities are exceeded, *Table 7-1 Locally Available Resources* is provided to aid in securing additional response materials and equipment. The suppliers listed in Table 7-1 are typically open from 7am-5pm Monday through Friday; outside these hours, a dispatcher is typically available to handle after-hours requests. Secondary phone numbers have been listed where available.

Table 7.8-1- Locally Available Resources

	Heavy Equipment Service and Rental	Sand and Gravel Supply	Ready-Mix Concrete Supply
Company	Herc Rentals	PTI Sand and Gravel	National Ready Mix Concrete
Address	3040 E Miraloma Ave Anaheim, CA 92806	14925 River Rd Corona, CA 92676	16282 Construction Dr Ctr Irvine, CA 92606
Phone Numbers			
Contact Person			

*Daytime and after-hours number: calling the main number after hours will route to an on-call employee.

7.9 Stockpiling Materials and Equipment

No equipment is stockpiled at San Joaquin Reservoir Dam. Because IRWD owns several dams, as well as other water facilities, IRWD centralizes its emergency supplies stockpile at the MWRP at 3512 Michelson Drive, Irvine, California, 92612, located about four miles north of San Joaquin Reservoir Dam. Supplies and equipment stockpiled centrally at MWRP are ready for deployment for use anywhere within the District’s boundary. Equipment and supplies stored at MWRP include generators; diesel fuel; construction equipment such as backhoes and excavators; vacuum trucks; compressors; tools; traffic control equipment; non-woven filter fabric; and excavation and backfill materials including sand, crushed rock, pea gravel, and road base material. Equipment at MWRP can generally be moved to the dam site within 45 minutes. Equipment, materials, and supplies required that exceed the IRWD capabilities are locally accessible at the locations in *Table 7-1 Locally Available Resources*. Equipment obtained from third parties listed in Table 7-1 could be obtained within about 2 hours during regular business hours.

7.10 Coordination of Information

In the event of an emergency at San Joaquin Reservoir Dam, IRWD will notify the NWS so that they can issue appropriate flood watches and warnings. Contact numbers and notification procedures for NWS are outlined in Sections 3.1 and 3.2. No extremely high flow, overflow, or emergency flow incidents are known to have occurred at San Joaquin Reservoir Dam.

Phone numbers and email addresses have been removed from this publicly posted copy of this Emergency Action Plan. That information is available from Irvine Ranch Water District’s district secretary: Phone 949-453-5300, Email Comments@IRWD.com

The San Joaquin Reservoir stores recycled water and does not collect significant runoff from upstream. The water level in the reservoir is controlled through input valves, and if a potential or developing dam safety incident requires the lowering of the reservoir level, this must be done in accordance with the standard operating procedures maintained by the MWRP. All actions associated with controlling flow into or out of the reservoir must be coordinated with the dam operator or a representative designated by IRWD.

There are no dams upstream or downstream of San Joaquin Reservoir Dam which would contribute to or be affected by an emergency event at the dam, so no coordination is required with other dams. Big Canyon Dam, a jurisdictional dam owned by the City of Newport Beach, is located about one mile southwest of San Joaquin Reservoir Dam. However, San Joaquin Reservoir and Big Canyon Dams are situated on separate stream channels, and a breach at either dam would not affect the other.

IRWD will work with emergency personnel to keep them up to date on any situation involving the San Joaquin Reservoir Dam. The Director of Water and Recycling Operations may designate staff members to act as liaisons at the ICP, a Unified Command, or at various EOCs, as required.

7.11 Training and Exercise

IRWD operations and maintenance staff receive training to ensure that they are thoroughly familiar with the elements of the EAP and potential response actions. The operations, engineering staff, and appropriate MWRP personnel are trained in the incident management process, including detection, evaluation, notification, and appropriate response actions during all emergency level determinations. IRWD duty staff are trained in notification requirements for dam safety incidents to ensure that the appropriate recall actions are initiated after working hours.

In accordance with California Government Code Section 8589.5(c), at least once annually, IRWD will conduct an emergency action plan notification exercise with local public safety agencies, to the extent that a local public safety agency wishes to participate. This annual exercise is to ensure that emergency communications plans and processes are current and implemented effectively. All contact information in the notification charts will be updated and verified; next, a notification exercise will be conducted to simulate the phone calls required in the notification charts. The timing and procedures in the notification exercise will be noted, and the EAP will be updated based on feedback from the participants.

Because the San Joaquin Reservoir Dam is categorized as an extremely high-risk dam, local emergency management authorities may develop evacuation and shelter-in-place training materials for people who would be affected by a dam failure in their jurisdiction. These requirements and materials will be determined and developed through the review and exercise process described in Section 7.2.

7.12 Alternative Systems of Communication

In the event of a dam safety emergency, the Unified Command/IC and emergency response personnel have access to various forms of alternative communication ranging from social media, radio broadcasts, wireless emergency alerts, and opt-in email and cellphone lists.

IRWD maintains an operations communication architecture for internal communications. Communication at the dam is facilitated by the on-site dam keeper. The dam keeper is able to use a cellular phone, land line telephone, or a computer connected to the internet to communicate with other IRWD personnel and emergency response personnel.

7.13 Public Awareness and Communication

IRWD will utilize already established communication protocols and channels to publish and promote established inter-agency emergency procedures within the affected area. In addition, information on the location of reservoir as well as related emergency procedures will be available on the IRWD website (<https://www.irwd.com/>).

In order to further prepare the public for a dam safety incident IRWD will implement the following measures:

- Educate customers about established IRWD emergency notification systems, which include the ability to text, call or email customers in the event of an emergency such as a dam safety incident.
- Promote the emergency preparedness section on the IRWD website and through various communications channels including the monthly customers billing insert and social media channels.
- Coordinate emergency outreach programs with residents and businesses in close proximity to the reservoir through cities, fire and police departments and the County of Orange.
- Post a map of the inundation area on the IRWD website so that members of the public may see if they live within possible impacted areas.
- Post a summary of the annual EAP exercise on the IRWD website each year.
- Update existing information on dam safety and emergency-preparedness on the IRWD website within one month of the approval of the EAP. After each annual review, updates will be made to the website as necessary.
- Complete outreach to customers through existing outreach channels within 4 months of completion of the EAP.

The timing and frequency of additional outreach measures will be evaluated and updated as part of the annual EAP review.

Section 8: Plan Maintenance

8.1 Plan Review

The EAP Coordinator will review and update the EAP at least once annually leading up to the emergency action plan notification exercise described below. This review includes calling all contact information listed to verify that contact names, phone numbers, addresses and other information is current. One of the most important tasks is to update the contacts listed in the Emergency Notification Flowcharts in Section 3. Making updates to locally available resources along with the other information in the EAP is also important so that accurate information is readily available during an emergency.

In accordance with California Government Code Section 8589.5(c), at least once annually, IRWD will conduct an emergency action plan notification exercise with local public safety agencies, to the extent that a local public safety agency wishes to participate. This annual exercise is to ensure that emergency communications plans and processes are current and implemented effectively.

In accordance with California Water Code section 6161(e), IRWD will update the EAP, including the inundation maps, no less frequently than every 10 years, and sooner under conditions that include: (1) a significant modification to the dam or a critical appurtenant structure and (2) a significant change to downstream development that involves people and property. The inundation maps for this EAP are dated February 2, 2018, and require updating by February 2, 2028.

8.2 Distribution

A status report will be prepared annually that documents the plan review and any exercises that occurred. The EAP will be revised, as required, to incorporate updated information or lessons learned during exercises/event after action reports. Changes will be documented in the revision log in Appendix B, Record of EAP Revisions.

Electronic copies of the EAP Status Report (Appendix A) and revised EAP will be distributed to the EAP Plan Holders annually via email (Appendix C). The EAP Plan Holders include all parties on the notification flowcharts.

To request a copy of the Emergency Action Plan for San Joaquin Reservoir Dam, please contact the EAP Coordinator:

Steve Choi, Director of Safety and Security
Irvine Ranch Water District
3512 Michelson Drive
Irvine, CA 92612-1799

Phone numbers and email addresses have been removed from this publicly posted copy of this Emergency Action Plan. That information is available from Irvine Ranch Water District's district secretary: Phone 949-453-5300, Email Comments@IRWD.com

PART II: Inundation Maps

DEPARTMENT OF WATER RESOURCES

1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791



AUG 20 2019

Mr. Paul Cook, General Manager
Irvine Ranch Water District
Post Office Box 57000
Irvine, California 92619-7000

San Joaquin Reservoir Dam, No. 1029
Orange County

Dear Mr. Cook:

The Division of Safety of Dams (DSOD) has reviewed the inundation map submitted for San Joaquin Reservoir Dam. It was determined that the dam has no critical appurtenant structures and the map listed below is in substantial compliance with the requirements of Title 23, Division 2, Chapter 1, Article 6 of the California Code of Regulations. Therefore, the following inundation map is approved:

1. Main Dam (sunny day failure scenario) map dated February 2, 2018.

The approved map will be made publicly available as required by section 6161(c) of the California Water Code. An emergency action plan (EAP), based on the approved inundation maps, must now be submitted to the California Governor's Office of Emergency Services (Cal OES) for their review and approval. Upon Cal OES approval, please submit an electronic copy of the approved EAP with a hard copy of the transmittal letter to DSOD.

Pursuant to section 6161(e) of the CA Water Code, the EAP and inundation map must be updated no less frequently than every 10 years, and sooner under conditions that include, but are not limited to, the following: (1) a significant modification to the dam or a critical appurtenant structure as determined by the department, or (2) a significant change to downstream development that involves people and property. Based on the requirement, the approved map will expire on February 2, 2028. Please submit the updated map at least six months prior to the expiration date for DSOD's review and approval.

If you have any questions or need additional information, you may contact Design Engineer Dean Smith at (916) 565-7843 or Re-evaluation Engineering Branch Chief Ariya Balakrishnan at (916) 565-7870.

