



JOINT EMERGENCY ACTION PLAN FOR SEVERE STORM AND FLOOD RESPONSE IN CITY OF SAN JOSÉ

VOLUME 2 – APPENDICES

Last Revised: **November 2025**
SANTA CLARA VALLEY WATER DISTRICT

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VOLUME 2 – APPENDICES

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STRUCTURE OF THIS EMERGENCY ACTION PLAN

The plan is organized in three sections split between two volumes:

BASE PLAN

The Base Plan identifies the roles, responsibilities and actions assigned to the Multi-Agency Coordination (MAC) Group and is included in Volume 1.

ATTACHMENTS

Attachments are in Volume 1 and include information and checklists useful in any Severe Storm or Flood Incident.

APPENDICES

Provides specific details on each waterway. Volume 2 of the EAP contains Appendices A through G.

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ACRONYMS

Readers of this plan may find it useful to understand some of the Acronyms that may be used in the document.

Acronym	What is it
AAR	After Action Report
AC	Agency Coordinator
ALERT	Automated Local Evaluation in Real Time
AP	Action Plan
AR	Agency Representative
CalOES	California Office of Emergency Services
CFS	Cubic Feet per Second
City	City of San José
CRS	Community Rating System
DCC	Departmental Command Center
DOC	Department Operations Center
DWR	California Department of Water Resources
EAP	Joint Emergency Action Plan Emergency Action Plan for Severe Storm and Flood Response in City of San José Volumes 1 & 2
EC Plan	Emergency Communications Plan
EMO	Emergency Management Organization
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPIWCC	Emergency Public Information Warning Core Capability
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIT	Field Information Team
IAP	Incident Action Plan
IC	Incident Command(er)
ICS	Incident Command System
IMT	Incident Management Team
IPAWS	Integrated Public Alert Warning System
JIC	Joint Information Center
JIS	Joint Information System
LFO	Lookout field observation
LHMP	Local Hazard Mitigation Plan
LRAD	Long Range Acoustical Device
MAA	Mutual Aid Agreement
MAC	Multi-Agency Coordination
MEOC	Mobile Emergency Operations Center
NFIP	National Flood Insurance Program
NWS	National Weather Service

Acronym	What is it
OEM	Office of Emergency Management
OES	Office of Emergency Services
PIO	Public Information Officer
SME	Subject Matter Expert
UC	Unified Command(ers)
Valley Water	Santa Clara Valley Water District
VTA	Valley Transportation Authority

GLOSSARY OF TERMS

Readers of this plan may find it useful to understand some terms that may be used in the Joint Emergency Action Plan or may be used before or during an event or training exercise.

TERM	DEFINITION
After Action Report (AAR)	An After Action Report (AAR) is the final product of an exercise or actual event. The AAR has three components: <ol style="list-style-type: none"> 1. Summary of exercise objectives and actual events; 2. Observations and recommendations based on the exercise objectives or actual event as associated with the capabilities and tasks; and 3. A section that identifies specific corrective/improvement recommendations.
Boil/Seepage	When the floodwaters are higher than the land, the groundwater, under pressure from the river, exerts an upward pressure on the land inside the levee or floodwall. With time this increased “head pressure,” as it is known to engineers, can drive water through or under a levee/floodwall to the surface as seepage. When flood waters remain high for a long time though, seepage can increase in volume and velocity and begin the destructive process of moving sand/soil from the foundation, through the ground, to the surface, forming boils.
Channel Capacity	The maximum flow which can pass through a channel without overflowing the banks.
Channel Improvements or Channelization	The improvement of the water carrying capacity or flow characteristics of a natural or artificial channel by clearing, excavation, bank stabilization or other means. Also referred to as channel alterations.
Collaboration Software	Collaboration software enables the sharing, processing and management of files, documents and other data types among several users and/or systems. This type of software allows two or more remote users to jointly work on a task or project and/or to view the same data.
Community Rating System (CRS)	A program developed by FEMA to provide incentives for those communities in the Regular Program that have gone beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.
Critical Facility	For some activities and facilities, even a slight chance of flooding is too great a threat. Typical critical facilities include hospitals, fire stations, police stations, storage of critical records, and similar facilities. These facilities should be given special consideration when formulating regulatory alternatives and floodplain management plans. A critical facility should not be located in a floodplain if at all possible.
Cubic Feet per Second (CFS)	The rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and equivalent to 7.48 gallons per second or 448.8 gallons per minute.
Design Flood	The term “design flood” is used to denote the maximum flood flow used for design and operation of flood control structures and other protective measures. The Design is often set as the 100 year or 1% flow rate, but it may be set at other levels.

TERM	DEFINITION
Design Stage	The term “design stage” is used to denote the maximum level (generally denoted in feet) above the channel bottom or above sea level at the specific location for which flood control structures and other protective measures are designed. The design stage is based on a design that is often set as the 100 year or 1% flow rate, but it may be set at other levels.
Design Storm	Design storm means a hypothetical discrete rainstorm characterized by a specific duration, temporal distribution, rainfall intensity, return frequency, and total depth of rainfall.
Discharge	The amount of water that passes a point in a given period of time. Rate of discharge is usually measured in cubic feet per second (cfs).
Emergency Communications Plan	An emergency communications plan (EC plan) is a document that provides guidelines, contact information and procedures for how information should be shared during all phases of an unexpected occurrence that requires immediate action.
Emergency Management Organization (EMO)	An Emergency Management Organization (EMO) coordinates activities related to an event. Examples of EMOs are: <ul style="list-style-type: none"> • Agency leadership and other staff that meet to assess, monitor and determine how to respond to an event. • Emergency Operations Centers • Department Operations Centers • Multi-Agency Coordination Groups
Erosion	The collapse, undermining or subsidence of land along the bank of a body of water. Erosion is caused by waves or currents of water and can result in flooding or failure of adjacent structures.
Federal Emergency Management Agency (FEMA)	The Federal agency under which the National Flood Insurance Program (NFIP) is administered. In March 2003, FEMA became part of the newly created U.S. Department of Homeland Security. An agency within the U.S. Department of Homeland Security charged with responding to Presidentially-declared disasters.
Flash Flood or Flashy System	A flood that reaches its peak flow in a short length of time (hours or minutes) after the storm or other event causing it. Often occurs in watersheds with mostly storm drain runoff and is often characterized by high velocity flows.
Flood Control	Keeping flood waters away from specific developments and/or populated areas by the construction of flood storage reservoirs, channel alterations, dikes and levees, bypass channels, or other engineering works.
Flood Fighting	Actions taken immediately before or during a flood to protect human life and to reduce flood damages such as evacuation, emergency sandbagging and diking, and provision of assistance to flood victims.
Flood Flow	The discharge at which a body of water begins to flow over its banks and onto dry land, usually expressed in cubic feet per second (cfs).
Flood Forecasting	The process of predicting the occurrence, magnitude and duration of an imminent flood through meteorological and hydrological observations and analysis.
Flood Frequency	A statistical expression of the average time period between floods equaling or exceeding a given magnitude. For example, a 100-year flood has a magnitude expected to be equaled or exceeded on the average of once every hundred years; such a flood has a one-percent chance of being equaled or exceeded in any given year. Often used interchangeably with “recurrence interval”.

TERM	DEFINITION
Flood Insurance Rate Map (FIRM)	An official map of a community on which the Federal Insurance Administration has delineated the area in which the purchase of flood insurance is required under the National Flood Insurance Program.
Flood Stage	The level at which a body of water begins to flow over its banks and onto dry land, usually expressed in feet above channel bottom or above sea level at a specific location.
Flooding – Fluvial or Riverine	Fluvial, or riverine flooding, occurs when excessive rainfall over an extended period of time causes a river to exceed its capacity.
Flooding – Surface or Local Drainage	When rain hits the ground quicker than it can drain or flow away, water builds up and develops the potential to flood streets and properties. In some places, it forms isolated puddles in ground depressions and in others it accumulates and flows downhill towards streams. Typically, surface water flood events have localized effects, impacting properties in close proximity to where the rain fell and for a short amount of time until it can drain into a stream, be pumped into a stream, percolate into the ground, or evaporate.
Floodplain	Any land area susceptible to being inundated by floodwaters from any source. The channel of a stream or watercourse is part of the floodplain.
Floodplain Management	The operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to, emergency preparedness plans, flood-control works and floodplain management regulations. Floodplain management is a decision-making process that aims to achieve the wise use of the nation's floodplains. "Wise use" means both reduced flood losses and protection of the natural resources and function of floodplains.
Floodplain Management Regulations	A general term for the full range of codes, ordinances, and other regulations relating to the use of land and construction within stream channels and floodplain areas. The term encompasses zoning ordinances, subdivision regulations, building and housing codes, encroachment line statutes, open-space regulations, and other similar methods of control affecting the use and development of these areas.
Freeboard	A margin of safety added to the flood elevation to account for waves, debris, miscalculations, or lack of data. This term is often used when describing distance of the water surface to top of bank of a stream or in determining the level at which a structure's lowest floor must be elevated or floodproofed to be in accordance with state or community floodplain management regulations.
High Flow Stage	The depth of water when a stream flood control facility is nearing flood stage or design stage.
Incident Commander (IC)	The Incident Commander is the individual responsible for all incident response activities, including the development of strategies and tactics and the ordering and release of resources. The Incident Commander has overall authority and responsibility for conducting incident operations and is responsible for the management of all incident operations at the incident site.
Incident Command System (ICS)	The Incident Command System (ICS) is a standardized management system designed to enable effective and efficient incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.

TERM	DEFINITION
Levee or Dike	Permanent or temporary mounds of earth (often engineered with maintenance roads on top) and/or fill, such as sand, sandbags or gravel, piled along a body of water to prevent it from overflowing onto dry land.
Long Range Acoustical Device (LRAD)	LRAD is a high powered speaker system that emits a shrill sound followed by spoken instructions such as “shelter in place” or “flooding is imminent, evacuate now”. The speakers are strategically mounted to cover wide areas as needed. This system cannot only wake you up, but inform you as to what’s going on.
Multi-Agency Coordination (MAC)	The primary function of a MAC is to coordinate activities above the field level and to prioritize the incident demands for critical or competing resources, thereby assisting the coordination of the operations in the field. A MAC consists of a combination of elements: personnel, procedures, protocols, business practices, and communications integrated into a common system. For the purpose of coordinating resource and support between multiple jurisdictions, a MAC can be implemented from a fixed facility or by other arrangements outlined within the system.
National Flood Insurance Program (NFIP)	The program of flood insurance coverage and floodplain management administered under the Act and applicable federal regulations promulgated in Title 44 of the Code of Federal Regulations, Subchapter B.
Recovery Activities	Activities that include the development, coordination, and execution of service- and site-restoration plans; the reconstitution of government operations and services; individual, private-sector, nongovernmental, and public-assistance programs to provide housing and to promote restoration; long-term care and treatment of affected persons; additional measures for social, political, environmental, and economic restoration; evaluation of the incident to identify lessons learned; post-incident reporting; and development of initiatives to mitigate the effects of future incidents.
Stage or Gauge Height	The water-surface elevation referred to some arbitrary datum. The stage or gauge height represents the water-surface elevation above the channel bottom elevation at a specific location. For example, the elevation of the datum (channel bottom) of the gauge might be 100.00 feet, which, when added to a stage of 12.50 feet, represents a water-surface elevation of 112.50 feet at that location.
Top of Bank	Top of Bank means the point along the bank of a stream where an abrupt change in slope is evident, and where the stream is generally able to overflow the banks and enter the adjacent floodplain during an annual flood event. For steep and narrow valleys, it will generally be the same as the top of slope.
Unified Command	A unified command is established when incidents under an area command are multi-jurisdictional. It is a method for all agencies or individuals who have jurisdictional responsibility, or in some cases who have functional responsibilities at the incident, to contribute to: determination of overall objectives for the incident, and selection of strategies to achieve the objectives.

APPENDIX A

Coyote Creek

PURPOSE

This Appendix to the City, Valley Water and other Stakeholders Joint Emergency Action Plan (EAP) for Severe Storms and Flooding is meant to provide additional guidance specific to Coyote Creek. It will not duplicate information already in an EOP or the EAP, but will provide Coyote Creek specifics for:

1. Incident detection
2. Evaluation and readiness level classification
3. Notification and communications
4. Emergency actions

COYOTE CREEK DESCRIPTION

The Coyote watershed is located on the east side of Santa Clara County and encompasses an area of over 320 square miles that has three reservoirs (Anderson, Coyote, and Cherry Flat) located in the upper watershed areas. The watershed drains from south to north and includes the entire City of Milpitas, eastern portions of San José, portions of Morgan Hill and unincorporated lands within eastern Santa Clara County. Water flows into Coyote Creek through local drainage systems and through 29 tributaries, of which Upper Penitencia Creek, Berryessa Creek, Lower Silver Creek, Upper Silver Creek and Fisher Creek flow directly into Coyote Creek below the reservoirs.

Below Anderson Dam, Coyote Creek is about 42 miles in length and is crossed by Highways 101 and 237, Interstates 880 & 280, Metcalf Road, Silver Creek Valley Road, Yerba Buena Road, Capitol Expressway, Tully Road, Story Road, East William Street, San Antonio Road, Santa Clara Street, Julian Street, Mabury Road, Berryessa Road, Oakland Road, Brokaw Road, Montague Road, and Tasman Drive.

About 32 miles of the 42 miles of Coyote Creek downstream of Anderson Dam is unimproved, much of it heavily vegetated, with a variety of adjacent land uses, such as golf courses, open space, parks, residences and businesses. Over 5 miles of improvements between the San Francisco Bay and Montague Expressway were completed in 1995 to protect North San José, Alviso, and Milpitas from a 100-year flood. In addition, a short section of levee and floodwall were constructed to provide about 25-year flood protection for the Golden Wheel and South Bay Mobile Home Parks downstream of Berryessa Road. And there have been other modifications that add up to about 5 miles of additional improvements.