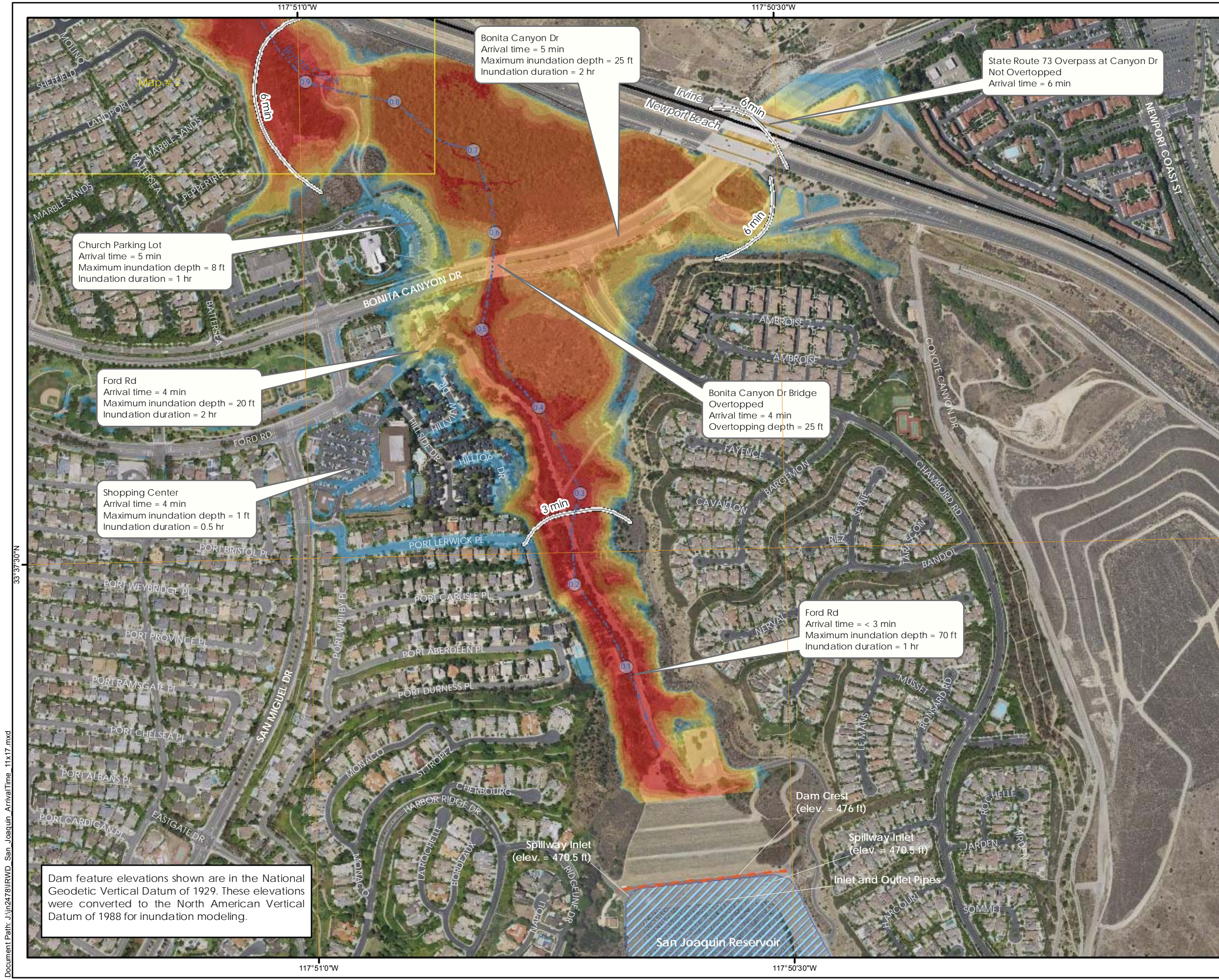
Sincerely,

A handwritten signature in blue ink, appearing to read "Sharon K. Tapia".

Sharon K. Tapia, Chief
Division of Safety of Dams

cc: (See Attached List.)

Main Dam Failure – Maximum Depth and Arrival Time



Bonita Canyon Dr
 Arrival time = 5 min
 Maximum inundation depth = 25 ft
 Inundation duration = 2 hr

State Route 73 Overpass at Canyon Dr
 Not Overtopped
 Arrival time = 6 min

Church Parking Lot
 Arrival time = 5 min
 Maximum inundation depth = 8 ft
 Inundation duration = 1 hr

Ford Rd
 Arrival time = 4 min
 Maximum inundation depth = 20 ft
 Inundation duration = 2 hr

Shopping Center
 Arrival time = 4 min
 Maximum inundation depth = 1 ft
 Inundation duration = 0.5 hr

Bonita Canyon Dr Bridge
 Overtopped
 Arrival time = 4 min
 Overtopping depth = 25 ft

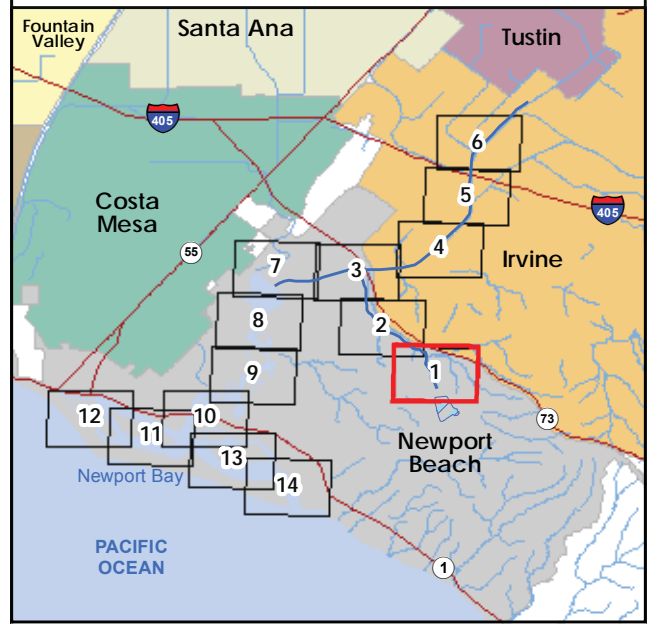
Ford Rd
 Arrival time = < 3 min
 Maximum inundation depth = 70 ft
 Inundation duration = 1 hr

Dam feature elevations shown are in the National Geodetic Vertical Datum of 1929. These elevations were converted to the North American Vertical Datum of 1988 for inundation modeling.

SAN JOAQUIN RESERVOIR DAM INUNDATION MAP

FLOOD ARRIVAL TIME

STATE DAM NO. 1029.000
 NATIONAL DAM NO. CA00853
 ORANGE COUNTY, CALIFORNIA



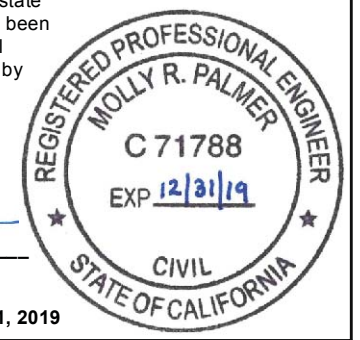
Legend

	Mapbook Page #		0-2 ft		10-20 ft
	San Joaquin Reservoir		2-4 ft		20-30 ft
	Dam Crest		4-6 ft		30-40 ft
	Arrival Time		6-8 ft	>40 ft color swatch"/>	>40 ft
	Creek		8-10 ft		
	City Boundary				
	River Mile				

Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

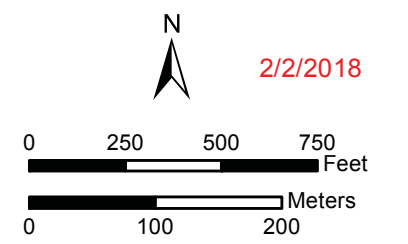
This map meets all applicable state and federal standards and has been prepared in consideration of all potential downstream hazards by a licensed civil engineer.

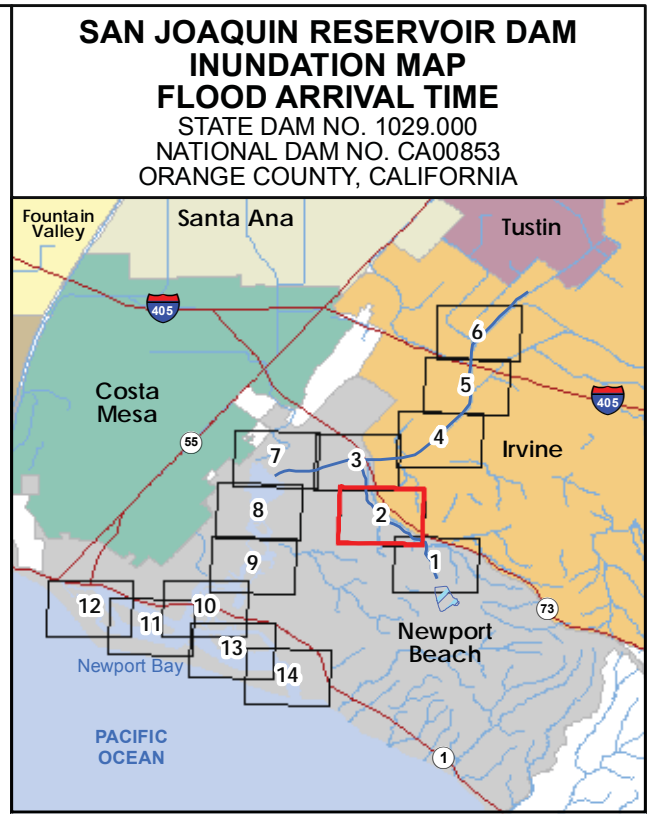
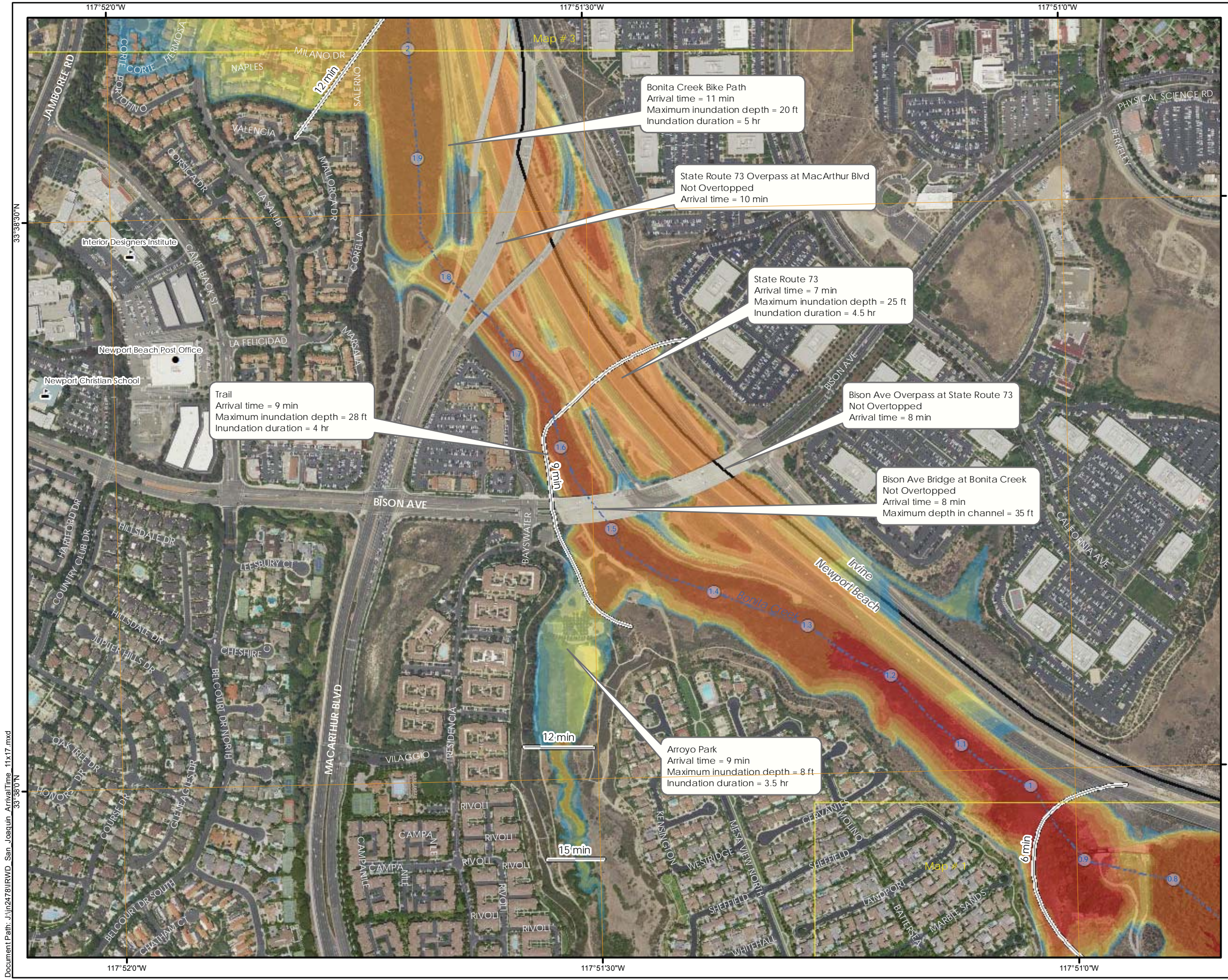
Molly Palmer



Molly Palmer,
 Civil Engineer 71788
 Expiration Date December 31, 2019

PANEL 1 of 14





Legend

	Mapbook Page #		0-2 ft		10-20 ft
	San Joaquin Reservoir		2-4 ft		20-30 ft
	Dam Crest		4-6 ft		30-40 ft
	Arrival Time		6-8 ft		>40 ft
	Creek		8-10 ft		
	City Boundary				
	River Mile				
	School				

Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

This map meets all applicable state and federal standards and has been prepared in consideration of all potential downstream hazards by a licensed civil engineer.

Molly Palmer,
 Civil Engineer 71788
 Expiration Date December 31, 2019

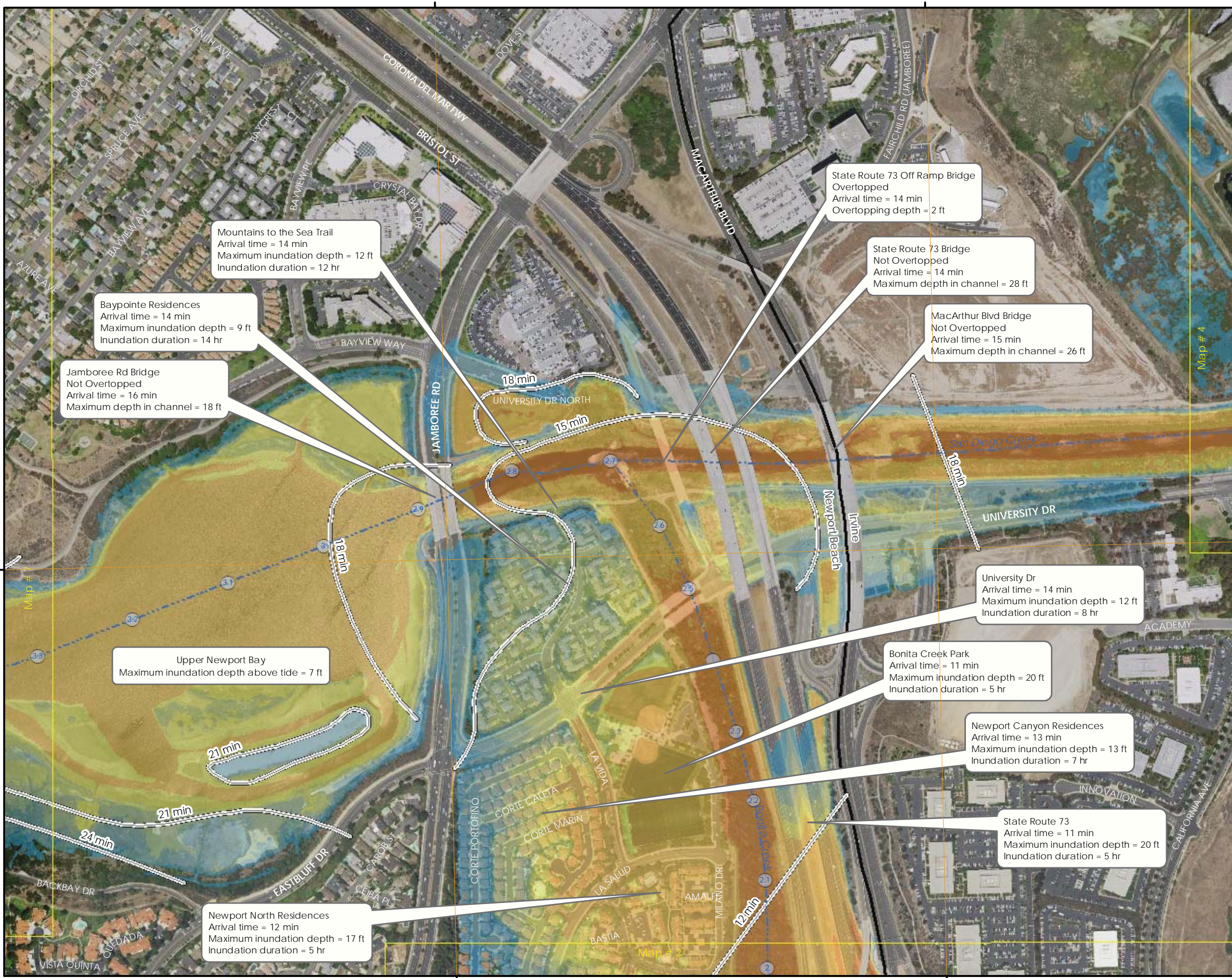
PANEL 2 of 14

STETSON ENGINEERS INC.

2/2/2018

117°52'0"W

117°51'30"W



Mountains to the Sea Trail
 Arrival time = 14 min
 Maximum inundation depth = 12 ft
 Inundation duration = 12 hr

Baypointe Residences
 Arrival time = 14 min
 Maximum inundation depth = 9 ft
 Inundation duration = 14 hr

Jamboree Rd Bridge
 Not Overtopped
 Arrival time = 16 min
 Maximum depth in channel = 18 ft

State Route 73 Off Ramp Bridge
 Overtopped
 Arrival time = 14 min
 Overtopping depth = 2 ft

State Route 73 Bridge
 Not Overtopped
 Arrival time = 14 min
 Maximum depth in channel = 28 ft

MacArthur Blvd Bridge
 Not Overtopped
 Arrival time = 15 min
 Maximum depth in channel = 26 ft

University Dr
 Arrival time = 14 min
 Maximum inundation depth = 12 ft
 Inundation duration = 8 hr

Bonita Creek Park
 Arrival time = 11 min
 Maximum inundation depth = 20 ft
 Inundation duration = 5 hr

Newport Canyon Residences
 Arrival time = 13 min
 Maximum inundation depth = 13 ft
 Inundation duration = 7 hr

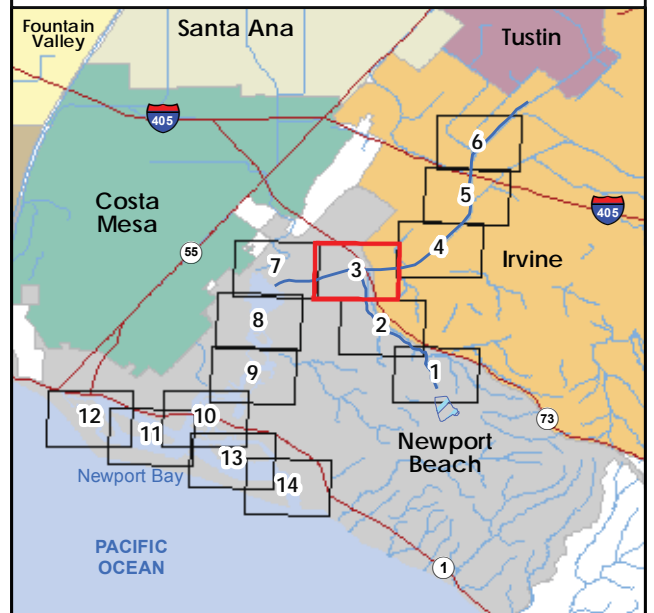
State Route 73
 Arrival time = 11 min
 Maximum inundation depth = 20 ft
 Inundation duration = 5 hr

Newport North Residences
 Arrival time = 12 min
 Maximum inundation depth = 17 ft
 Inundation duration = 5 hr

Upper Newport Bay
 Maximum inundation depth above tide = 7 ft

SAN JOAQUIN RESERVOIR DAM INUNDATION MAP FLOOD ARRIVAL TIME

STATE DAM NO. 1029.000
 NATIONAL DAM NO. CA00853
 ORANGE COUNTY, CALIFORNIA



Legend

	Mapbook Page #		0-2 ft		10-20 ft
	San Joaquin Reservoir		2-4 ft		20-30 ft
	Dam Crest		4-6 ft		30-40 ft
	Arrival Time		6-8 ft		>40 ft
	Creek		8-10 ft		
	City Boundary				
	River Mile				

Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

This map meets all applicable state and federal standards and has been prepared in consideration of all potential downstream hazards by a licensed civil engineer.

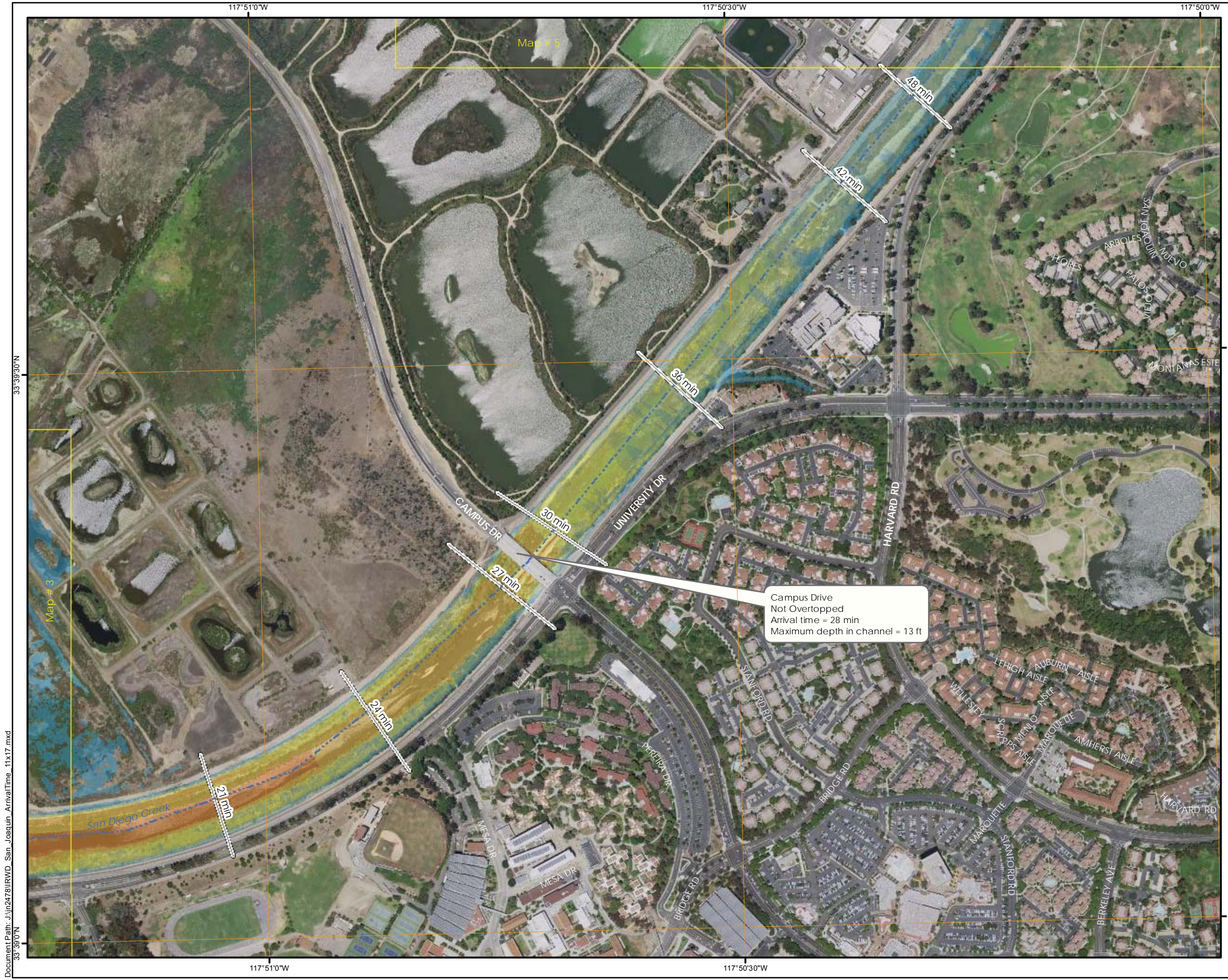
Molly Palmer

Molly Palmer,
 Civil Engineer 71788
 Expiration Date December 31, 2019

PANEL 3 of 14

2/2/2018

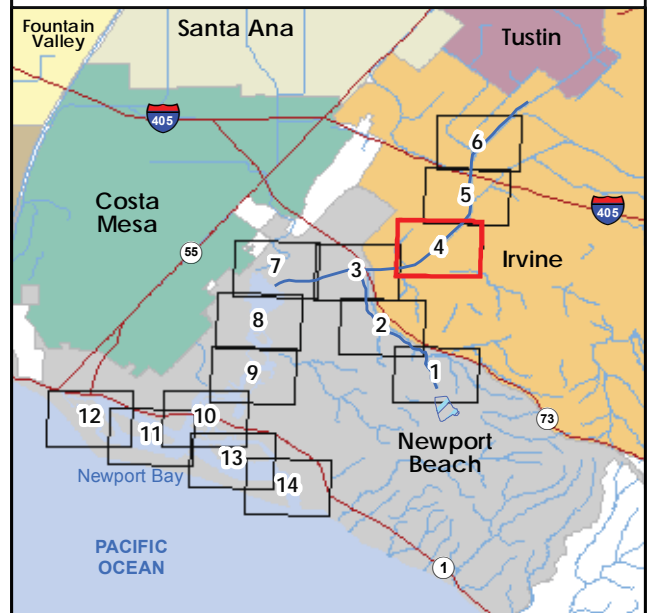
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Document Path: J:\j2478\IRWD_San_Joaquin_ArrivalTime_11x17.mxd