There are several projects currently underway on Coyote Creek and Anderson Dam. Valley Water is implementing an Anderson Dam Seismic Retrofit Project (ADSRP) scheduled for completion by 2032 that will protect the community from a catastrophic dam failure in the event of an earthquake. And Valley Water is designing a Coyote Creek Flood Protection Project (CCFPP) that should start construction by 2026 and be completed by 2028.

Due to the ongoing threat of dam failure to the community, the Federal Energy Regulatory Commission (FERC) issued an Order to Valley Water on February 20, 2020, to immediately implement risk reduction measures to be followed until completion of the ADSRP. Valley Water immediately began work to comply with the order and initiated the Anderson Dam FERC

APPENDIX A Coyote Creek (continued)

Compliance Project (FOCP) that affects Coyote Creek. The FERC Order requires the following interim risk reduction measures:

1. Immediately lower and maintain a reservoir operating level no higher than 565 feet;
2. Lower the reservoir to an elevation of 488 feet (deadpool) and maintain that elevation to the extent feasible;
3. Immediately design and construct a low-level outlet tunnel to more reliably and quickly drawdown the reservoir after an earthquake and/or to better maintain the deadpool during significant precipitation events.

Until an Anderson Dam Seismic Retrofit Project (ADSRP) is completed the current outlet is to be kept fully open to release up to 500 cfs to meet the interim reduction measures of the FERC Order. And a 2,000 cfs bypass tunnel that can be controlled is to be constructed by 2025 to supplement the existing 500 cfs outlet.

The additional releases from the reservoir will require avoidance and minimization measures downstream to mitigate impacts of the increased outlet capacity. These measures include creek modification immediately downstream of the dam and other flood management measures that includes floodwalls and levees further downstream. These measures should be completed by early 2024 prior to completion of the bypass tunnel along with changes to flood thresholds for Coyote Creek. And, prior to completion of the ADSRP that is scheduled for about 2032, the CCFPP will be completed, Anderson Dam operation rules will be developed to provide guidance for flood releases, and updates to the flood thresholds will be evaluated.

COYOTE CREEK FLOOD THREATS

The flood prone areas exist where the creek is in a more natural state, with significant vegetation, and are under a variety of ownerships that include a significant amount of private property. In the improved portions of the creek, there is a comprehensive management program to provide the design objectives of the modified creek. The unimproved areas of the creek do not have a comprehensive management program due to lack of: environmental clearances, public ownership, and a defined level of flood protection.

The two most recent flood events along Coyote Creek since the upstream reservoirs were constructed occurred in 1997 and 2017. Both of these floods primarily impacted three flood hotspots along the creek: (1) Golden Wheel and South Bay Mobile Home Parks downstream of Berryessa Road; (2) a single-family residential neighborhood near East William Street; and (3) a high-density residential neighborhood in the Rock Springs Drive area downstream of Tully Road. These floods caused considerable damage requiring evacuations and demonstrated the inherent uncertainty in estimating flood flows in a natural stream system. In addition, the increased population of encampments of unsheltered individuals in the creek has resulted in a public flood threat even at lower flows.

In addition to the three main flood hotspots, there are other locations that are considered flood hotspots or may be considered a flood risk requiring attention during high flow events. And due to the encampments of unsheltered individuals that could be located within the creek banks at nearly any location within the creek, low flow events can also cause a safety hazard.

APPENDIX A Coyote Creek (continued)

The main areas of concern for high flows and low flows are included in the Coyote Flood Readiness Levels and Severity section, but areas still at risk that are not considered flood hotspots are the improved reaches downstream of Montague Expressway that are protected by levees. Because of the flood risk, these areas are important to monitor and inspect before, during and after storm events. These areas are shown on FEMA Flood Insurance Rate Maps (FIRMs) as Zone X – Area with Reduced Flood Risk due to Levee. The FIRMs can be found at <https://msc.fema.gov/portal/search>.

FLOOD EVENT DETECTION

There are several detection methods that are described in the EAP that include weather forecasts, hydrologic/hydraulic modeling, Automated Local Evaluation in Real Time (ALERT) stream/reservoir/precipitation gauge systems, and field observation of stage gauges and other areas of high flow.

Of these methods, the gauging and field observation methods specific to Coyote Creek are described below:

Surface Water Gauge System

A listing of all gauges in the Coyote Watershed can be found at Valley Water Surface Water Data Portal – <http://alert.valleywater.org>. These gauges provide data in near real-time at several locations on Coyote Creek and for all major tributaries downstream of the reservoirs. Upstream gauges will provide valuable information for flood events occurring downstream and may give many hours' notice to take action. [Table 1A](#) shows approximate travel times between key points along Coyote Creek.

The following is a summary of the current stream gauge program.

1. Annually sites will be prioritized for manual gauging and teams are assigned.
2. After every high flow event, the rule curves (depth versus discharge) are updated/calibrated. High flow calibration on Coyote Creek gauges was done after the 1997 event and again after the 2017 event.
3. ***The Madrone gauge is considered more accurate for prediction downstream flood depths when Anderson reservoir spills due to the channel characteristics.*** The Edenvale gauge is sometimes used and is part of the NWS forecast modeling; however, it has a lower level of confidence due to potential backflow conditions.

Visual Observations

Visual observations can be critical to verify what is occurring because gauges are not always a reliable source of information and modeling information can vary from the actual condition. In addition, there are other known hot-spots and facilities that should be visually checked during high flows. Supplementing with visual observations from staff deployed in the field (i.e., Field Information Teams), online WebCams found in the Valley Water Surface Water Data Portal – <http://alert.valleywater.org> to remotely observe water levels, and other field reporting is an important component to detection.

APPENDIX A Coyote Creek (continued)

To allow additional information to be accurately gathered, several visual stream stage monitoring locations have been installed for observations. These are located at:

Rock Springs:

- Lookout location is driveway entrance to stables.
- The 'circuit' for this monitoring station will include the entire Rock Springs area, including Bevin Brook Court.

East William Street:

- Stage gauge installed on pedestrian bridge.
- Lookout location will be from the vehicular bridge.
- Circuit would include William Street Park, Selma Olinder Park, school, and surrounding neighborhood.

Mabury Road:

- Stage gauge installed on middle pier of the bridge.
- Lookout location on the northeast side.
- Circuit would include Watson Park, City Yard, Trailer Park and Truck Driving School.

Berryessa Road:

- Stage gauge installed on bridge pier.
- Lookout location on northeast side by trailhead.
- Circuit would include Industry areas on west side of the creek and the Mobile Home Park.

Charcot Road:

- Stage gauge installed on bridge pier.
- Lookout location can be on either side of the creek.
- Circuit would be the bridge location.

Valley Water operates Field Information Teams (FITs) that are assigned to specific locations during storms and high flow events to provide this valuable information. In addition, the City also deploys FIT teams in a coordinated way to assure that all critical locations are being monitored. Locations of FIT deployment by the City and Valley Water may overlap during storm and flood events. The MAC Group will coordinate this effort through the Planning/Intelligence Section so that resources are most effectively utilized and information is shared.

**APPENDIX A
Coyote Creek (continued)**

Valley Water Hot-Spots for possible FIT deployment are:

1. Visual stream gauges—checking for high water and rate of change
2. Known Flood Hot-Spots (Attachment 11 pages 51-56)
3. Real-time Flooding—documenting flooding
4. Bridge Piers—checking for debris blockages
5. Trash Racks—checking for debris blockages
6. Mobile Home Park Levee downstream of Berryessa Road—check for stability
7. Sandbag sites—checking for supply and access issues
8. Previously repaired or other project sites—checking for performance
9. Raw water facilities—dams and canals

COYOTE FLOOD READINESS LEVELS AND SEVERITY

Sometimes an event is a flash flood that occurs suddenly without much early notice. However, with weather forecasting and Coyote Creek modeling there is often an ability to estimate flood events before they occur. This is extremely valuable when preparing for necessary evacuations and road closures, however, this information should be used as guidance only and not with absolute certainty.

To provide this advanced notice, a readiness level will be used to provide an indicator of preparedness for a response and a level of potential severity for areas subject to flooding to assist the Agency’s in planning and implementing appropriate actions. Because of the uncertainties of modeling in the future, a level of Watch will be used when flood stage is estimated about 24 to 48 hours or more in the future. If flooding is estimated within about 24 hours, the level will be elevated to Warning. In addition, an unexpected situation may occur during high flows that may result in a change in readiness level (Attachment 12 – Guidance Table for Evaluating Facility During High Flow and Determining Readiness Level).

PREPAREDNESS	<p>This is the base stage of readiness that will be the typical condition throughout most of the year. Preparedness is defined as:</p> <ul style="list-style-type: none"> • Flood stage (Minor Flooding or greater) is not estimated within the next 72 hours or • Measured stream depth is below 50% of flood stage.
MONITORING	<p>This condition is variable and requires more intense monitoring and a heightened level of alertness. A portion of the Emergency Management Organization (EMO) may be active to monitor for any developing flood concern. Monitoring is defined as:</p> <ul style="list-style-type: none"> • Flood stage may occur in 48 to 72 hours, or • Measured stream depth is at 50% to 70% of flood stage, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or near design stage within 24 hours.
WATCH	<p>Flood level or a serious flood threat is expected to occur. Multiple portions of the EMO may be activated at an appropriate level. Watch is defined as:</p> <ul style="list-style-type: none"> • Stream depth is estimated to reach flood stage or greater within 24 to 48 hours, or • Measured stream depths are at 70% to 100% of flood stage, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater than design stage within 6-12 hours.

**APPENDIX A
Coyote Creek (continued)**

WARNING	<p>This is a more urgent situation with flooding imminent or occurring. The EMO is more completely active. Warning is defined as:</p> <ul style="list-style-type: none"> • Flood stage or greater is occurring or is estimated to occur within 24 hours, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater within minutes/hours or is occurring. <p><u>Note:</u> Flood stage is the depth of water at which a stream or facility begins flooding (see Glossary of Terms).</p>
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When the level is at a Watch or Warning, there is an expectation that flooding will occur or is occurring at some locations. The severity of the situation at specific locations is determined by the flood stage. The areas subject to flooding for different stream stages are estimated utilizing hydraulic models and flood maps from the 1997 and 2017 floods.

Flood severity categories are defined by the NWS as:

Action	An established gauge height which when reached by a rising stream, lake, or reservoir represents the level where action is taken in preparation for possible significant hydrologic activity.
Minor Flooding	Minimal or no property damage, but possibly some public threat (e.g., inundation of roads).
Moderate Flooding	Some inundation of structures and roads near stream, evacuations of people and/or transfer of property to higher elevations.
Major Flooding	Extensive inundation of structures and roads, significant evacuations of people and/or transfer of property to higher elevations.

A 2017 flood inundation map of Coyote Creek is shown in [Figure 1A](#) and the associated Flood Thresholds [Table 2A](#) on the following page. The map is the Federal Emergency Management Agency (FEMA) 1 percent flood map. This map is based on the best available information and modeling when it was created and should be considered approximate due to the difficulty in estimating an actual event and the changing conditions of the creek.

[Table 3A](#) is a flood severity table for the Madrone Gauge that is used to estimate areas that will be subject to flooding on Coyote Creek. There may be additional flood severity threshold information found for other gauges (i.e., Edenvale, Williams Street, and Berryessa Road) in the Valley Water Surface Water Data Portal - <https://alert.valleywater.org/map?p=map&disc=f>. Mapping associated with this table will be provided to Agency Stakeholders during an event if deemed necessary. By utilizing the [Table 1A](#) for travel times and actual measurements at Madrone, the time for a flood flow to reach a given location can be estimated.

The flood stage can either be estimated by using weather forecasts to model stream depths at that location or may be based on actual measurements. This information would be used to establish readiness levels and severity levels for specific areas subject to flooding. Valley Water and City will coordinate with the National Weather Service to be consistent in the readiness level and severity category. The most current information regarding flood severity and flood thresholds is available at <https://alert.valleywater.org/map?p=map>.

APPENDIX A Coyote Creek (continued)

Below are examples of how the tables should be used.

EXAMPLE 1

Situation: Stream depth at the Madrone gauge is currently at 5 feet and estimated to reach 10 feet in 24 hours.

Analysis: Using [Table 3A](#) the 5-foot stage is below flood stage, however, the Flood Severity for a 10-foot stage predicted to occur in 24 hours would be described as **Moderate Flooding**. And, because the 10-foot stage is expected in 24 hours at Madrone Gauge and all travel times to flood hotspots are less than 17 hours from this gauge, the readiness level would be set as **Flood Watch** (24 to 48 hours). The specific areas subject to flooding are described in [Table 3A](#) for 10-foot stage and below.

EXAMPLE 2

Situation: Stream depth at the Madrone gauge is currently measured at 13 feet.

Analysis: [Table 3A](#) describes the Flood Severity as **Major Flooding** for a 13-foot stage at the Madrone gauge. And, the readiness level should be set as **Flood Warning**, since travel times shown on [Table 1A](#) are less than 24 hours.

EXAMPLE 3

Situation: Stream gauge at William Street Bridge is observed to be at 23 feet.

Analysis: Using information from [Table 2A](#), the readiness level would be **Flood Warning** for ID#'s 4a & 4b (three low-lying structures on 17th Street along the creek bank and the park east of Coyote Creek), and **Flood Watch** for ID# 4c (low lying homes on the west side of Coyote Creek).

The figures and tables on the following pages identify flood thresholds and triggers for actions at the flood hot-spots.

Notifications and Activity/Actions: Based on the readiness level and flood severity level, notification activity/actions will be taken by both the City, Valley Water and other Stakeholders. The level of activity will be guided by the best information available to the Agency Subject Matter Experts (SMEs) and Agency Coordinators (ACs). The level of activity may mirror those activities of the individual jurisdictional Emergency Operations Centers (EOCs). As weather conditions merit and monitoring take place, the SMEs and ACs may be in their home offices or their jurisdiction's EOC, if activated. The "call to action" may be a series of phone calls among the SMEs and ACs to determine the best approach to coordination.

Special notifications may be required following completion of the FERC Order Compliance Projects 2,000 cfs bypass tunnel that will significantly increase the discharge capacity of Anderson Dam. Because encampments may be affected by low flows, this may require additional measures be taken during lower flow events if the encampments are in a possible inundation area within the creek banks.

The Volume 1 Table 3 and Attachments 3-7 provide general guidance on the types of notifications and actions that should take place for Coyote Creek.

**APPENDIX A
Coyote Creek (continued)**

INFRASTRUCTURE AT RISK

There are important infrastructure and facilities at risk of flooding. Based on intelligence gathered during the storm event, the MAC will determine the risk and provide notifications as appropriate. The facilities below are within the area where people, property, and infrastructure may be at risk:

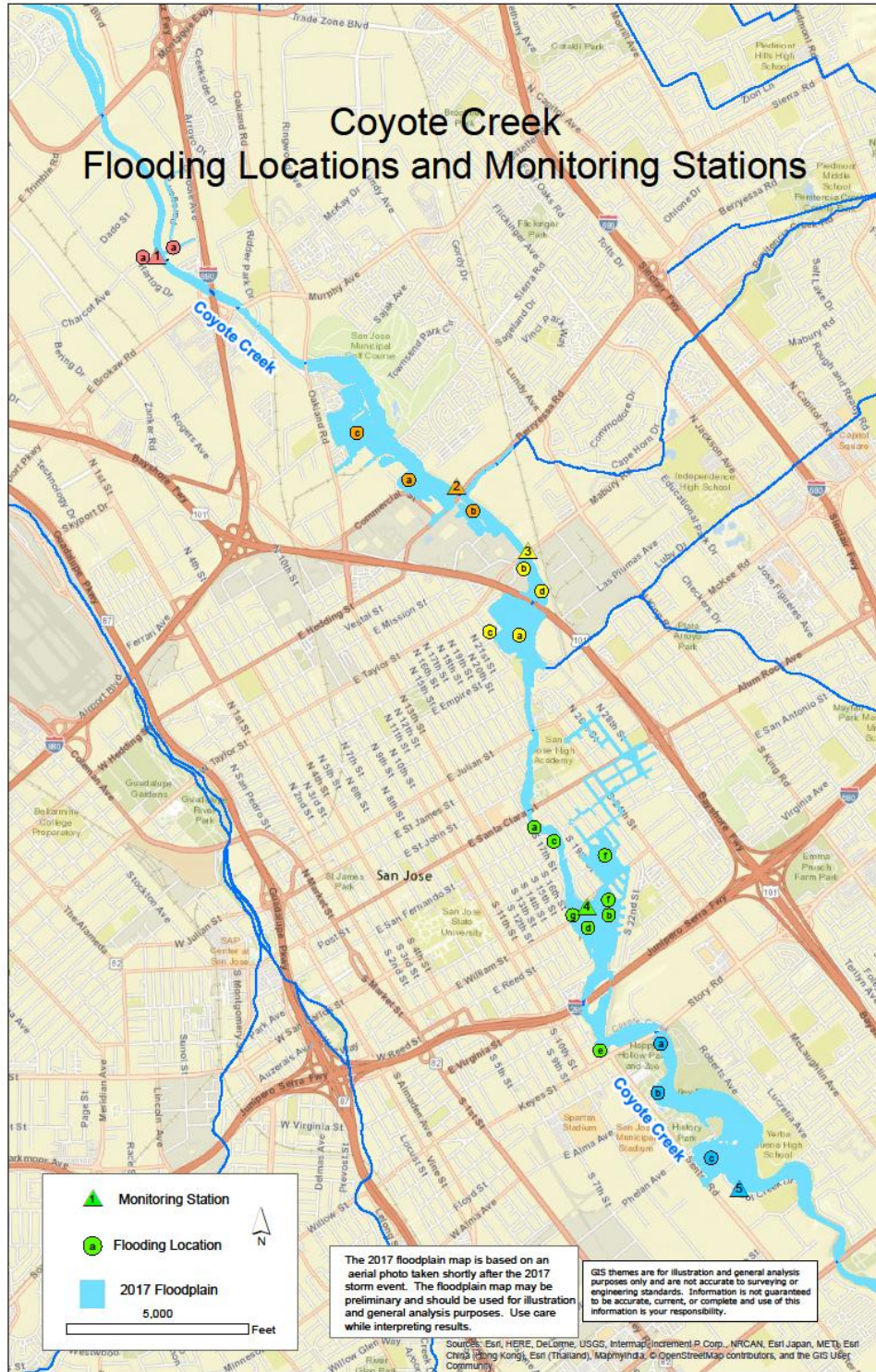
FACILITY TYPE	NAME	ADDRESS	PHONE
School	Olinder Elementary School San José Unified School District	890 East William Street San José, CA 95116	(408) 535-6000
	McKinley Elementary School Franklin-McKinley School District	651 Macredes Avenue San José, CA 95116	(408) 283-6000
	San José High School San José Unified School District	275 North 24th Street San José, CA 95116	(408) 535-6000
	Empire Gardens Elementary School San José Unified School District	1060 East Empire Street San José, CA 95112	(408) 535-6000
Utilities	PG&E Metcalf Transmission Substation	150 Metcalf Road San José, CA 95138	(800) 743-5000
Other	Hibbit's Family Stables	1896 Senter Road San José, CA 95112	(408) 998-2872 or (408) 478-9182

**APPENDIX A
Coyote Creek (continued)**

**TABLE 1A
Coyote Creek Travel Times**

Estimated Peak Travel Times for 2017 February Flood Event (rounded to the nearest half hour)											
	Madrone Gauge (Anderson Spillway)	Coyote Creek Golf Drive	Edenvale Gauge	Singleton Road Crossing	Tully Road	Rock Springs	East William Street	Watson Park	Berryessa Road	South Bay MHP	Charcot Road
Madrone Gauge (Anderson Spillway)	-	-	-	-	-	-	-	-	-	-	-
Coyote Creek Golf Drive	4:00	-	-	-	-	-	-	-	-	-	-
Edenvale Gauge	5:30	1:30	-	-	-	-	-	-	-	-	-
Singleton Road Crossing	8:00	4:00	2:30	-	-	-	-	-	-	-	-
Tully Road	10:00	6:00	4:30	2:00	-	-	-	-	-	-	-
Rock Springs	10:30	6:30	5:00	2:30	0:30	-	-	-	-	-	-
East William Street	13:00	9:00	7:30	5:00	3:00	2:30	-	-	-	-	-
Watson Park	15:00	11:00	9:30	7:00	5:00	4:30	2:00	-	-	-	-
Berryessa Road	15:30	11:30	10:00	7:30	5:30	5:00	2:30	0:30	-	-	-
South Bay MHP	16:00	12:00	10:30	8:00	6:00	5:30	3:00	1:00	0:30	-	-
Charcot Road	17:00	13:00	11:30	9:00	7:00	6:30	4:00	2:00	1:30	1:00	-
Highway 237 USGS Gauge	17:30	13:30	12:00	9:30	7:30	7:00	4:30	2:30	2:00	1:30	0:30
Disclaimer: The peak travel times in this table are based on data collected during high flows and flood events. Flood may happen before flow peaks. The data may be preliminary and should be used for general analysis purposes. Use care while interpreting results.											




**APPENDIX A
Coyote Creek (continued)**




**FIGURE 1A
Coyote Creek Flooding Locations and Monitoring Stations**

**APPENDIX A
Coyote Creek (continued)**


**TABLE 2A
Coyote Creek Flood On-Site Monitoring Thresholds**

ID#	Index Location	Flooding Description	FLOOD READINESS STAGE AT MONITORING LOCATION				MONITORING LOCATIONS	PHOTO
			50% Capacity	70% Capacity	100% Capacity	2017 Flood High Water Mark		
1a	Charcot	Charcot Bridge overtops, flooding in streets and eventually threatening nearby businesses.	14' to 15'	16' to 17'	18' to 19'	18.9'	Charcot Road Bridge	
2a	Downstream Berryessa Rd—Industrial	Businesses west of Coyote Creek floods. Automotive junkyard and concrete plant at risk.	5' to 6'	6' to 7'	8' to 9'	16.1'	Berryessa Road Bridge	
2b	Upstream Berryessa Rd—Industrial	Industrial area west of Coyote Creek floods threatening businesses.	10' to 11'	12' to 13'	13' to 14'			
2c	Mobile Home Parks	Levee to the west of Coyote Creek overtops, flooding streets and homes. Businesses near the railroad tracks at risk.	12' to 13'	14' to 15'	15' to 16'			
3a	Watson Park	Dog park begins to flood first, followed by the Watson Park.	12' to 13'	13' to 14'	15' to 16'	22.0'	Mabury Road Bridge	
3b	RV Storage Lot	RV Lot west of Coyote Creek flooded.	13' to 14'	16' to 17'	18' to 19'			
3c	Watson Park Neighborhood	Streets immediately to the west of Watson Park begin to flood.	15' to 16'	18' to 19'	20' to 21'			
3d	CSJ Mabury Yard	Coyote Creek overtops the east bank, flooding the city of San José Yard.	17' to 18'	19' to 20'	22' to 23'			

**APPENDIX A
Coyote Creek (continued)**

ID#	Index Location	Flooding Description	FLOOD READINESS STAGE AT MONITORING LOCATION				MONITORING LOCATIONS	PHOTO
			50% Capacity	70% Capacity	100% Capacity	2017 Flood High Water Mark		
4a	17th Street – Lowest Homes	Three low-lying structures begin to flood.	15' to 16'	18' to 19'	20' to 21'	33.3'	William Street Bridge	
4b	Selma Park	Park east of Coyote Creek begins to flood.	18' to 19'	21' to 22'	24' to 25'			
4c	17th St & Arroyo Way	Several low-lying homes located very near the Creek on the west side begin to flood.	19' to 20'	22' to 23'	25' to 26'			
4d	William Street Park	Coyote Creek Trail & Park, including Olinder School baseball field, begin to flood.	22' to 23'	25' to 26'	28' to 29'			
4e	NE of 12th & Keyes Streets	Car ports – located on the first floor of two-story apartment buildings – begin to flood.	14' to 15'	16' to 17'	17' to 18'			
4f	Olinder Neighborhood and School	Selma Park fills and overflows to the northeast, flooding streets, the school, and homes. Water does not return to creek and flows northeasterly through streets.	26' to 27'	29' to 30'	31' to 32'			
4g	Area northwest of E. William St.	E. William St. overtops on the west side of Coyote Creek, flooding homes, backyards, and streets.	27' to 28'	30' to 31'	32' to 33'			

**APPENDIX A
Coyote Creek (continued)**

ID#	Index Location	Flooding Description	FLOOD READINESS STAGE AT MONITORING LOCATION				MONITORING LOCATIONS	PHOTO
			50% Capacity	70% Capacity	100% Capacity	2017 Flood High Water Mark		
5a	Happy Hollow Zoo	Low lying areas, including animal enclosures begin to flood.	13' to 14'	15' to 16'	17' to 18'	20.6'	Rock Springs Stable Drive	
5b	Kelley Park	Park begins to flood.	14' to 15'	16' to 17'	17' to 18'			
5c	Rock Springs Neighborhood	Homes and streets begin to flood.	17' to 18'	19' to 20'	20' to 21'			

Disclaimer: The flooding thresholds in this table are based on hydraulic modeling results calibrated with data collected during high flows and flood events. Hydraulic modeling results are estimates. Information is accurate within the model limitations and assumptions/data used for model development. The most current flood severity thresholds are at <https://alert.valleywater.org/map?p=map>. Use care while interpreting results.

**APPENDIX A
Coyote Creek (continued)**

**TABLE 3A
Madrone Gauge Flood Severity Thresholds**

Madrone Gauge Thresholds	Stage (ft)	Description
Action	6	<ul style="list-style-type: none"> • Low flow crossings across Coyote Creek will be inundated. Encampments of unsheltered individuals could be impacted.
Minor Flooding	7	<ul style="list-style-type: none"> • Flooding to low lying businesses northwest of Berryessa Road and Coyote Creek. • Horse Ranch opposite the Rock Springs Neighborhood at risk of flooding. • Watson Park and Coyote Creek Trail at Selma Park begins to flood. • Homes in the creek along Arroyo Way and 17th Street northwest of East William Street begin to flood. • Flooding to businesses northwest of Berryessa Road and Coyote Creek.
Moderate Flooding	9	<ul style="list-style-type: none"> • Apartments that back onto Coyote Creek at the intersection of Keyes Street and South 12th Street begin to flood lower level garages. • Watson and Selma Parks flooding. • Homes along Arroyo Way and 17th Streets, and homes northwest of William Street and the creek flood. • Flooding beings at Williams Street Park, Happy Hollow Zoo and Kelley Park. • Berryessa Road is at risk of localized street flooding, with business northwest of Berryessa Road and Coyote Creek flooding. • Sycamore Avenue accessing the Boys Ranch Detention Facility at risk of inundation. • Low areas in Happy Hollow Zoo affecting structures and animals flood. • Olinder school begins to flood. • Watson, Selma, Kelley, and William Street Parks are flooding. • Low areas of Roosevelt Park are flooded. • Woodborough Drive starts to become inundated. • A few homes located in the RV storage lot south of Mabury Road may flood. • Business northwest and southwest of Berryessa Road and Coyote Creek flood.