SAN JOAQUIN RESERVOIR DAM INUNDATION MAP FLOOD ARRIVAL TIME

STATE DAM NO. 1029.000
NATIONAL DAM NO. CA00853
ORANGE COUNTY, CALIFORNIA



Legend

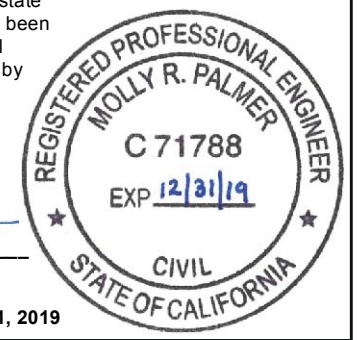
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	San Joaquin Reservoir		2-4 ft		20-30 ft
	Dam Crest		4-6 ft		30-40 ft
	Arrival Time		6-8 ft		>40 ft
	Creek		8-10 ft		
	City Boundary				
	River Mile				

Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

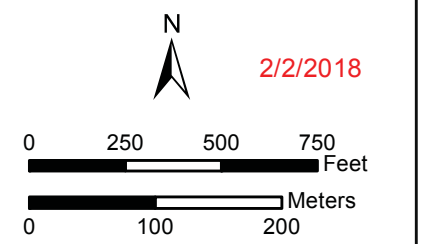
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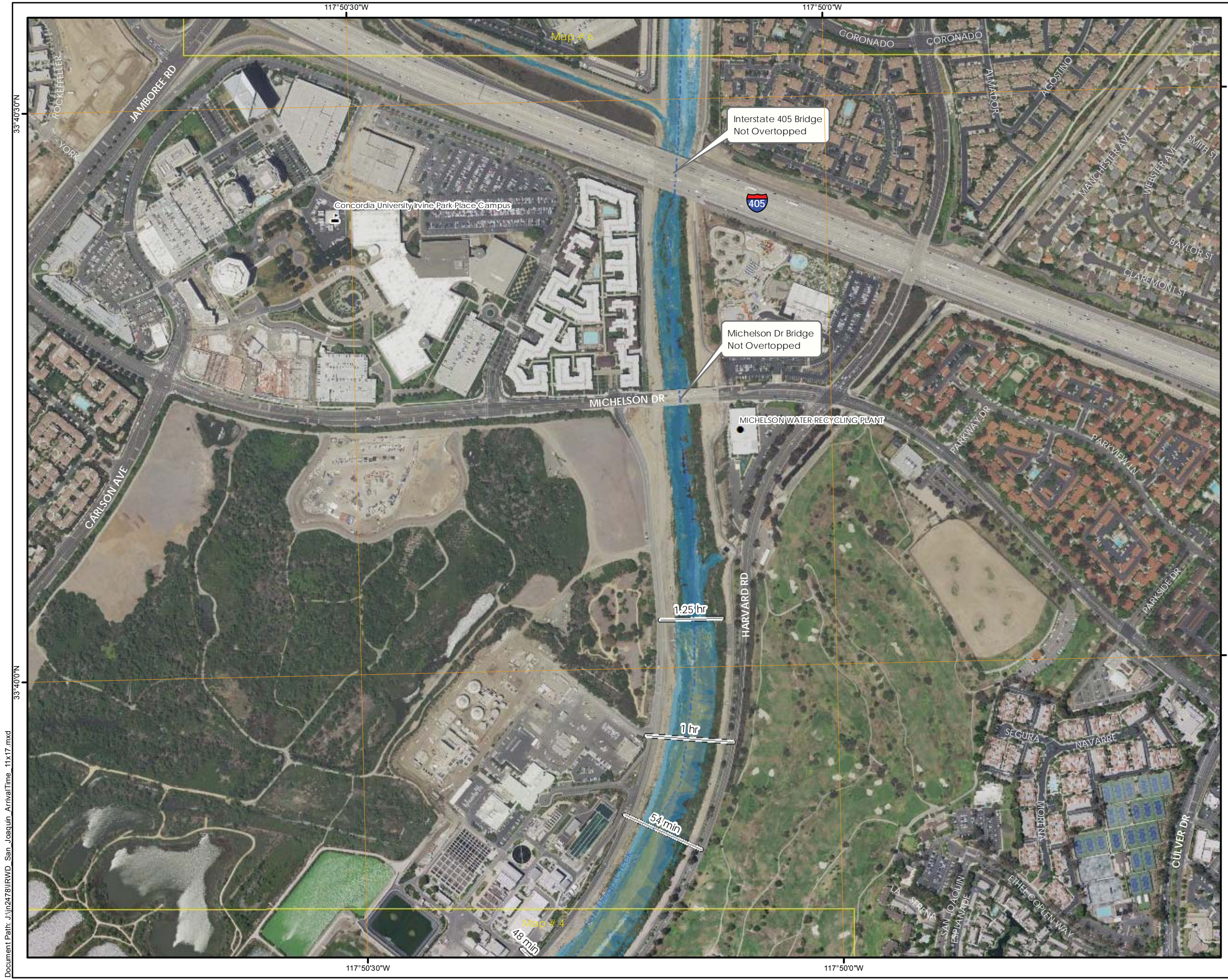
Molly Palmer

Molly Palmer,
Civil Engineer 71788
Expiration Date December 31, 2019

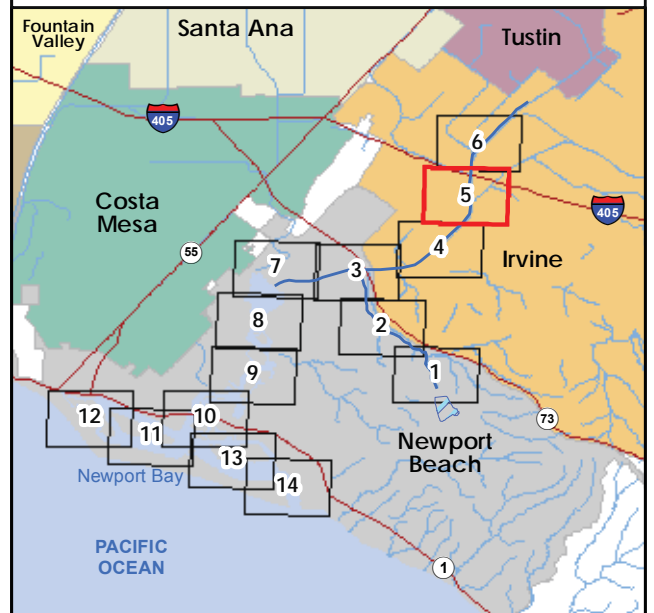


PANEL 4 of 14





**SAN JOAQUIN RESERVOIR DAM
INUNDATION MAP
FLOOD ARRIVAL TIME**
STATE DAM NO. 1029.000
NATIONAL DAM NO. CA00853
ORANGE COUNTY, CALIFORNIA



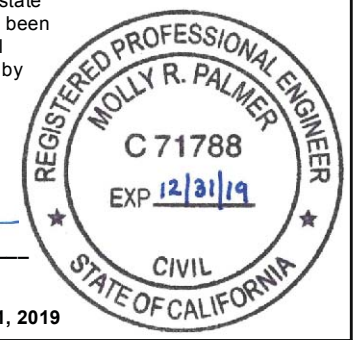
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Mapbook Page #	0-2 ft	10-20 ft
San Joaquin Reservoir	2-4 ft	20-30 ft
Dam Crest	4-6 ft	30-40 ft
Arrival Time	6-8 ft	>40 ft
Creek	8-10 ft	
City Boundary		
River Mile		
School		

Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

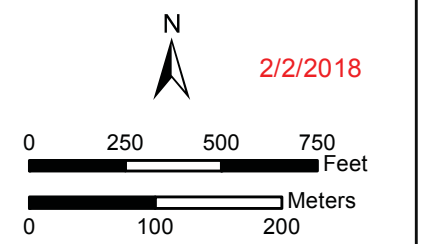
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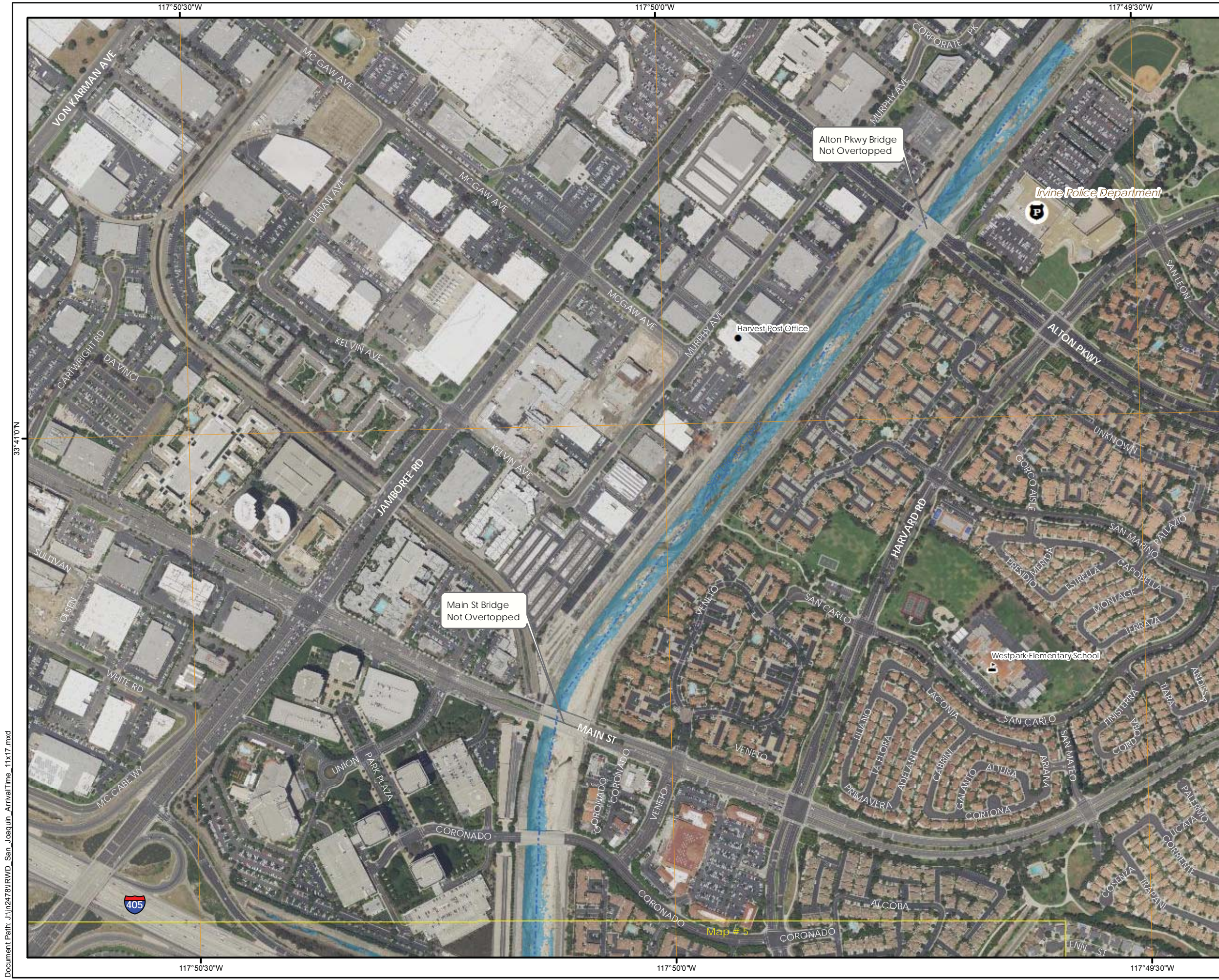
Molly Palmer



Molly Palmer,
Civil Engineer 71788
Expiration Date December 31, 2019

PANEL 5 of 14

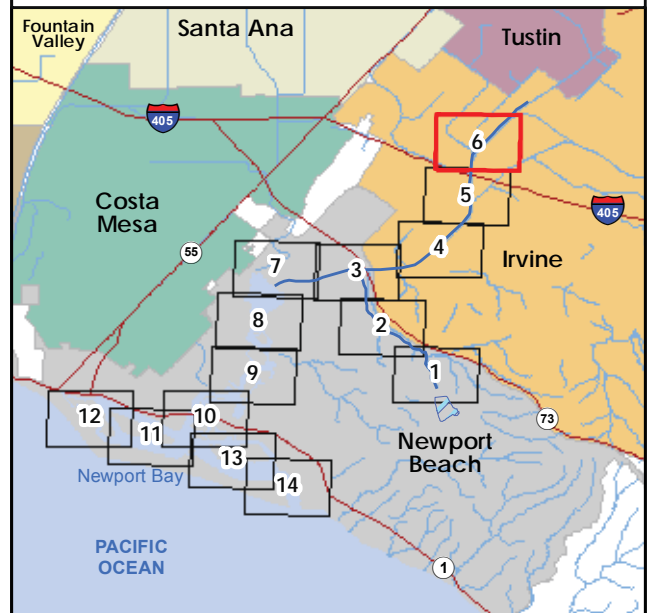




SAN JOAQUIN RESERVOIR DAM INUNDATION MAP

FLOOD ARRIVAL TIME

STATE DAM NO. 1029.000
NATIONAL DAM NO. CA00853
ORANGE COUNTY, CALIFORNIA



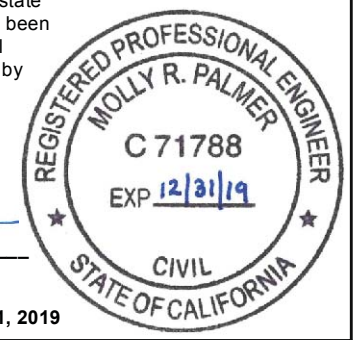
Legend

	Mapbook Page #		0-2 ft		10-20 ft
	San Joaquin Reservoir		2-4 ft		20-30 ft
	Dam Crest		4-6 ft		30-40 ft
	Arrival Time		6-8 ft		>40 ft
	Creek		8-10 ft		
	City Boundary				
	River Mile				
	School				
	Police Station				

Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

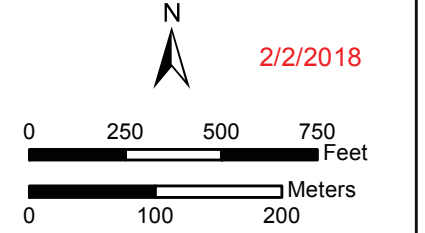
This map meets all applicable state and federal standards and has been prepared in consideration of all potential downstream hazards by a licensed civil engineer.

Molly Palmer



Molly Palmer,
Civil Engineer 71788
Expiration Date December 31, 2019

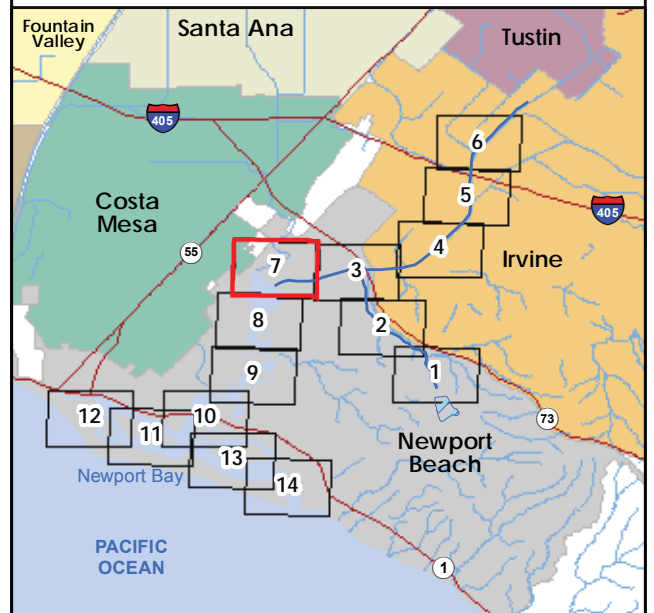
PANEL 6 of 14





SAN JOAQUIN RESERVOIR DAM INUNDATION MAP FLOOD ARRIVAL TIME

STATE DAM NO. 1029.000
NATIONAL DAM NO. CA00853
ORANGE COUNTY, CALIFORNIA



Legend

Mapbook Page #	0-2 ft	10-20 ft
San Joaquin Reservoir	2-4 ft	20-30 ft
Dam Crest	4-6 ft	30-40 ft
Arrival Time	6-8 ft	>40 ft
Creek	8-10 ft	
City Boundary		
River Mile		
School		
Fire Station		

Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

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Molly Palmer,
Civil Engineer 71788
Expiration Date December 31, 2019

PANEL 7 of 14

STETSON ENGINEERS INC.

2/2/2018

117°53'30"W

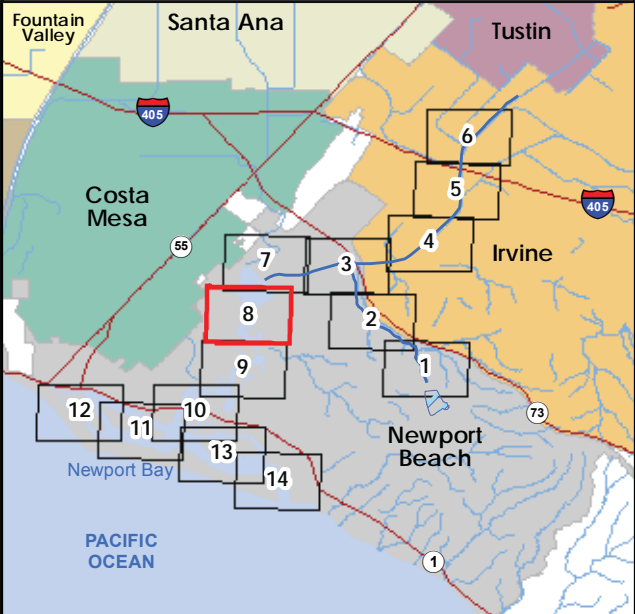
117°53'0"W



117°53'30"W

117°53'0"W

**SAN JOAQUIN RESERVOIR DAM
INUNDATION MAP
FLOOD ARRIVAL TIME**
STATE DAM NO. 1029.000
NATIONAL DAM NO. CA00853
ORANGE COUNTY, CALIFORNIA



Legend

	Mapbook Page #		0-2 ft		10-20 ft
	San Joaquin Reservoir		2-4 ft		20-30 ft
	Dam Crest		4-6 ft		30-40 ft
	Arrival Time		6-8 ft	>40 ft color swatch"/>	>40 ft
	Creek		8-10 ft		
	City Boundary				
	River Mile				
	School				

Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

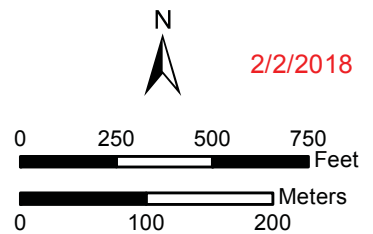
This map meets all applicable state and federal standards and has been prepared in consideration of all potential downstream hazards by a licensed civil engineer.

Molly Palmer



Molly Palmer,
Civil Engineer 71788
Expiration Date December 31, 2019

PANEL 8 of 14



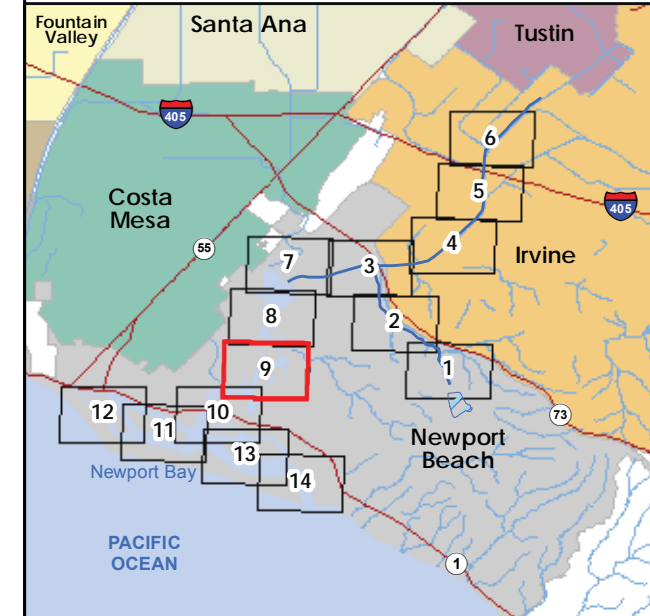
117°53'30"W

117°53'0"W



Upper Newport Bay
Maximum inundation depth above tide = 3 ft

**SAN JOAQUIN RESERVOIR DAM
INUNDATION MAP
FLOOD ARRIVAL TIME**
STATE DAM NO. 1029.000
NATIONAL DAM NO. CA00853
ORANGE COUNTY, CALIFORNIA



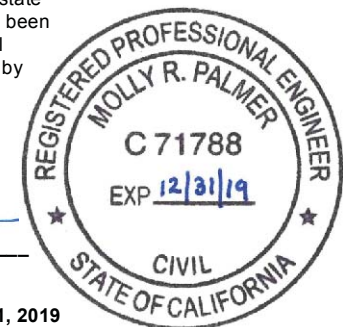
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	Mapbook Page #		0-2 ft		10-20 ft
	San Joaquin Reservoir		2-4 ft		20-30 ft
	Dam Crest		4-6 ft		30-40 ft
	Arrival Time		6-8 ft		>40 ft
	Creek		8-10 ft		
	City Boundary				
	River Mile				
	Fire Station				
	Police Station				

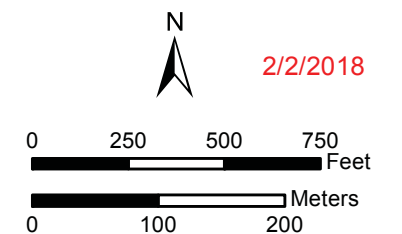
Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