**APPENDIX A
Coyote Creek (continued)**

Madrone Gauge Thresholds	Stage (ft)	Description
Major Flooding	11	<ul style="list-style-type: none"> • Sycamore Avenue accessing the Boys Ranch Detention Facility flooded. • Selma Park inundated and overflows into Olinder Neighborhood, with minor flooding at Olinder School. William Street Park is inundated. • Watson Park inundated and begins to flood Monfernio Drive. • RV Storage lot north of US-101 flooded. • Flooding in the offices and industrial areas north and south of Berryessa Road west of the creek. The floodwall on the south side of Golden Wheel and South Bay Mobile Home Parks begin to overtop. • If Creek rises further: Adjacent Malaguerra Avenue intersections inundated. • Flooding to Kelley Park and Happy Hollow Zoo. • Rock Springs neighborhood levee may be overtopped. • Apartments that back onto Coyote Creek at the intersection of Keyes Street and South 12th Street may flood at lower levels.
Historical High Water	12.06'	February 2017
<p>Disclaimer: The flooding thresholds in this table are based on hydraulic modeling results calibrated with data collected during high flows and flood events. Hydraulic modeling results are estimates. Information is accurate within the model limitations and assumptions/data used for model development. This table is current as of the publishing of this document. The most current flood severity thresholds are at https://alert.valleywater.org/map?p=map. Use care while interpreting results.</p>		

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APPENDIX B

Guadalupe River

PURPOSE

This Appendix to the Joint Emergency Action Plan (EAP) for Severe Storms and Flooding Response in the City of San José (City) is meant to provide additional guidance specific to Guadalupe River. It will not duplicate information already in an Emergency Operations Plan (EOP) or the EAP, but will provide Guadalupe River specifics for:

1. Incident detection
2. Evaluation and readiness level classification
3. Notification and communications
4. Emergency actions

GUADALUPE RIVER DESCRIPTION

The Guadalupe River begins about a half mile upstream of Blossom Hill Road at the confluence of Guadalupe Creek and Alamos Creek and flows about 20 miles through Santa Clara County and the City of San José. Adjacent land uses are predominantly residential and commercial and includes the urban areas of Downtown San José. Its watershed drains about 170 square miles of Santa Clara County and City of San José and is bounded on the south and southwest by the Santa Cruz Mountains, on the west by San Tomas and Saratoga Creeks watershed, and on the east by Coyote Creek watershed. The three major tributaries that flow into the river are: Los Gatos Creek; Canoas Creek; and Ross Creek. Six reservoirs in the upper watershed area of Guadalupe River that store water primarily for ground water recharge are: Lake Elman, Lexington Reservoir and Vasona Reservoir along Los Gatos Creek; Guadalupe Reservoir on Guadalupe Creek; Almaden Reservoir on Alamos Creek; and Calero Reservoir on Calero Creek.

The river is crossed by many major roadways that include: Highways 85, 87, 101 and 237; Interstates 880 & 280; Blossom Hill Road; Capitol Expressway; Almaden Expressway; West San Carlos Street; West Santa Clara Street; West Taylor Street; Montague Expressway; and Tasman Drive. There are also bike/pedestrian paths along a majority of the river length, light-rail that runs along some of its length with several crossings, and it is crossed by three wooden railroad trestles.

All of the Guadalupe River has been modified over the years for purposes either beneficial to adjacent land owners (e.g., flood protection, water conservation or land reclamation) or by governmental agencies to provide the community flood protection and/or environmental restoration/protection. Projects that provide 100-year (1 percent) flood protection have been completed from the San Francisco Bay to about a half mile upstream of Interstate 280. The remaining upstream reaches of the Guadalupe River are currently being studied by the Santa Clara Valley Water District (Valley Water) and U.S. Corps of Engineers for flood protection improvements.

APPENDIX B Guadalupe River (continued)

GUADALUPE RIVER FLOOD THREATS

Flooding threats exist along all of Guadalupe River from the San Francisco Bay to Blossom Hill Road with the greatest risk of flooding in the Upper Guadalupe River upstream of Interstate 280 where flood protection improvements have not been completed. Because the flood protection improvements north of I-280 include levees, floodwalls, and many roadway crossings, these areas are still considered a threat for flooding due to potential failures, unforeseen channel blockages, or unusually large storm events.

There are several flood hotspots on the Upper Guadalupe River. Two of the more severe threats are flooding from Ross Creek and Canoas Creek caused by high water levels in Guadalupe River. The water that overbanks Ross Creek due to high water in Guadalupe River flows northerly on the west side of the river through residential/commercial properties towards the interchange of Highway 87 and Interstate 280. Waters that overbank Canoas Creek due to Guadalupe River flow northerly on the east side of the river through residential, commercial, and industrial properties towards the same interchange area. In addition, major flooding can occur from the Guadalupe River between Willow Glen Way and Willow Street. The flood hotspots on Guadalupe River are listed below ([Figure 1B](#)):

- North bank of Ross Creek near Almaden Expressway,
- North bank of Canoas Creek near Nightingale Drive,
- East side of Guadalupe River between Branham Lane and Capitol Expressway,
- West bank of Guadalupe River from Malone Road to Alma Road, and
- East Bank of Guadalupe River from Willow Glen Way to Willow Street.

The Ross Creek and Guadalupe River at Alma flood locations can be controlled purely by storm drain runoff and reach peak stage very quickly. These are considered flashy systems.

Land uses at risk of flooding include mostly homes and businesses, however there are some significant infrastructure also at risk of flooding. Deep floodwaters could enter Highway 87 and Interstate 280 near their interchange resulting in major highway closures and traffic disruptions that could last several days. The Valley Transportation Authority Light Rail service could also be disrupted in this area until flood waters recede and the tracks are cleaned.

The most recent flood along Guadalupe River that caused significant damages and disruptions occurred in 1995. There were two separate flood events that year, which impacted Highway 87, VTA's Light Rail, homes/businesses south of I-280, and many areas of downtown and north San José.

Even though there are no river related flood hotspots north of I-280 because of the flood protection improvements, flood risks still exist due to interior drainage issues behind the levees and potential for extreme storm events, levee failures, or unanticipated channel blockages. The City also operates storm water pump stations in the leveed areas in this reach of Guadalupe River. During high creek flows the additional pumping could add to already high flows and could increase risk of overtopping or add to flooding that may be occurring. The adjacent land uses that would be impacted by a flood due to an unforeseen event in this area north of I-280 include many residential, industrial, commercial and critical governmental infrastructure (e.g., sewage treatment facility). Because of the significant threat to public health and safety and disruptions if this would occur, this section is considered a potential flood threat and should be monitored and inspected during high flow conditions. [Figure 2B](#) and [Figure 3B](#) show the approximate areas at threat to flooding due to a complete hypothetical levee failure in this reach.

APPENDIX B

Guadalupe River (continued)

FLOOD EVENT DETECTION

There are several detection methods that are described in the EAP that include weather forecasts, hydrologic/hydraulic modeling, Automated Local Evaluation in Real Time (ALERT) stream/reservoir/precipitation gauge systems, and field observation of stage gauges and other areas of high flow.

Of these methods, the gauging and field observation methods specific to Guadalupe River are described below:

Surface Water Gauge System

A listing of all gauges in the Guadalupe Watershed can be found at Valley Water Surface Water Data Portal – <http://alert.valleywater.org>. These gauges provide data in near real-time at several locations on Guadalupe River and for all major tributaries downstream of the reservoirs. Upstream gauges will provide valuable information for flood events occurring downstream and may give several hours' notice to take action. Gauges in the downstream reaches will show the flood risk at specific locations and whether any unexpected event is occurring (e.g., channel blockage).

The following is a summary of the current stream gauge program.

1. Annually sites will be prioritized for manual gauging and teams are assigned.
2. After every high flow event, the rule curves (depth versus discharge) are updated/calibrated. High flow calibration on gauges in the Guadalupe River watershed was done after the 1995 flood event and again after the high flows of February 2017.
3. Predicting flood readiness levels in advance of flooding requires modeling of the watershed specific to the storm forecast. This prediction of the flood levels will be done in coordination with the NWS forecast modeling; however, Valley Waters prediction may differ from the NWS forecast. Therefore, those tools should be used for guidance.

Visual Observations

Visual observations can be critical to verify what is occurring because gauges are not always a reliable source of information and modeling information can vary from the actual condition. In addition, there are other known hot-spots and facilities that should be visually checked during high flows. Therefore, supplementing with visual observations by viewing real-time images from WebCams (Valley Water Surface Water Data Portal – <http://alert.valleywater.org>), staff deployed in the field (i.e., Field Information Teams) and other field reporting is an important component to detection.

To allow additional information to be accurately gathered, several visual stream stage monitoring locations have been installed for observations and some WebCams are installed (see the link in Attachment 2). These are located at:

1. Guadalupe River at Montague Expressway (WebCam currently available)
2. Guadalupe River at West Alma Avenue (WebCam currently available)
3. Guadalupe River at Branham Lane
4. Canoas Creek at Nightingale Drive (WebCam currently available)
5. Ross Creek at Cherry Avenue (WebCam currently available)

APPENDIX B
Guadalupe River (continued)

Valley Water operates Field Information Teams (FITs) that are assigned to monitor specific locations during storms and high flow events to provide valuable information for detection and for calibrating computer models. In addition, the City also deploys FIT teams in a coordinated way to assure that all critical locations are being monitored. The Multi-Agency Coordination (MAC) Group AC convened per the EAP and/or each jurisdictions Emergency Operations Center (EOC) will coordinate this effort through their Planning/Intelligence Section so that resources are most effectively utilized and information is shared.

Hot-Spots for possible FIT deployment are:

1. Visual stream gauges—checking for high water and rate of change
2. Known Flood Hotspots (Attachment 11 pages 72-77)
3. Real-time Flooding—documenting flooding
4. Bridge Piers—checking for debris blockages
5. Trash Racks—checking for debris blockages
6. Levees—check for stability
7. Sandbag sites—checking for supply and access issues
8. Previously repaired or other project sites—checking for performance
9. Raw water facilities—dams and canals

GUADALUPE RIVER FLOOD READINESS LEVELS AND SEVERITY

Sometimes an event is a flash flood that occurs suddenly without much early notice. However, with weather forecasting and Guadalupe River modeling there is often an ability to estimate flood events before they occur. This is extremely valuable when preparing for necessary evacuations and road closures.

To provide this advanced notice, a readiness level will be used to provide an indicator of preparedness for a response and a level of potential severity for areas subject to flooding to assist the Agency’s in planning and implementing appropriate actions. Because of the uncertainties of forecasting future conditions, a level of Watch will be used when flood stage is estimated about 24 to 48 hours or more in the future. If flooding is estimated within about 24 hours, the level will be elevated to Warning. In addition, an unexpected situation may occur during high flows that may result in a change in readiness level (Attachment 12 – Guidance Table for Evaluating Facility During High Flow and Determining Readiness Level).

PREPAREDNESS	<p>This is the base stage of readiness that will be the typical condition throughout most of the year Preparedness is defined as:</p> <ul style="list-style-type: none"> • Flood stage (Minor Flooding or greater) is not estimated within the next 72 hours or • Measured stream depth is below 50% of flood stage.
MONITORING	<p>This condition is variable and requires more intense monitoring and a heightened level of alertness. A portion of the Emergency Management Organization (EMO) may be active to monitor for any developing flood concern. Monitoring is defined as:</p> <ul style="list-style-type: none"> • Flood stage may occur in 48 to 72 hours, or • Measured stream depth is at 50% to 70% of flood stage, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or near design stage within 24 hours.

APPENDIX B
Guadalupe River (continued)

WATCH	<p>Flood level or a serious flood threat is expected to occur. Multiple portions of the EMO may be activated at an appropriate level. Watch is defined as:</p> <ul style="list-style-type: none"> • Stream depth is estimated to reach flood stage or greater within 24 to 48 hours, or • Measured stream depths are at 70% to 100% of flood stage, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater than design stage within 6-12 hours.
WARNING	<p>This is a more urgent situation with flooding imminent or occurring. The EMO is more completely active. Warning is generally defined as:</p> <ul style="list-style-type: none"> • Flood stage or greater is occurring or is estimated to occur within 24 hours, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater within minutes/hours or is occurring.
<p>Note: Flood stage is the depth of water at which a stream or facility begins flooding (see Glossary of Terms).</p>	

When the level is at a Watch or Warning, there is an expectation that flooding will occur or is occurring at some locations. The severity of the situation at specific locations is determined by the flood stage. The areas subject to flooding for different stream stages are estimated utilizing hydraulic models and flood maps.

Flood severity categories are used to describe the level of flood risk posed by the storm and are defined by the National Weather Service as:

Action	An established gauge height which when reached by a rising stream, lake, or reservoir represents the level where action is taken in preparation for possible significant hydrologic activity.
Minor Flooding	Minimal or no property damage, but possibly some public threat (e.g., inundation of roads).
Moderate Flooding	Some inundation of structures and roads near stream, evacuations of people and/or transfer of property to higher elevations.
Major Flooding	Extensive inundation of structures and roads, significant evacuations of people and/or transfer of property to higher elevations.

A flood inundation map of Guadalupe River is shown in [Figure 1B](#) and the associated Flood Thresholds in [Table 1B](#). The map is the Federal Emergency Management Agency (FEMA) 1% flood map. This map is based on the best available information and modeling when it was created and should be considered approximate due to the difficulty in estimating an actual event and the changing conditions of the creek. [Figure 2B](#) and [Figure 3B](#) show the approximate areas at threat to flooding due to a complete hypothetical levee failure in the reach north of I-280. Additional floodplain mapping may be developed as needed by Valley Water for use by the MAC.

APPENDIX B
Guadalupe River (continued)

[Table 2B](#) is a flood severity table based on the Almaden Expressway Gauge that is used to estimate areas that will be subject to flooding on Guadalupe River. Because there is very little notice for flooding based on this gauge, flood conditions will often utilize predictive methods based on weather forecast and watershed conditions. And, flood severity threshold information is available for other gauges (i.e., Highway 101, Alma Avenue, and Canoas Creek at Cherry Avenue) are available in the Valley Water Surface Water Data Portal: <http://alert.valleywater.org>.

These tables along with the actual or modeled data would allow Valley Water or MAC to establish readiness levels for specific areas subject to flooding. Mapping associated with this table will be provided to Agency Stakeholders. This information will be made available for notifications and will be coordinated with the National Weather Service to be consistent in the dissemination of readiness level and severity information. The most current information regarding flood severity and flood thresholds is available at <https://alert.valleywater.org/map?p=map>.

There is also a deployment level that may be set to place temporary flood barriers that are designed to divert upstream overland flood flows before they reach downtown San José. These barriers were a component of the Downtown Guadalupe River Flood Protection Project to help protect downtown San José from the design flood while not inducing flooding. Below is guidance for setting the deployment level.

Prepare	<ul style="list-style-type: none"> • Flood Readiness Level is set at Watch and • Flood Severity Level is set at Moderate or greater.
Mobilize	<ul style="list-style-type: none"> • Flood Readiness Level is set at Warning and • Flood Severity Level is set at Major with flooding expected to occur on: <ul style="list-style-type: none"> ○ Guadalupe River between Willow Street and Willow Glen Way and/or ○ Canoas Creek at Nightingale Drive.
Deploy	<ul style="list-style-type: none"> • Major overland flooding is occurring: <ul style="list-style-type: none"> ○ Floodwaters have reached Alma Avenue and/or ○ Floodwaters are at Lick Avenue near the Caltrain Tamien Station parking lot.

NOTIFICATIONS AND ACTIVITY/ACTIONS

General notifications and actions are described in the EAP which describes readiness level and severity, notifications and activity/actions to be taken by the City, Valley Water and other Stakeholders. The general level of activity will be guided by the best information available to the Agency Subject Matter Experts (SMEs) and Agency Coordinators (ACs). The level of activity may mirror those activities of the individual jurisdictional Emergency Operations Centers (EOCs). As weather conditions merit and monitoring take place, the SMEs and ACs may be in their home offices or their jurisdiction’s EOC, if activated. The “call to action” may be a series of phone calls among the SMEs and ACs to determine the best approach to coordination.

The City operates storm water pump stations in the leveed areas of Lower Guadalupe River north of I-280. During high creek flows the additional pumping could add to already high flows and could increase risk of overtopping or add to flooding that may be occurring. In a situation where readiness levels are at Watch or Warning, consideration should be given to modifying pump station operations.

APPENDIX B
Guadalupe River (continued)

In addition, there are specific actions and notifications that are to be taken for the Guadalupe River because of the possibility of temporary flood barrier deployments to protect Downtown San José. The deployment of temporary flood barriers was planned as part of the Downtown Guadalupe River Flood Protection Project to help protect downtown without impacting other areas for the design flood. The actions and responsibilities are described on [Table 3B](#) and deployment locations and sandbag sites are shown in [Figure 4B](#) and [Figure 5B](#). In addition, Valley Water Operations & Maintenance DOC has a more detailed Standard Operating Procedures that will guide them in their responsibilities related to the deployment.

INFRASTRUCTURE AT RISK

There are no Federal Emergency Management Agency (FEMA) defined critical facilities located in the floodplain, however, there are other important infrastructure where people, property, and important facilities may be at risk. Based on intelligence gathered during the storm event, the MAC will determine the risk and provide notifications as appropriate. Below is a listing of some of that infrastructure.

FACILITY TYPE	NAME	ADDRESS	PHONE
Schools	Galarza Elementary School San José Unified School District	1610 Bird Avenue San José, CA 95125	(408) 535-6000
	Canoas Elementary School San José Unified School District	880 Wren Drive San José, CA 95125	(408) 535-6000
	Schallenberger Elementary School San José Unified School District	1280 Koch Lane San José, CA 95125	(408) 535-6000
	Hacienda Elementary School San José Unified School District	1290 Kimberly Drive San José, CA 95118	(408) 535-6000
	Washington Elementary School San José Unified School District	100 Oak Street San José, CA 95110	(408) 535-6000
Utilities	Interstate 280 and Highway 87	Caltrans and California Highway Patrol	911 or (800) 835-5247 (if non-emergency); (707) 648-4180 (local Division of CHP)
	Light Rail at Virginia Street and near Interstate 280 where flood stop logs are installed (Figure 2B)	VTA	911 or (408) 546-7688
	Caltrain	1355 Lick Avenue San José, CA 95110	(877) 723-7245
	Southern Pacific Railroad		911 or (888) 877-7267
Other	Elks Lodge	444 West Alma Avenue San José, CA 95110	(408) 298-3880

APPENDIX B
Guadalupe River (continued)

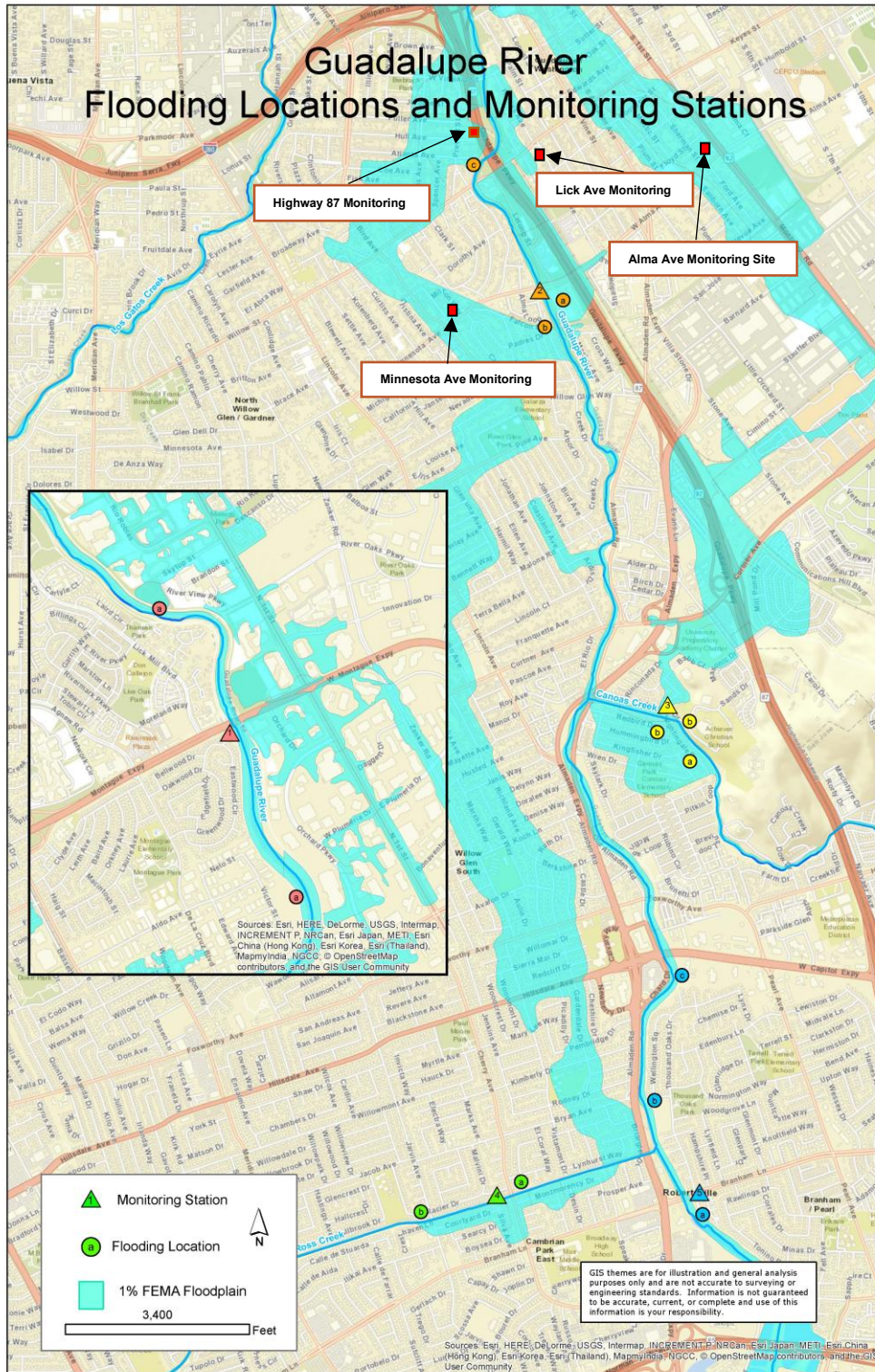
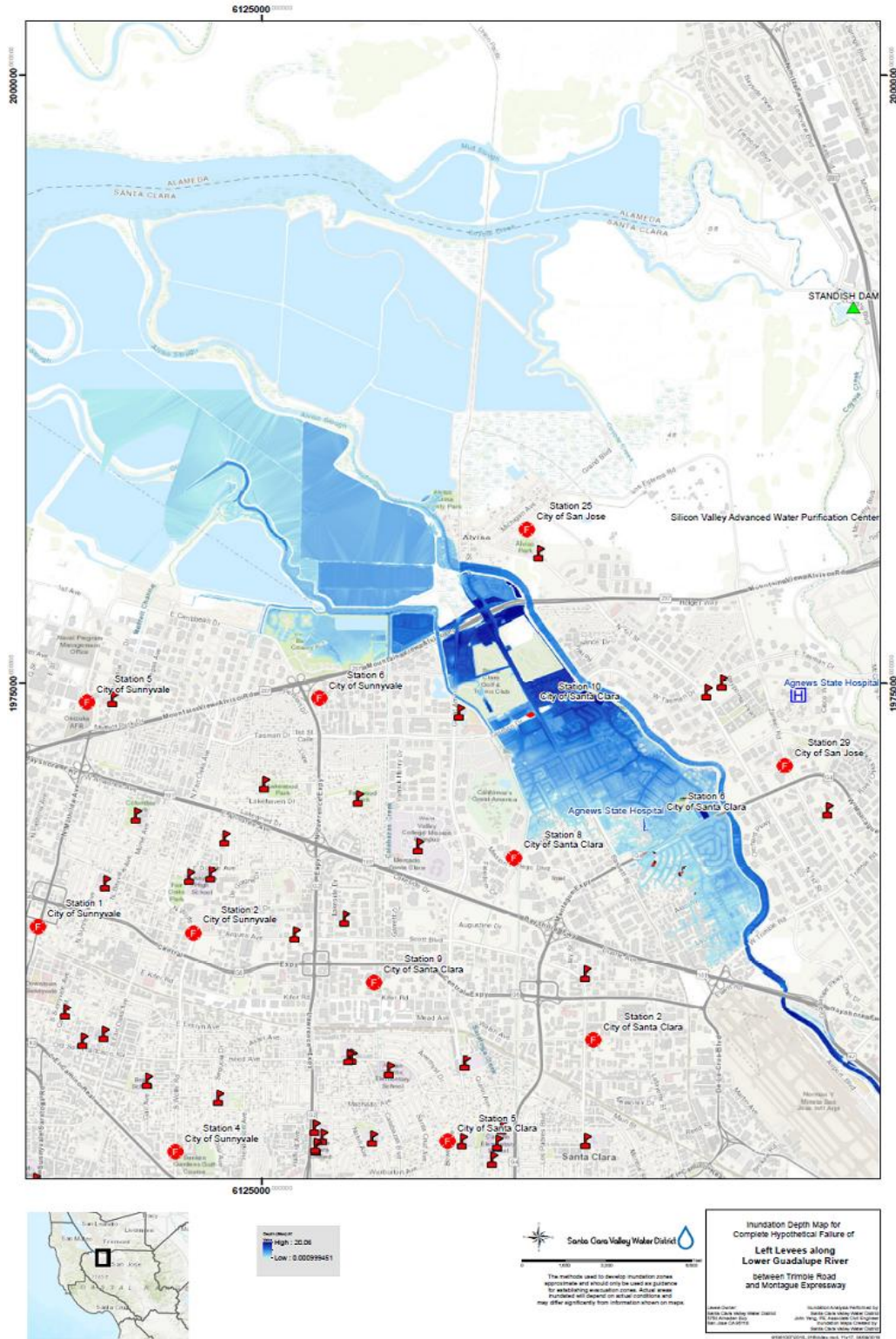


FIGURE 1B
Upper Guadalupe River 1% Floodplain



APPENDIX B Guadalupe River (continued)



**FIGURE 3B
Lower Guadalupe River
Left (West) Levee Failure Floodplain**

**APPENDIX B
Guadalupe River (continued)**



**TABLE 1B
Guadalupe River Flood On-Site Monitoring Thresholds**

ID #	Index Location	Flooding Description	Flood Readiness Stage at Monitoring Location			Monitoring Locations	Photo
			50% Capacity	70% Capacity	100% Capacity		
1a	Upstream and downstream of Montague Expressway, with the highest risk between Montague Expressway and Trimble Road	Levees overtop on both sides of the creek, flooding nearby homes and businesses. Once levees overtop, levee failure may occur, causing sudden and catastrophic damage.	20'-21'	24'-25'	30'-31'	Montague Expressway Bridge (Guadalupe River)	
2a	Upstream of Alma Avenue on the East Bank near Elks Lodge	Water overtops upstream of Alma Avenue and floods Elks Lodge, as well as near the railroad (RxR) crossing, flowing northward along Lelong Street towards Alma Ave underpass.	12'-13'	14'-15'	17'-18'	West Alma Avenue Bridge (Guadalupe River)	