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Molly Palmer,
Civil Engineer 71788
Expiration Date December 31, 2019



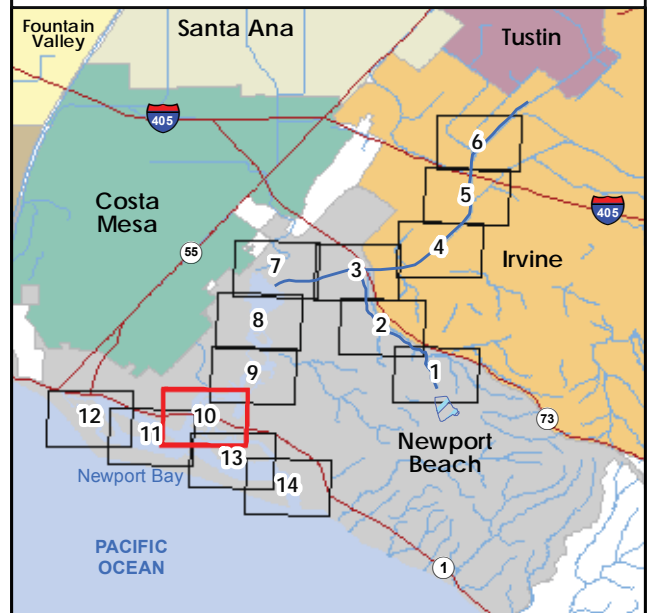
PANEL 9 of 14





SAN JOAQUIN RESERVOIR DAM INUNDATION MAP FLOOD ARRIVAL TIME

STATE DAM NO. 1029.000
NATIONAL DAM NO. CA00853
ORANGE COUNTY, CALIFORNIA



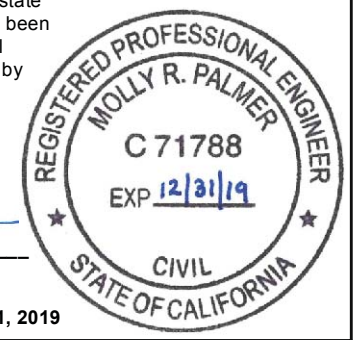
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	Mapbook Page #		0-2 ft		10-20 ft
	San Joaquin Reservoir		2-4 ft		20-30 ft
	Dam Crest		4-6 ft		30-40 ft
	Arrival Time		6-8 ft	>40 ft depth symbol"/>	>40 ft
	Creek		8-10 ft		
	City Boundary				
	River Mile				

Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

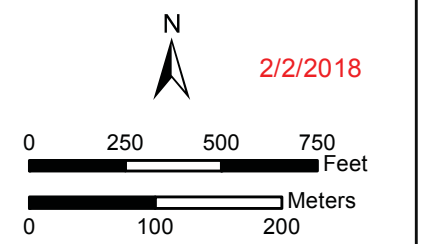
This map meets all applicable state and federal standards and has been prepared in consideration of all potential downstream hazards by a licensed civil engineer.

Molly Palmer



Molly Palmer,
Civil Engineer 71788
Expiration Date December 31, 2019

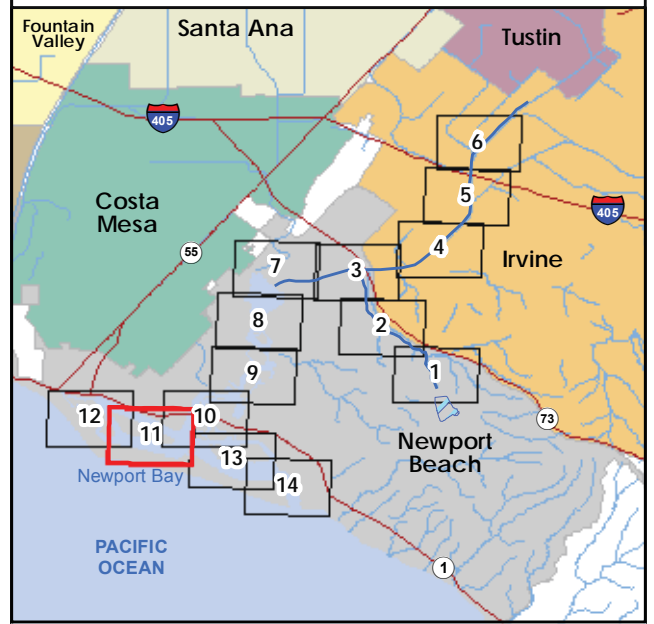
PANEL 10 of 14





SAN JOAQUIN RESERVOIR DAM INUNDATION MAP FLOOD ARRIVAL TIME

STATE DAM NO. 1029.000
NATIONAL DAM NO. CA00853
ORANGE COUNTY, CALIFORNIA



Legend

Mapbook Page #	0-2 ft	10-20 ft
San Joaquin Reservoir	2-4 ft	20-30 ft
Dam Crest	4-6 ft	30-40 ft
Arrival Time	6-8 ft	>40 ft
Creek	8-10 ft	
City Boundary		
River Mile		
School		
Fire Station		

Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

This map meets all applicable state and federal standards and has been prepared in consideration of all potential downstream hazards by a licensed civil engineer.

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Civil Engineer 71788
Expiration Date December 31, 2019

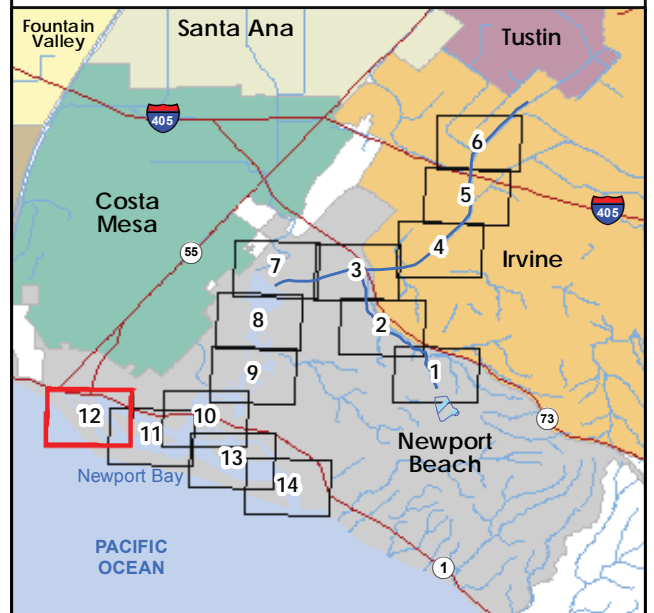
PANEL 11 of 14

STETSON ENGINEERS INC.

2/2/2018



**SAN JOAQUIN RESERVOIR DAM
INUNDATION MAP
FLOOD ARRIVAL TIME**
STATE DAM NO. 1029.000
NATIONAL DAM NO. CA00853
ORANGE COUNTY, CALIFORNIA



Legend

	Mapbook Page #		0-2 ft		10-20 ft
	San Joaquin Reservoir		2-4 ft		20-30 ft
	Dam Crest		4-6 ft		30-40 ft
	Arrival Time		6-8 ft	>40 ft color swatch"/>	>40 ft
	Creek		8-10 ft		
	City Boundary				
	River Mile				
	Fire Station				

Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

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Molly Palmer,
 Civil Engineer 71788
 Expiration Date December 31, 2019

PANEL 12 of 14

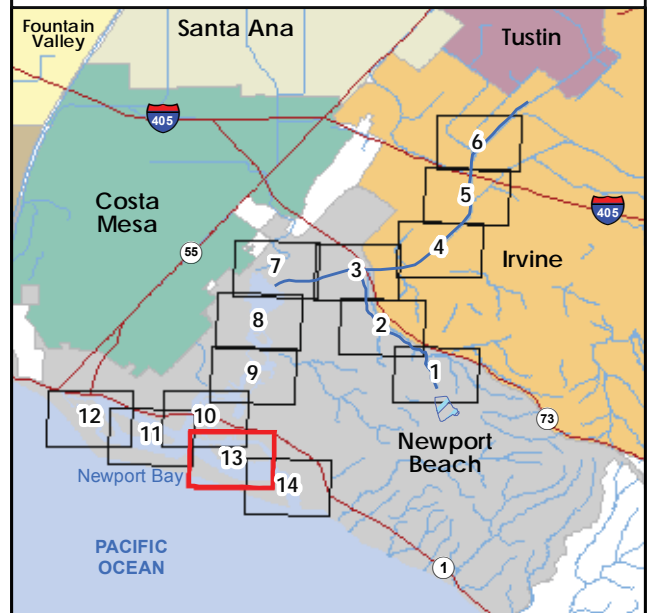
STETSON ENGINEERS INC.

2/2/2018



SAN JOAQUIN RESERVOIR DAM INUNDATION MAP FLOOD ARRIVAL TIME

STATE DAM NO. 1029.000
NATIONAL DAM NO. CA00853
ORANGE COUNTY, CALIFORNIA



Legend

Mapbook Page #	0-2 ft	10-20 ft
San Joaquin Reservoir	2-4 ft	20-30 ft
Dam Crest	4-6 ft	30-40 ft
Arrival Time	6-8 ft	>40 ft
Creek	8-10 ft	
City Boundary		
River Mile		
Fire Station		

Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

This map meets all applicable state and federal standards and has been prepared in consideration of all potential downstream hazards by a licensed civil engineer.

Molly Palmer,
Civil Engineer 71788
Expiration Date December 31, 2019

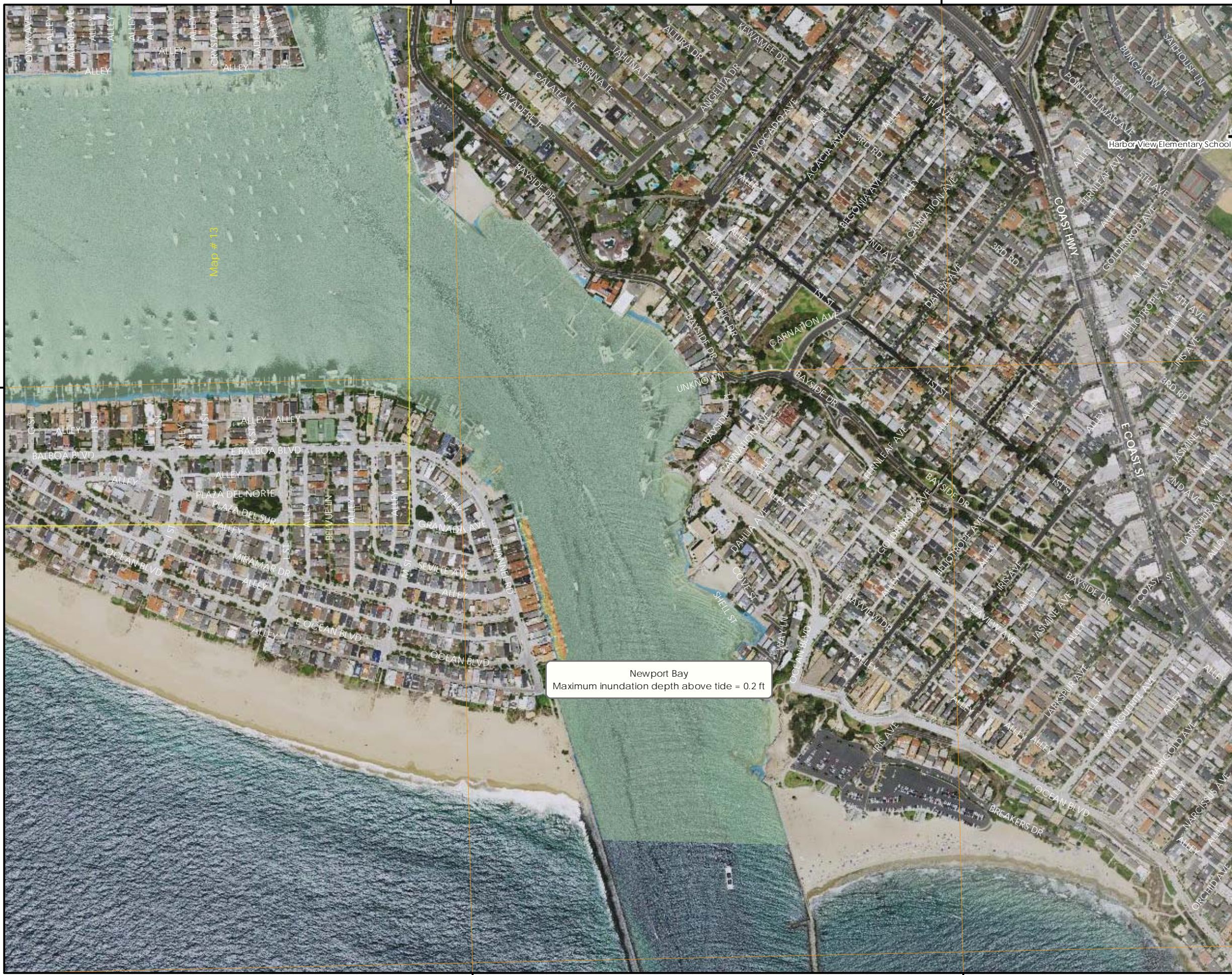
PANEL 13 of 14

STETSON ENGINEERS INC.