**APPENDIX B
Guadalupe River (continued)**

ID #	Index Location	Flooding Description	Flood Readiness Stage at Monitoring Location			Monitoring Locations	Photo
			50% Capacity	70% Capacity	100% Capacity		
2B	Water overtops upstream of Alma Avenue and floods Elks Lodge, as well as near the RxR crossing, flowing northward along Lelong Street towards Alma Ave underpass.	Water breaks out and spills towards away from the River.	12.5'-13.5'	14.5'-15.5'	18'-19'		
2c	Upstream of CA-87 on the West Bank	Water overbanks on the west side near Minnesota Avenue and Mills Court.	14'-15'	16'-17'	19'-20'		

**APPENDIX B
Guadalupe River (continued)**

ID #	Index Location	Flooding Description	Flood Readiness Stage at Monitoring Location			Monitoring Locations	Photo
			50% Capacity	70% Capacity	100% Capacity		
3a	Few hundred feet upstream of Nightingale Drive on the southwest bank	Water overtops the southwestern levee and spills into the residential neighborhood.	7'-8'	10'-11'	13'-14'	Nightingale Drive Culvert (Canoas Creek)	
3b	Nightingale Drive Culvert and southern levee downstream of Nightingale Drive	Water overtops the southern levee and the Nightingale Drive culvert and inundates the neighborhood.	7'-8'	10'-11'	14'-15'		
4a	Cherry Avenue	Water spills out just upstream of the Cherry Avenue Culvert, as well as along the levees upstream and downstream.	5'-6'	7'-8'	9'-10'	Cherry Avenue Culvert (Ross Creek)	
4b	Jarvis Avenue	Water spills out upstream of the Jarvis Avenue Culvert, as well as along the levees downstream and upstream.	5'-6'	7'-8'	9'-10'		

**APPENDIX B
Guadalupe River (continued)**

ID #	Index Location	Flooding Description	Flood Readiness Stage at Monitoring Location			Monitoring Locations	Photo
			50% Capacity	70% Capacity	100% Capacity		
5a	Upstream Branham Lane	Water spills out upstream Branham Lane on both sides.	14'-15'	17'-18'	20'-21'	Branham Lane Bridge (Guadalupe River)	
5b	East bank near Thousand Oaks Park	Low spot near Thousand Oaks Park becomes flooded, eventually spreading to the residential homes.	15.5'-16.5'	18'-19'	21.5'-22.5'		
5c	Upstream Capitol Expressway	Water spills out upstream of Capitol Expressway, flooding businesses along the road.	14'-15'	16.5'-17.5'	19.5'-20.5'		

Disclaimer: The flooding thresholds in this table are based on hydraulic modeling results calibrated with data collected during high flows and flood events. Hydraulic modeling results may be preliminary and should be used for general analysis purposes. The most current flood severity thresholds are at <https://alert.valleywater.org/map?p=map>. Information is accurate within the model limitations and assumptions/data used for model development. Use care while interpreting results.

**APPENDIX B
Guadalupe River (continued)**

**TABLE 2B
Almaden Expressway Gauge Flood Severity Thresholds**

Almaden Expressway Gauge Thresholds	Stage (ft)	Description
Action	8.0	Additional flow from Canoas Creek watershed or increased reservoir spills may bring river to flood stage
Minor Flooding	9.5	River begins to overtop upstream of Alma Avenue Bridge into the Elks Lodge, spilling north, as well as near the RxR on the east bank.
Moderate Flooding	11.5	River continues to overtop upstream of Alma Avenue Bridge into the Elks Lodge, spilling north along Lelong Street. Alma Avenue/CA87 viaduct is flooded. Creek overbanks west near Minnesota Avenue downstream of Alma Avenue. Properties south of the old UPRR alignment in the Northern Cross Neighborhood also at risk.
Historical High Water	11.73	January 1995
Major Flooding	15	Flooding continues to spill near Alma Avenue, flowing northward and crossing east under Willow Street and Alma Avenue viaducts, continuing to flow north. Overbanking occurs at Atlanta Avenue just upstream of CA-87. The Willow Glen Neighborhood bounded by Willow Street and Minnesota Avenue sees overland flooding. Overbanking occurs in various locations between Alma Avenue and Willow Glen Way. Potential flooding on Ross and Canoas creeks due to high backwater caused by Guadalupe River.
Major Flooding	17	Washington/Guadalupe, Tamien, and Alma/Almaden Neighborhoods east of CA-87 inundated from floodwaters traveling under street viaducts from the west. Widespread flooding in the eastern Willow Glen Neighborhood, as well as the Gardner and Atlanta/Bird neighborhoods. CA-87/I-280 interchange at risk from overland flow spilling onto the roadway. Possible overtopping of Guadalupe River near Capitol Expwy on the east side, flowing towards Pearl Ave. Additionally, possible overtopping near Thousand Oaks Park and upstream of Branham Lane, flowing along streets flooding businesses and the Erikson Neighborhood. If flood is sustained or increasing, car dealerships along Capitol Expressway may be inundated as well. Potential flooding on Ross and Canoas creeks due to high backwater caused by Guadalupe River.

Disclaimer: The flooding thresholds in this table are based on hydraulic modeling results calibrated with data collected during high flows and flood events. Hydraulic modeling results are estimates. Information is accurate within the model limitations and assumptions/data used for model development. This table is current as of the publishing of this document. The most current flood severity thresholds are at <https://alert.valleywater.org/map?p=map>. Use care while interpreting results.

**APPENDIX B
Guadalupe River (continued)**

**TABLE 3B
Temporary Flood Barrier Progressive Responsibilities/Activity**

Flood Barrier Deployment Level	Responsibility/Activity	Stakeholder
Prepare (Orange)	Prepare action plan for possible deployment if needed (may include actions the following actions).	MAC, EOC's, or DOC's
	Recommend establishing a Field Command and deploying Operations staff to monitor conditions along Guadalupe River south of Interstate 280 to Willow Glen Way and on Canoas Creek at Nightingale Drive.	MAC or Valley Water EOC/DOC
	Consider deploying FIT as necessary to assist Operations for monitoring Guadalupe River to gather information to determine deployment level.	City and Valley Water will coordinate.
	Alert Operational Area of preparation level of deployment and possibilities of road closures (I-280 off-ramp, Highway 87) and impact to light rail due to possible flooding and barrier deployment. Agencies to contact include: San José (EOC, OEM Duty Officer, Police, Fire), Santa Clara County EOC, California Highway Patrol, Caltrans, and Valley Transportation Authority. Contact information is located in Volume 1 as Attachment 1.	MAC, EOC Management/Operational Area
	Consider directing Field Command or Operations to implement the following tactical actions as appropriate: <ul style="list-style-type: none"> • Check sites for potential flood barrier placement and consider positioning materials to prepare for deployment, (Valley Water), • Position traffic controls to prepare for deployment (City), • Continue bridge obstruction clearing procedures (Valley Water), • Evaluate need for freeboard extension procedure (Valley Water), and • Prepare a site for delivery of sandbags for deployment shown in Figure 5B (City or Valley Water). 	MAC or Valley Water EOC/DOC Operations. Each Stakeholder is lead for their responsibility.
	Prepare materials for delivery near deployment area for Field Command to use (sandbags and sheeting needed for partial sealing of drainage inlets).	Valley Water
Mobilize (Red)	Prepare or update action plan to mobilize for deployment if appropriate (may include the following action).	MAC, EOC's, or DOC's
	Deploy FIT, Operations staff, or implement other detection methods to: <ul style="list-style-type: none"> • Observe/monitor riverbank/bridge freeboard in river reaches between I-280 and Willow Glen Way and Canoas Creek at Nightingale Drive and/or • When stage is nearing or exceeds 100% at visual gauge locations field observations will shift to floodplain monitoring to monitor overland flows progress towards I-280. 	Valley Water and City
	Provide information to determine extent of the condition to Field Command/EOC/DOC.	

**APPENDIX B
Guadalupe River (continued)**

Flood Barrier Deployment Level	Responsibility/Activity	Stakeholder
Mobilize (Red)	Advise Agencies of imminent flooding and plan to mobilize for deployment of barriers and possibilities of road closures (I-280 off-ramp, Highway 87) and impact to light rail due to possible flooding and barrier deployment. Agencies to contact include: San José (EOC, OEM Duty Officer, Police, Fire), Santa Clara County EOC, California Highway Patrol, Caltrans, and Valley Transportation Authority. Contact information is located in Volume 1 as Attachment 1.	MAC, EOC Management/Operational Area
	<p>Field Command may be directed to implement actions in preparation for deployment of barriers and traffic detours that could actions below.</p> <ul style="list-style-type: none"> • Position traffic control and detours. (City) • Position temporary water inflated flood barriers near Vine Street, Almaden Avenue and Almaden Boulevard (Figure 4B) in preparation of filling/installing. Each barrier is stored on-site in a container adjacent to each deployment location. The containers also store the necessary attachments, assembly tools, and sandbags. Keys and contact information are available from Valley Water – Watersheds Operations and Maintenance Division. • Partially sandbag storm drains flowing north in vicinity of temporary flood barriers (Duane Street near State Street - Figure 5B). (likely to be performed by City) • Continue bridge obstruction clearing procedure. (Valley Water) • Consider implementing freeboard extension procedure. (Valley Water) 	Valley Water and City Field Command
	Provide Police assistance if necessary for any evacuations of unhoused individuals located in flood areas or in areas needed for deployment.	City
	Prepare public messages and initiate public outreach to alert affected areas of potential flooding and deployment of barriers and traffic detours/road closures.	City with Valley Water support
	Notify Elected Officials of intent to mobilize for deployment as appropriate.	City and Valley Water is lead for their Elected Officials
Deploy (Purple)	Review and, if necessary, revise action plan for deployment of barriers.	MAC, EOC's, or DOC's
	Advise Agencies of planned deployment of barriers, implementation of traffic detours and possible road closures due to flooding that includes I-280 off-ramp, Highway 87 and light rail. Agencies to contact include: San José (EOC, OEM Duty Officer, Police, Fire), Santa Clara County EOC, California Highway Patrol, Caltrans, and Valley Transportation Authority. Contact information is located in Volume 1 as Attachment 1.	MAC, Valley Water & City EOC/DOC

**APPENDIX B
Guadalupe River (continued)**

Flood Barrier Deployment Level	Responsibility/Activity	Stakeholder
Deploy (Purple)	<p>If available, direct a FIT, other Operations staff, or other event detection method to monitor and report conditions at the following locations in the floodplain as determined necessary:</p> <ul style="list-style-type: none"> • Curtner Avenue at Highway 87, • Little Orchard Street between Curtner Avenue and Barnard Avenue, • <u>West Alma Avenue west of Monterey Street (Figure 1B) that is a location may trigger deployment,</u> • Alma Avenue at Highway 87/Caltrain underpass, • Willow Street at Highway 87/Caltrain underpass, and • <u>Lick Avenue near the Tamien Caltrain parking lot between Willow Street and Alma Avenue (Figure 1B) that is also a location may trigger deployment.</u> 	MAC, Valley Water & City EOC/DOC, or Valley Water Field Command
	<p>Direction to deploy barriers should be made 2-4 hours before major overland flow would reach the barrier locations. The following are sites that may be monitored to assist in making the decision for deployment:</p> <ol style="list-style-type: none"> 1. Floodwaters cross West Alma Avenue west of Monterey Street (Figure 1B), which is an indicator that overland flooding may reach the temporary barriers within 2 hours. 2. Floodwater flow east of the Caltrain tracks and near Lick Avenue (Figure 1B), which is an indicator that overland flooding may reach temporary barriers within 2 hours. 	MAC, Valley Water & City EOC/DOC, or Valley Water Field Command
	<p>If directed and determined appropriate, Field Command will implement traffic detours and install temporary barriers at locations shown in Figure 4B. and complete the blockage of storm drains. The following are the sequence of steps to take for deployment:</p> <ul style="list-style-type: none"> • Implement traffic detours (City), • Assure that storm drainage inlets have been partially blocked on Duane Street leaving an open area allowing flows from gutters to enter as long as possible (shown in Figure 5B and will likely be performed by staff from the City of San Jose), • Deploy water filled flood barriers K and L (Vine Street and Almaden Boulevard) keeping the closure at M (Almaden Avenue) open as long as possible (deploy approximately 1 hour before floodwaters reach the location) to allow for evacuation of residents (Valley Water), • Complete blockage of drainage inlets (Figure 5B) approximately 1 hour before overland flows arrive. (City) • Either deploy or visually monitor VTA light rail crossing and when imminent overtopping will occur (water reaches rails) deploy stop log closure structure at D (light rail crossing shown on Figure 4B), which should take approximately 30 minutes. (Valley Water and VTA) 	Valley Water, City & VTA

**APPENDIX B
Guadalupe River (continued)**

Flood Barrier Deployment Level	Responsibility/Activity	Stakeholder
Deploy (Purple)	Evacuate unhoused individuals located in flood areas or in areas needed for deployment as necessary.	City Police
	Review/revise public messages and continue public outreach to alert affected areas of potential flooding and deployment of barriers.	City with Valley Water support
	Notify Elected Officials of intent of deployment as appropriate.	City and Valley Water is lead for their Elected Officials.

APPENDIX B
Guadalupe River (continued)

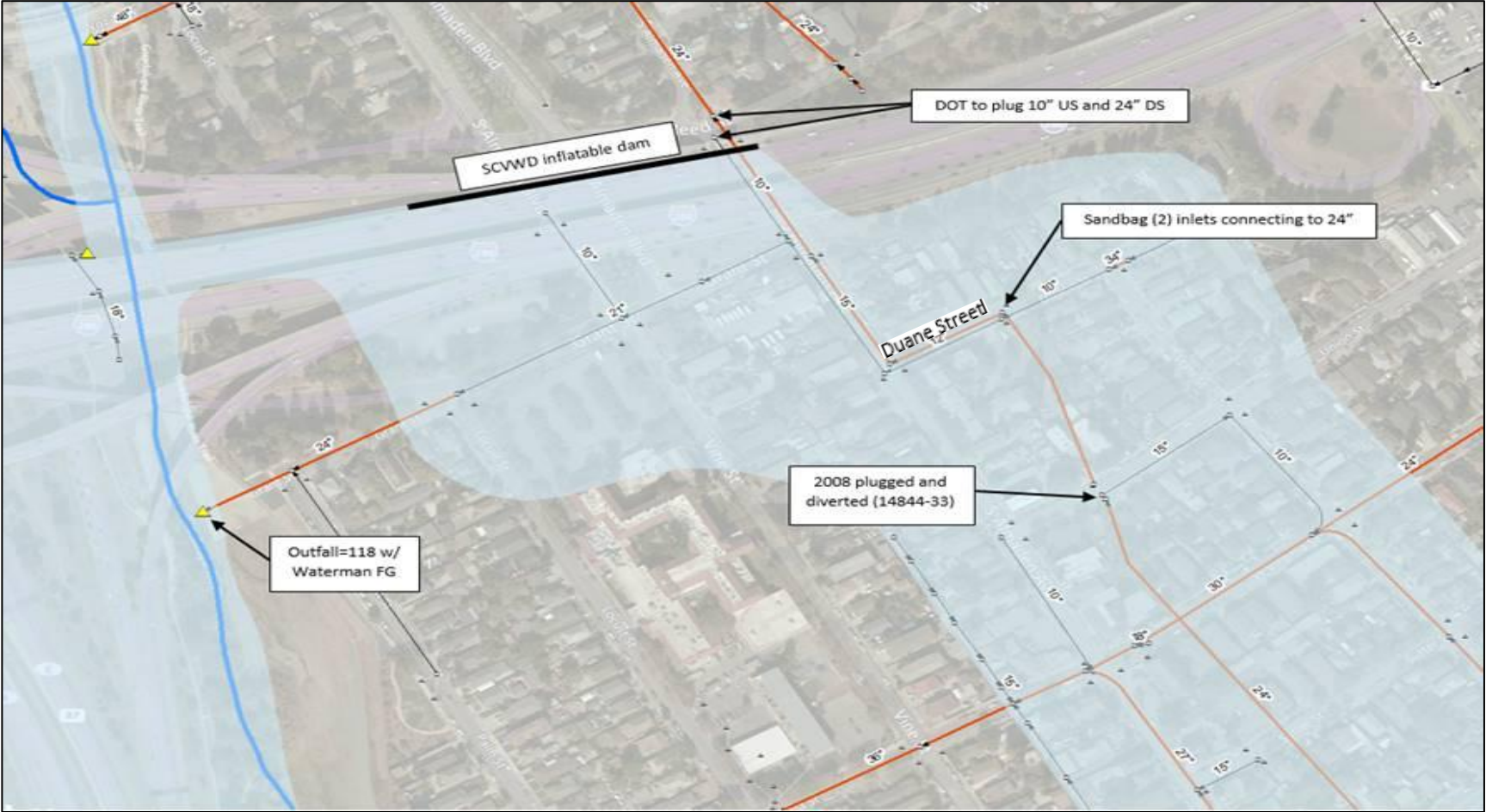


FIGURE 5B
Temporary Sandbagging of Storm Drain Inlets

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APPENDIX C

Canoas Creek

PURPOSE

This Appendix to the City, Valley Water and other Stakeholders Joint Emergency Action Plan (EAP) for Severe Storms and Flooding is meant to provide additional guidance specific to Canoas Creek. It will not duplicate information already in an entities Emergency Operations Plan (EOP) or the EAP, but will provide Canoas Creek specifics for:

1. Incident detection
2. Evaluation and readiness level classification
3. Notification and communications
4. Emergency actions

CANOAS CREEK DESCRIPTION

Canoas Creek begins at Cottle Road and flows 7.4 miles through South San José before it discharges into Guadalupe River just upstream of Almaden Expressway. Adjacent land uses are predominantly residential and commercial property. The creek is crossed by several major roadways that include: Highways 87 and 85, Capitol Expressway, Blossom Hill Road, and Santa Teresa Boulevard. The Canoas Creek watershed drains about 18.6 square miles of Santa Clara County and City of San José and is bounded on the south by the Almaden hills, on the west by Guadalupe River Watershed and on the east by Coyote Creek Watershed (Monterey Road). The channel was improved around 1970 and is generally trapezoidal with a 10'-12' wide concrete channel bottom and 1.5 to 1 earthen side slopes. There are levees from Guadalupe River to about 2,500 feet upstream near a farm bridge. From that point to the upstream limit of the creek at Cottle Road the top of bank is generally the same or slightly higher than adjacent ground.

CANOAS CREEK FLOOD THREATS

The major flood threat occurs near Nightingale Drive and is primarily caused by a backwater from high flows in Guadalupe River. The flooding begins by spilling south over the levee into a low residential area and possibly into Canoas Elementary School. As flow depth increases the spills occur over the north levee area and flow northward towards downtown San José east of Almaden Expressway and west of Monterey Road. The Light Rail station at Curtner Avenue floods and water flows under Highway 87 into the Mill Pond Neighborhood. Highway 87 downstream of Curtner Avenue is elevated, but 21 36" pipe culverts allow floodwaters to pass under the roadway into commercial and industrial areas that include San José Unified School District's Bus Yard and Maintenance Department. Floodwaters continue to flow through residential, commercial and industrial areas and end up at Interstate 280 near Almaden Road where temporary flood barriers are to be deployed to divert floodwaters back to Guadalupe River (see [Appendix B](#) regarding deployment of temporary flood barriers).

In addition, the creek may spill overbank upstream of culverts at Snell Avenue, Tillamook Drive, Blossom Avenue, and Calero Avenue. However, the major issue in the upstream area is that the creek does not have 100-year flood capacity and storm water is not able to enter the creek. This results in a shallow floodplain flowing along streets starting near Dunn Avenue to Highway 87. This floodplain varies in width and narrows at Blossom Hill Road, Highway 85, and Capitol

APPENDIX C Canoas Creek (continued)

Expressway. Waters in this shallow floodplain are not expected to enter structures, but rather to flow through the streets.

Flood events occurred in 1911, 1981, 1982, 1985 and 1995. The 1995 flooding overtopped the levees near Nightingale Drive and backflowed through the local drainage system into the adjacent low-lying neighborhood to the south flooding into residential structures. This event was the highest recorded event at the Canoas Creek flow gauge at Almaden Expressway since the creek was improved.

FLOOD EVENT DETECTION

There are several detection methods that are described in the EAP that include weather forecasts, hydrologic/hydraulic modeling, Automated Local Evaluation in Real Time (ALERT) stream/reservoir/precipitation gauge systems, and field observation of stage gauges and other areas of high flow.

Of these methods, the gauging and field observation methods specific to Canoas Creek are described below:

ALERT Gauge System

A listing of all ALERT gauges in the Guadalupe Watershed can be found on Valley Water's Surface Water Data Portal (<https://alert.valleywater.org/map?p=map>). These gauges provide data in near real-time at several locations in the watershed including on Canoas Creek.

The following is a summary of the current stream gauge program.

1. Annually sites will be prioritized for manual gauging and teams are assigned.
2. After every high flow event, the rule curves (depth versus discharge) are updated/calibrated. High flow calibration on Canoas Creek gauges was done after the 1995 event and again after the 2017 storm event.

Visual Observations

Visual observations can be critical to verify what is occurring because ALERT gauges are not always a reliable source of information and modeling information can vary from the actual condition. In addition, there are other known hot-spots that do not have ALERT gauges that may be visually checked during high flows. Supplementing with visual observations by viewing real-time images from WebCams (Valley Water Surface Water Data Portal – <http://alert.valleywater.org>), staff deployed in the field (i.e., Field Information Teams) and other field reporting is an important component to detection.

To allow additional information to be accurately gathered a visual stream stage monitoring location and WebCam (<https://alert.valleywater.org/map?p=map>) has been installed for observations. This is located at Nightingale Drive.

Valley Water operates Field Information Teams (FITs) that are assigned to specific locations during storms and high flow events to provide this valuable information. In addition, the City also deploys FIT teams in a coordinated way to assure that all critical locations are being monitored. Locations of FIT deployment by the City and Valley Water

APPENDIX C Canoas Creek (continued)

may overlap during storm and flood events. The EAP Multi-Agency Coordination (MAC) Group will coordinate this effort through the Planning/Intelligence Section so that resources are most effectively utilized and information is shared.

Valley Water Hot-Spots for possible FIT deployment are:

1. Visual stream gauges—checking for high water and rate of change
2. Known Flood Hot-Spots (Attachment 11 pages 79-81 of Joint Emergency Action Plan for Severe Storm and Flood Response in City of San José Volume 1)
3. Real-time Flooding—documenting flooding
4. Levees—check for stability
5. Bridge Piers—checking for debris blockages
6. Trash Racks—checking for debris blockages
7. Sandbag sites—checking for supply and access issues
8. Previously repaired or other project sites—checking for performance
9. Raw water facilities—dams and canals

CANOAS FLOOD READINESS LEVELS AND SEVERITY

Sometimes an event is a flash flood that occurs suddenly without much early notice. However, with weather forecasting and Guadalupe River and Canoas Creek modeling there is often an ability to estimate flood events before they occur. This is extremely valuable when preparing for necessary evacuations and road closures.

To provide this advanced notice, a readiness level will be used to provide an indicator of preparedness for a response and a level of potential severity for areas subject to flooding to assist the Agency's in planning and implementing appropriate actions. Because of the uncertainties of forecasting future conditions, a level of Watch will be used when flood stage is estimated about 24 to 48 hours or more in the future. If flooding is estimated within about 24 hours, the level will be elevated to Warning. In addition, an unexpected situation may occur during high flows that may result in a change in readiness level (Attachment 12 – Guidance Table for Evaluating Facility During High Flow and Determining Readiness Level of Joint Emergency Action Plan for Severe Storm and Flood Response in City of San José Volume 1).

APPENDIX C
Canoas Creek (continued)

PREPAREDNESS	<p>This is the base stage of readiness that will be the typical condition throughout most of the year. Preparedness is defined as:</p> <ul style="list-style-type: none"> • Flood stage (Minor Flooding or greater) is not estimated within the next 72 hours or • Measured stream depth is below 50% of flood stage.
MONITORING	<p>This condition is variable and requires more intense monitoring and a heightened level of alertness. A portion of the Emergency Management Organization (EMO) may be active to monitor for any developing flood concern. Monitoring is defined as:</p> <ul style="list-style-type: none"> • Flood stage may occur in 48 to 72 hours, or • Measured stream depth is at 50% to 70% of flood stage, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or near design stage within 24 hours.
WATCH	<p>Flood level or a serious flood threat is expected to occur. Multiple portions of the EMO may be activated at an appropriate level. Watch is defined as:</p> <ul style="list-style-type: none"> • Stream depth is estimated to reach flood stage or greater within 24 to 48 hours, or • Measured stream depths are at 70% to 100% of flood stage, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater than design stage within 6-12 hours.
WARNING	<p>This is a more urgent situation with flooding imminent or occurring. The EMO is more completely active. Warning is defined as:</p> <ul style="list-style-type: none"> • Flood stage or greater is occurring or is estimated to occur within 24 hours, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater within minutes/hours or is occurring.
<p><u>Note:</u> Flood stage is the depth of water at which a stream or facility begins flooding (see Glossary of Terms).</p>	

When the level is at a Watch or Warning, there is an expectation that flooding will occur or is occurring at some locations. The severity of the situation at specific locations is determined by the flood stage. The areas subject to flooding for different stream stages are estimated utilizing hydraulic models and flood maps.

Flood severity categories are defined by the NWS as:

Action	An established gauge height which when reached by a rising stream, lake, or reservoir represents the level where action is taken in preparation for possible significant hydrologic activity.
Minor Flooding	Minimal or no property damage, but possibly some public threat (e.g., inundation of roads).
Moderate Flooding	Some inundation of structures and roads near stream, evacuations of people and/or transfer of property to higher elevations.
Major Flooding	Extensive inundation of structures and roads, significant evacuations of people and/or transfer of property to higher elevations.

APPENDIX C
Canoas Creek (continued)

A flood inundation map of Canoas Creek is shown in [Figure 1C](#) and the associated Flood Thresholds [Table 1C](#) on the following page. The map is the Federal Emergency Management Agency (FEMA) 1 percent flood map. This map is based on the best available information and modeling when it was created and should be considered approximate due to the difficulty in estimating an actual event and the changing conditions of the creek.

[Table 2C](#) is a flood severity table for the Almaden Expressway Gauge that is used to estimate areas that will be subject to flooding. Because there is very little notice for flooding based on this gauge, flood conditions will often utilize predictive methods based on weather forecast and watershed conditions.

These tables along with the actual or modeled data would allow Valley Water or MAC to establish readiness levels for specific areas subject to flooding. Mapping associated with this table will be provided to Agency Stakeholders. This information will be made available for notifications and will be coordinated with the National Weather Service to be consistent in the dissemination of readiness level and severity information. The most current information regarding flood severity and flood thresholds is available at <https://alert.valleywater.org/map?p=map>.