2/2/2018

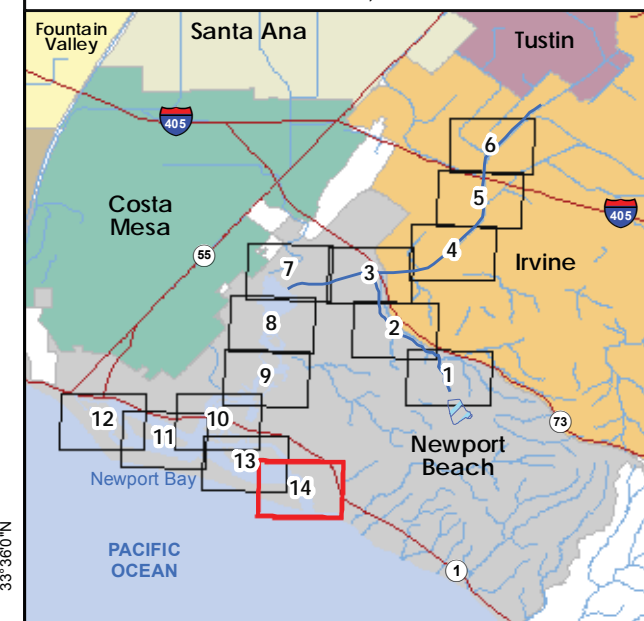
117°53'0"W

117°52'30"W



Newport Bay
Maximum inundation depth above tide = 0.2 ft

**SAN JOAQUIN RESERVOIR DAM
INUNDATION MAP
FLOOD ARRIVAL TIME**
STATE DAM NO. 1029.000
NATIONAL DAM NO. CA00853
ORANGE COUNTY, CALIFORNIA



Legend

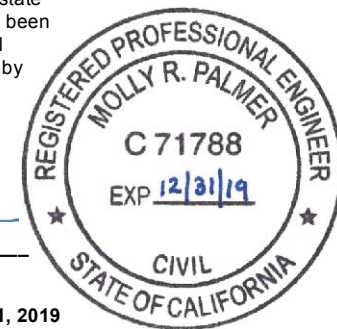
	Mapbook Page #		0-2 ft		10-20 ft
	San Joaquin Reservoir		2-4 ft		20-30 ft
	Dam Crest		4-6 ft		30-40 ft
	Arrival Time		6-8 ft		>40 ft
	Creek		8-10 ft		
	City Boundary				
	River Mile				
	School				

Note: Grid lines show latitude and longitude at 30 arc-second spacing in the WGS84 horizontal datum. Information shown on this map is approximate and should be used as a guideline for emergency response and preparation purposes.

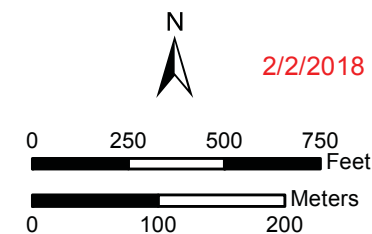
This map meets all applicable state and federal standards and has been prepared in consideration of all potential downstream hazards by a licensed civil engineer.

Molly Palmer

Molly Palmer,
Civil Engineer 71788
Expiration Date December 31, 2019



PANEL 14 of 14



117°53'0"W

117°52'30"W

33°36'0"N

33°36'0"N

33°35'30"N

Document Path: J:\m2478\IRWD_San_Joaquin_ArrivalTime_11x17.mxd

PART III: Appendices

Appendix A: EAP Status Report (for Non-FERC dams)

EAP Status Report for San Joaquin Reservoir Dam, DSOD No. 1029.000

Annual EAP Review Performed:

Annual Update Sent to Plan Holders:

Annual Notification Exercise:

Prepared by:

Mail this document, or something similar, to the Cal OES Emergency Action Planning Division:
Dam Safety Planning Chief
Dam Emergency Action Planning Division
3650 Schriever Avenue
Mather, CA 95655

OR to send it electronically to the Division at eap@caloes.ca.gov.

Appendix B: Record of EAP Revisions

Revision #	Date	Sections Reviewed or Revisions Made	By Whom
1	February 26, 2020	Local Agency Review Draft	IRWD
2	April 17, 2020	Draft Submittal to CalOES	IRWD
3	October 21, 2020	Draft EAP updated per comments in CalOES Review Report No. 1; notification charts updated per CalOES comments. Vicinity map and schematic map added. Appendix C info updated.	IRWD
4	February 5, 2021	Document edited in response to CalOES Review Report #2 dated November 17, 2020; notification charts updated; updated Warning Center incident report (Appendix I)	IRWD
5	May 21, 2021	Added Transportation Corridor Agencies (Toll Roads) contact info to notification charts, table in section 3.2, and Appendix C. Updated IRWD Communications contact info.	IRWD
6	May 6, 2022	Annual EAP Update with updated contact information; Sections revised include: Dam contact information; document date; Sections 3.1 (notification charts), 3.2, 6.5, 7.8, 8.2. Appendices B and C.	IRWD
7	May 18, 2023	Annual EAP Update with updated contact information; Sections revised include: Dam contact information; document date; Sections 1.3, 2.1, 2.2.13, 3.1 (notification charts), 3.2, 4, 5.1, 5.4, 6.1, 6.2, 7.1. Appendices B and C	IRWD

Revision #	Date	Sections Reviewed or Revisions Made	By Whom
8	April 24, 2024	Annual EAP Update with updated contact information; Revisions include: added description of County Alert Warning Plan; referenced IRWD’s public communications plan; updated language for CA State Warning Center responsibilities; added Appendix K “Anatomy of a Dam” figure to explain dam terminology; updated plan holders	IRWD (Stetson)
9	May 16, 2025	Annual EAP Update with updated contact information; Revisions include: updated links to public agency emergency operations plans, updated phone notification scripts to shorten and improve clarity; reformatted notification flowcharts to improve clarity; revised IRWD responsibilities according to current staffing; added written notification scripts to Appendix E; updated plan holders	IRWD (Stetson)
10	March 30, 2026	Annual EAP Update with updated contact information and updated plan holders	IRWD (Stetson)

Appendix C: Record of Plan Holders

Copy Number	Organization	Person Receiving Copy
1	Irvine Ranch Water District	Jose Zepeda, Director of Water and Recycling Operations
2	Irvine Ranch Water District	David Paulson, Operations Supervisor
3	Irvine Ranch Water District	Jacob Moeder, P.E., Dam Safety Engineer
4	Irvine Ranch Water District	Bryan Clinton, Operations Manager
5	Irvine Ranch Water District	Steve Choi, Director of Safety and Security; EAP Coordinator
6	Irvine Ranch Water District	John Fabris, IRWD Communications
7	Orange County Sheriff's Department, Emergency Management Division	Michelle Anderson, Emergency Management Director Mayra Wheeler, Senior Emergency Management Program Coordinator Kevin McArthur, Assistant Emergency Manager
8	Orange County Public Works	Alison Camara, Senior Civil Engineer Trevor Richardson, Emergency Manager
9	Orange County Fire Authority	Nick Freeman, Division 2 Chief
10	Newport Beach Fire Department	Jeff Boyles, Fire Chief
11	Newport Beach Police Department	Katie Eing, Emergency Services Coordinator
12	Newport Beach Utilities Department	Casey Parks, Utilities Superintendent
13	Irvine Police Department	Robert Simmons, Manager, Emergency Services
14	Cal OES	Dam Safety Planning Division
15	DSOD	Brandon Cruz, Southern Regional Engineer Cameron Lancaster, Area 9 Engineer
16	DWR Flood Operations Center	State-Federal Flood Operations Center

Phone numbers and email addresses have been removed from this publicly posted copy of this Emergency Action Plan. That information is available from Irvine Ranch Water District's district secretary: Phone 949-453-5300, Email Comments@IRWD.com

17	National Weather Service	Sam Zuber, Hydrology Program Manager Weather Forecasting Office
18	California Highway Patrol, Santa Ana Office	Sgt. Anselmo Templado Capt. Mike Salinas Lt. Kris Ulibarri Lt. Stephanie Hamilton
19	Caltrans District 12 Office	Ben Nanjappa, D-12 Maintenance Engineer John Bybee, EOC Coordinator
20	Transportation Corridor Agencies (Toll Roads)	Michele Miller, Chief External Affairs Officer
21	WEROC	Vicki Osborn, Director of Emergency Management

Phone numbers and email addresses have been removed from this publicly posted copy of this Emergency Action Plan. That information is available from Irvine Ranch Water District's district secretary: Phone 949-453-5300, Email Comments@IRWD.com

Appendix D: Contact Log

After determining the emergency level, use the contact log to document notifications made in accordance with Section 3 of the EAP.

CONTACT LOG

Dam Name: SAN JOAQUIN RESERVOIR DAM		Date:	
NID #: CA00853	DSOD Dam #:1029.000	FERC #: N/A	
DSOD Region: SOUTH		County: ORANGE	
Emergency Level:		Incident/Exercise:	
After determining the emergency level, immediately contact the following agencies/entities. The person making the contact should initial and record the time of the call and who was contacted at each agency/entity.			
Agency/Entity	Person Contacted	Contact Time	Contacted By

Appendix E: Pre-Scripted Messages

The following pre-scripted messages are for use during notifications at any Emergency Level applicable to San Joaquin Reservoir Dam.

High Flow Emergency Level Phone Notification Script

This is _____ [your name and position].

IRWD has activated the Emergency Action Plan for San Joaquin Reservoir Dam, No. 1029.000, located in Newport Beach. The dam is under a **High Flow** condition but is not in danger of failing.

High flows at the dam began at _____ on _____.
(time) (date)

The current flow at the dam is ____ cfs.

You have/will receive a text or email with additional details. We'll provide updates when there are any changes in flow or dam condition. What is the best way to contact you with additional updates? [record contact information].

I can be contacted at _____. [preferred contact method]

If you can't reach me, please use _____. [alternate contact method]

High Flow Emergency Level Written Notification Script

IRWD has identified an emergency condition at San Joaquin Reservoir Dam, No. 1029.000, located in Newport Beach.

IRWD has activated the Emergency Action Plan for this dam and are determining this to be a **High Flow** condition. The San Joaquin Dam is *not* in danger of failing.

At _____ on _____, IRWD observed unusually high flows at the dam.
(time) (date)

The high flows are the result of _____.

Current flow into the reservoir is ____ cfs.

Current flow out of the reservoir is ____ cfs.

Current water surface elevation in the reservoir is ____ ft.

The dam is not predicted to fail because of this condition. IRWD will provide updates detailing any changes in flow or dam condition and will notify you when the high flow situation is resolved.

Please take the following actions: _____

_____.

An IRWD representative can be contacted at: _____.

Non-Failure Emergency Level Phone Notification Script

This is _____ [your name and position].

IRWD has activated the Emergency Action Plan for San Joaquin Reservoir Dam, No. 1029.000, located in Newport Beach. The dam is under a **Non-Failure** condition and is not in danger of failing.

IRWD activated the EAP because _____.
(description of condition)

You have/will receive a written notification with additional details. We'll provide updates detailing any changes in flow or dam condition. What is the best way to contact you with additional updates? [record contact information].

I can be contacted at _____. [preferred contact method]

If you can't reach me, please use _____. [alternate contact method]

Non-Failure Emergency Level Written Notification Script

IRWD has identified an emergency condition at San Joaquin Reservoir Dam, No. 1029.000, located in Newport Beach.

IRWD has activated the Emergency Action Plan for this dam and are determining this to be a **Non-Failure** condition. The San Joaquin Dam is *not* in danger of failing.

At _____ on _____, IRWD observed _____.
(time) (date)

The current flow into the reservoir is ___ cfs.
The current flow out of the reservoir is ___ cfs.

The dam is not predicted to fail because of this condition. IRWD will provide updates detailing any changes in flow or dam condition and will notify you when the situation is resolved.

Please take the following actions: _____

_____.

An IRWD representative can be contacted at: _____.

Potential Failure Emergency Level Phone Notification Script

This is _____ [your name and position].

IRWD has activated the Emergency Action Plan for San Joaquin Reservoir Dam, No. 1029.000, located in Newport Beach. The dam is under a **Potential Failure** condition and may be in danger of failing.

IRWD is responding to _____ [describe event] that could result in dam failure as early as _____.

Please reference the inundation map in your copy of the Emergency Action Plan and prepare to evacuate the low-lying portions of Newport Beach and Irvine west of Macarthur Boulevard.

The Newport Beach Police Department is the PSAP for this emergency.

You have/will receive a written notification with additional details. We'll provide updates detailing any changes in flow or dam condition. What is the best way to contact you with additional updates? [record contact information].

I can be contacted at _____. [preferred contact method]

If you can't reach me, please use _____. [alternate contact method]

Potential Failure Emergency Level Written Notification Script

IRWD has activated the Emergency Action Plan for San Joaquin Reservoir Dam, No. 1029.000, located in Newport Beach. The dam is under a **Potential Failure** condition and may be in danger of failing.

At _____ on _____, IRWD observed _____.
(time) (date)

The current flow into the reservoir is ___ cfs.

The current flow out of the reservoir is ___ cfs.

IRWD is implementing predetermined actions to respond to this rapidly developing situation that could result in dam failure.

The dam could potentially fail as early as _____.

Please prepare to evacuate the low-lying portions of the Newport North, Newport Canyon, and Baypoint Residences, as well as Bonita Creek Park and the Bonita Creek Bike Path. In the event of a failure, portions of Bonita Canyon Drive, Jamboree Road, University Drive, and State Route 73 are expected to be inundated.

Reference the inundation map in your copy of the Emergency Action Plan for detailed inundation areas.

The Newport Beach Police Department is the Primary Safety Answering Point for this emergency and will be coordinating the emergency response.

IRWD will advise you when the situation is resolved or if the situation gets worse.

An IRWD representative can be contacted at the following number: _____.

Imminent Failure Emergency Level Phone Notification Script

This is an emergency. This is _____ [your name and position].

San Joaquin Reservoir Dam, No. 1029.000, located in Newport Beach, is failing.

The downstream area must be evacuated immediately.

Repeat, San Joaquin Reservoir Dam is failing; evacuate the low-lying portions of the Newport North, Newport Canyon, and Baypoint Residences, as well as Bonita Creek Park and the Bonita Creek Bike Path. Bonita Canyon Drive, Jamboree Road, University Drive, and State Route 73 near Bison Avenue are expected to be inundated and should be closed. Do not approach channels where high flow is expected.

Reference the inundation map in your copy of the Emergency Action Plan for specific evacuation areas.

The Newport Beach Police Department is the PSAP for this emergency.

You have/will receive a written notification with additional details for this **Imminent Failure** condition.

I can be contacted at _____. [preferred contact method]

If you can't reach me, please use _____. [alternate contact method]

The next status report will be provided in approximately 30 minutes. What is the best way to contact you with additional updates? [record contact information].

Imminent Failure Emergency Level Written Notification Script

THIS IS AN EMERGENCY.

San Joaquin Reservoir Dam, No. 1029.000, located in Newport Beach, is failing.

The downstream area must be evacuated immediately.

Evacuate the low-lying portions of the Newport North, Newport Canyon, and Baypoint Residences, as well as Bonita Creek Park and the Bonita Creek Bike Path. Bonita Canyon Drive, Jamboree Road, University Drive, and State Route 73 near Bison Avenue are expected to be inundated and should be closed.

IRWD has activated the Emergency Action Plan for San Joaquin Reservoir Dam. The dam is under an **Imminent Failure** condition. The San Joaquin Dam is failing.

At _____ on _____, IRWD observed _____.
(time) (date)

The current flow into the reservoir is ___ cfs.
The current flow out of the reservoir is ___ cfs.

Reference the inundation map in your copy of the Emergency Action Plan.

The Newport Beach Police Department is the Primary Safety Answering Point for this emergency and will be coordinating the emergency response.

IRWD will advise you when the situation is resolved or if the situation gets worse.

An IRWD representative can be contacted at the following number: _____.

The next status report will be provided in approximately 30 minutes.

Imminent Failure Emergency Level Public Message

The following pre-scripted message may be **used for emergency management authorities to communicate the Imminent Failure of the dam with the public:**

Attention: This is an emergency message from _____ [emergency management agency]. Listen carefully. Your life may depend on immediate action.

San Joaquin Reservoir Dam, located in Newport Beach, is failing. Repeat. San Joaquin Reservoir, Dam No. 1029.000, located in Newport Beach, is failing.

If you are in or near this area, proceed immediately to high ground. The low-lying portions of the Newport North, Newport Canyon, and Baypoint Residences, as well as Bonita Creek Park and the Bonita Creek Bike Path may be inundated. Bonita Canyon Drive, Jamboree Road, University Drive, and State Route 73 near Bison Avenue are expected to be inundated and access may be limited. High flows are expected in Bonita Creek, San Diego Creek, and Upper Newport Bay. Do not approach channels where high flow is expected.

If you are in or near this area, proceed immediately to high ground away from low lying areas.

Repeat message.

Appendix G: Emergency Termination Log

Dam Name:	County:
Dam Location:	Stream/River:
Date/Time:	
Weather Conditions:	
General Description of Emergency Situation:	
Area(s) of Dam Affected:	
Extent of Damage to Dam and Possible Causes:	
Effect on Dam Operation:	
Initial Reservoir Elevation/Time: Maximum Reservoir Elevation/Time: Final Reservoir Elevation/Time:	
Description of Area Flooded Downstream/Damage/Loss of Life:	
Justification for Termination of Dam Safety Emergency:	
Other Data and Comments:	
Report Prepared By (Printed Name and Signature): Date:	

Appendix H: After Action Report

Background

Event Details

Type of Event:

Location:

Incident Period:

Brief Description of Event:

Response Activities

Summary of Successes

Summary of Recommended Improvements

Organizations Contributing to this Report

Appendix I: Cal OES Warning Center Dam Incident Report

DAM INCIDENT – CALIFORNIA STATE WARNING CENTER

EVENT TYPE:	<input type="radio"/> DRILL <input type="radio"/> ACTUAL EVENT	
DATE:		TIME:
CALLER INFORMATION		
NAME/AGENCY:	PHONE #:	
ALTERNATE CONTACT:	PHONE #:	
DAM INFORMATION		
DAM NAME: San Joaquin Reservoir	DSOD DAM #: 1029.000	FERC: none
DSOD HAZARD CLASSIFICATION: EXTREMELY HIGH		
LOCATION OF DAM		
DSOD REGION:	<input type="radio"/> NORTHERN <input type="radio"/> CENTRAL <input checked="" type="radio"/> SOUTHERN	
PHYSICAL ADDRESS: 2350 Ford Road Newport Beach, CA 92660		
LATITUDE: 33.6201	LONGITUDE: 117.8433	
COUNTY: ORANGE	DOWNSTREAM JURISDICTIONS: Irvine, Newport Beach	
NEAREST CITY OR POPULATED AREA: Newport Beach		
NEAREST OR AFFECTED HIGHWAY OR CROSS ROADS: Bonita Canyon Drive near route 73		
RIVER OR CREEK THAT FLOWS INTO RESERVOIR: None (offstream)		
SITUATION		
ACTIVATION OF EAP:	<input type="radio"/> Yes <input type="radio"/> No	
EMERGENCY LEVEL:	<input type="radio"/> High Flow <input type="radio"/> Non-Failure <input type="radio"/> Potential Failure <input type="radio"/> Imminent Failure	
EMERGENCY TYPE:		
<input type="checkbox"/> Earthquake <input type="checkbox"/> Sand Boils <input type="checkbox"/> Embankment Cracking or Settlement <input type="checkbox"/> Security Threats <input type="checkbox"/> Embankment Movement <input type="checkbox"/> Seepage, Springs, Piping <input type="checkbox"/> Erosion of Spillway <input type="checkbox"/> Sinkholes <input type="checkbox"/> Instrumentation Reading (Abnormal) <input type="checkbox"/> Storm Event <input type="checkbox"/> Outlet System Failure <input type="checkbox"/> Other: List Below <input type="checkbox"/> Sabotage/Vandalism		
OTHER:		
RESERVOIR LEVEL:	<input type="checkbox"/> Full <input type="checkbox"/> Partially Full <input type="checkbox"/> Empty	
	Approximate % Full (Acre-Feet):	
WHEN/HOW EVENT WAS DETECTED:		
OBSERVER IN POSITION:	<input type="radio"/> Yes <input type="radio"/> No	
ADDITIONAL DETAILS:		

Appendix J: Acronym List

CAS	Critical Appurtenant Structure
Cal OES	California Governor’s Office of Emergency Services
Caltrans	California Department of Transportation
cfs	cubic feet per second
CHP	California Highway Patrol
DSOD	Division of Safety of Dams
DWR	Department of Water Resources
EAP	Emergency Action Plan
EMD	Orange County Sheriff’s Department, Emergency Management Division
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
HSEEP	Homeland Security Exercise and Evaluation Program
I-405	Interstate 405
IC	Incident Commander
ICP	Incident Command Post
IRWD	Irvine Ranch Water District
MWRP	Michelson Water Recycling Plant
NAVD88	North American Vertical Datum of 1988
NGVD29	National Geodetic Vertical Datum of 1929
NID	National Inventory of Dams
NIMS	National Incident Management System
NWS	National Weather Service
OA	Operational Area
OAC	Operational Area Coordinator
OCFA	Orange County Fire Authority

OCPW Orange County Public Works
OCSD Orange County Sheriff’s Department
PIM Public Information Manager
PSAP Public Safety Answering Point
SCADA Supervisory Control and Data Acquisition
SEMS Standardized Emergency Management System
WEROC Water Emergency Response Organization of Orange County
WFO Weather Forecast Office

Appendix K: Anatomy of a Dam Figure