Notifications and Activity/Actions: Notifications and actions are described in the Joint EAP which describes readiness level and severity, notifications and activity/actions to be taken by both the City, Valley Water and other stakeholders. The level of activity will be guided by the best information available to the Agency Subject Matter Experts (SMEs) and Agency Coordinators (ACs). The level of activity may mirror those activities of the individual jurisdictional Emergency Operations Centers (EOCs). As weather conditions merit and monitoring take place, the SMEs and ACs may be in their home offices or their jurisdiction’s EOC, if activated. The “call to action” may be a series of phone calls among the SMEs and ACs to determine the best approach to coordination.


INFRASTRUCTURE AT RISK

There are no Federal Emergency Management Agency (FEMA) defined critical facilities located in the floodplain, however, there are other important infrastructure where people, property, and important facilities may be at risk. Based on intelligence gathered during the storm event, the MAC will determine the risk and provide notifications as appropriate. The facilities below are within the area where people, property, and infrastructure may be at risk:

FACILITY TYPE	NAME	ADDRESS	PHONE
School	Canoas Elementary School	880 Wren Drive San José, CA 95125	(408) 535-6391
	Santa Teresa High School	6150 Snell Avenue San José, CA 95123	(408) 347-6200
Utilities	Light Rail Stations at Curtner Avenue	2348 Canoas Garden Avenue San José, CA 95125	(408) 321-2300
Other	San José Unified Bus Yard and Maintenance Department	2230 Unified Way San José, CA 95125	(408) 535-6330

**APPENDIX C
Canoas Creek (continued)**

**TABLE 1C
Canoas Creek Flood On-Site Monitoring Thresholds**

ID #	Index Location	Flooding Description	Flood Readiness Stage at Monitoring Location			Monitoring Locations	Photo
			50% Capacity	70% Capacity	100% Capacity		
3a	Few hundred feet upstream of Nightingale Drive on the southwest bank	Water overtops the southwestern levee and spills into the residential neighborhood.	7'-8'	10'-11'	13'-14'	Nightingale Drive Culvert (Canoas Creek)	
3b	Nightingale Drive Culvert and southern levee downstream of Nightingale Drive	Water overtops the southern levee and the Nightingale Drive culvert and inundates the neighborhood.	7'-8'	10'-11'	14'-15'		
5c	Upstream Capitol Expressway	Water spills out upstream of Capitol Expressway, flooding businesses along the road.	15'-16'	17'-18'	19'-20'		

Disclaimer: The flooding thresholds in this table are based on hydraulic modeling results calibrated with data collected during high flows and flood events. Hydraulic modeling results may be preliminary and should be used for general analysis purposes. Information is accurate within the model limitations and assumptions/data used for model development. This table is current as of the publishing of this document. The most current flood severity thresholds are at <https://alert.valleywater.org/map?p=map>. Use care while interpreting results.

**APPENDIX C
Canoas Creek (continued)**

**TABLE 2C
Canoas Creek at Almaden Expressway Gauge Flood Severity Thresholds (NWS Model)**

Almaden Expressway Gauge Thresholds	Stage (ft)	Description
Action	9.5	Calero Avenue and Blossom Hill Road could flood from high flow and/or debris buildup. Street flooding is possible. Canoas Creek begins experience a backwater condition when the Guadalupe River is at a stage of about 7' at the Almaden Expressway stream gauge.
Minor Flooding	13.5	Overtopping occurs upstream of Nightingale Drive.
Historical High Water	13.8	January 1995
Moderate Flooding	15	Significant flooding in the Canoas Garden Neighborhood near Nightingale Drive occurs. Waters start flowing north towards Curtner Avenue and Almaden Expressway. Canoas Elementary School and the Mill Pond Neighborhood are at risk.
Major Flooding	16	Entire Canoas Gardens Neighborhood impacting Canoas Elementary School. Floodwaters flow northward and inundate the Mill Pond Neighborhood and may impact the Light Rail Station at Curtner Avenue. Flood areas are primarily west of Highway 87, East of Almaden Expressway and south of Curtner Avenue, however, some water may continue northward across Curtner Avenue.
Major Flooding	17	Major flooding occurs as floodwaters continue north of Curtner Avenue towards the Highway 87 and Interstate 280 interchange. Almaden Terrace Apartments, Guadalupe Almaden Neighborhood, and Northern Cross Neighborhood are inundated. Water may cross east of Caltrain Railroad Tracks that are just east of Highway 87 and continue through industrial and commercial areas bounded by Curtner Avenue and Barnard Avenue. Floodwaters flow towards Monterey Road and if flooding continues the floodwater will reach 1 st Street and require temporary flood barriers to be deployed near Interstate 280 to protect Downtown San José (Appendix B).

Disclaimer: The flooding thresholds in this table are based on hydraulic modeling results calibrated with data collected during high flows and flood events. Hydraulic modeling results are estimates. Information is accurate within the model limitations and assumptions/data used for model development. This table is current as of the publishing of this document. The most current flood severity thresholds are at <https://alert.valleywater.org/map?p=map>. Use care while interpreting results.

APPENDIX D

Ross Creek

PURPOSE

This Appendix to the City, Valley Water and other Stakeholders Joint Emergency Action Plan (EAP) for Severe Storms and Flooding is meant to provide additional guidance specific to Ross Creek. It will not duplicate information already in an EOP or the EAP, but will provide Ross Creek specifics for:

1. Incident detection
2. Evaluation and readiness level classification
3. Notification and communications
4. Emergency actions

ROSS CREEK DESCRIPTION

Ross Creek begins in the Town of Los Gatos upstream of Blossom Hill Road and discharges about 6.1 miles later into the Guadalupe River at Almaden Expressway about 1,000 feet north of Branham Lane in the City of San José. The watershed is part of the Guadalupe River Watershed and drains about 10 square miles of primarily medium density residential areas in the City of San José and Town of Los Gatos and is bounded on the south by the Guadalupe Creek, and on the west and north by Los Gatos Creek.

Ross Creek is predominantly a constructed trapezoidal earth channel with 8 ft to 12 ft bottom width and side slopes ranging from 1.5:1 to nearly vertical due to erosion. Maintenance roads of about 17 ft in width are present along most of the creek. There are culverts at road crossings with the major road crossings including Blossom Hill Road, Los Gatos Almaden Road, Leigh Avenue, Highway 85, Camden Avenue, Meridian Avenue, Cherry Avenue and Almaden Expressway.

ROSS CREEK FLOOD THREATS

Ross Creek is a very flashy drainage area and depth of flow can change quickly. It can also be influenced by high water in Guadalupe River and may flood due to that influence. The flood prone areas are generally located upstream of culverts at Jarvis Avenue and Cherry Avenue due to constriction of the flows. These areas flood adjacent residential areas. However, the most significant flooding is upstream of Briarglen Drive between Jarvis Avenue and Almaden Expressway that can be exacerbated by a backwater from high flows in Guadalupe River. Flooding in this area causes minor impacts to a residential area south of the creek and major impacts to the north. The floodplain to the north flows west of Almaden Expressway and east of Cherry Avenue up to Curtner and then east of Lincoln Avenue north of Pine Street. This flooding continues through Willow Glen to Interstate 280 west of Highway 87 and can flood three elementary schools and a community center. Flooding can also impact the Interstate 280 and Highway 87 interchange. [Figure 1D](#) shows the Federal Emergency Management Agency (FEMA) 100-year (1 percent) floodplain for Ross Creek.

APPENDIX D Ross Creek (continued)

FLOOD EVENT DETECTION

The flood event detection methods include weather forecasts, hydrologic/hydraulic modeling, Automated Local Evaluation in Real Time (ALERT) stream/reservoir/precipitation gauge systems, and field observation of stage gauges and other areas of high flow.

Of these methods, the gauging and field observation methods specific to Ross Creek are described below:

ALERT Gauge System

A listing of all ALERT gauges in the Guadalupe River Watershed can be found at <http://alert.valleywater.org>. These gauges provide data in near real-time at several locations in the watershed. Upstream gauges will provide valuable information for flood events occurring downstream and may give hours' notice to take action. However, the ALERT gauges on Ross Creek at Cherry Avenue and on Guadalupe River at Almaden Expressway will be the primary gauges used for determining the flood condition on Ross Creek.

The following is a summary of the current stream gauge program:

1. Annually sites will be prioritized for manual gauging and teams are assigned.
2. After every high flow event, the rule curves (depth versus discharge) are updated/calibrated. High flow calibration on Guadalupe Watershed gauges was done after the 1995 event and some were completed after the 2017 winter high flows.

Visual Observations

Visual observations can be critical to verify what is occurring because ALERT gauges are not always a reliable source of information and modeling information can vary from the actual condition. In addition, there are other known hot-spots and facilities that should be visually checked during high flows. Supplementing with visual observations by viewing real-time images from WebCams (Valley Water Surface Water Data Portal – <http://alert.valleywater.org>), staff deployed in the field (i.e., Field Information Teams) and other field reporting is an important component to detection.

Valley Water operates Field Information Teams (FITs) that are assigned to specific locations during storms and high flow events to provide this valuable information. In addition, the City also deploys FIT teams in a coordinated way to assure that all critical locations are being monitored. Locations of FIT deployment by the City and Valley Water may overlap during storm and flood events. The EAP Multi-Agency Coordination (MAC) Group and/or the jurisdictions EOC will coordinate this effort through the Planning/Intelligence Section so that resources are most effectively utilized and information is shared.

APPENDIX D Ross Creek (continued)

Valley Water Hot-Spots for possible FIT deployment are:

1. Visual stream gauges—checking for high water and rate of change
2. Known Flood Hot-Spots (Attachment 11 pages 82-86 of Joint Emergency Action Plan for Severe Storm and Flood Response in City of San José Volume 1)
3. Real-time Flooding—documenting flooding
4. Bridge Piers—checking for debris blockages
5. Trash Racks—checking for debris blockages
6. Levees downstream of Highway 101—check for stability
7. Sandbag sites—checking for supply and access issues
8. Previously repaired or other project sites—checking for performance
9. Raw water facilities—dams and canals

To aid in accurately gathering information, a visual stream stage monitoring location has been installed at Cherry Avenue on Ross Creek and a Cherry Avenue and Meridian Avenue ALERT WebCam can be viewed at <https://alert.valleywater.org/map?p=map>.

ROSS CREEK FLOOD READINESS LEVELS AND SEVERITY

Sometimes an event is a flash flood that occurs suddenly without much early notice. However, with weather forecasting and computer modeling of the watersheds there is often an ability to estimate flood events before they occur. This is extremely valuable when preparing for necessary evacuations and road closures.

To provide this advanced notice, a readiness level will be used to provide an indicator of preparedness for a response and a level of potential severity for areas subject to flooding to assist the Agency's in planning and implementing appropriate actions. Due to uncertainties of forecasting future conditions, a level of Watch will be used when flood stage is estimated about 24 to 48 hours or more in the future. If flooding is estimated within about 24 hours, the level will be elevated to Warning. In addition, an unexpected situation may occur during high flows that may result in a change in readiness level (Attachment 12 – Guidance Table for Evaluating Facility During High Flow and Determining Readiness Level of Joint Emergency Action Plan for Severe Storm and Flood Response in City of San José Volume 1).

APPENDIX D
Ross Creek (continued)

PREPAREDNESS	<p>This is the base stage of readiness that will be the typical condition throughout most of the year. Preparedness is defined as:</p> <ul style="list-style-type: none"> • Flood stage (Minor Flooding or greater) is not estimated within the next 72 hours or • Measured stream depth is below 50% of flood stage.
MONITORING	<p>This condition is variable and requires more intense monitoring and a heightened level of alertness. A portion of the Emergency Management Organization (EMO) may be active to monitor for any developing flood concern. Monitoring is defined as:</p> <ul style="list-style-type: none"> • Flood stage may occur in 48 to 72 hours, or • Measured stream depth is at 50% to 70% of flood stage, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or near design stage within 24 hours.
WATCH	<p>Flood level or a serious flood threat is expected to occur. Multiple portions of the EMO may be activated at an appropriate level. Watch is defined as:</p> <ul style="list-style-type: none"> • Stream depth is estimated to reach flood stage or greater within 24 to 48 hours, or • Measured stream depths are at 70% to 100% of flood stage, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater than design stage within 6-12 hours.
WARNING	<p>This is a more urgent situation with flooding imminent or occurring. The EMO is more completely active. Warning is defined as:</p> <ul style="list-style-type: none"> • Flood stage or greater is occurring or is estimated to occur within 24 hours, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater within minutes/hours or is occurring.
<p><u>Note:</u> Flood stage is the depth of water at which a stream or facility begins flooding (see Glossary of Terms).</p>	

When the level is at a Watch or Warning, there is an expectation that flooding will occur or is occurring at some locations. The severity of the situation at specific locations is determined by the flood stage. The areas subject to flooding for different stream stages are estimated utilizing hydraulic models, the FEMA flood map, and flood maps from the 1995 floods.

Flood severity categories are defined by the NWS as:

Action	An established gauge height which when reached by a rising stream, lake, or reservoir represents the level where action is taken in preparation for possible significant hydrologic activity.
Minor Flooding	Minimal or no property damage, but possibly some public threat (e.g., inundation of roads).
Moderate Flooding	Some inundation of structures and roads near stream, evacuations of people and/or transfer of property to higher elevations.
Major Flooding	Extensive inundation of structures and roads, significant evacuations of people and/or transfer of property to higher elevations.

**APPENDIX D
Ross Creek (continued)**

A 100-year (1 percent) flood inundation map of Ross Creek is shown in [Figure 1D](#) and the associated Flood Thresholds in [Table 1D](#). The map is the Federal Emergency Management Agency (FEMA) 1 percent flood map. This map is based on the best available information and modeling when it was created and should be considered approximate due to the difficulty in estimating an actual event and the changing conditions of the creek.

[Table 2D](#) is a flood severity table for the Ross Creek at Cherry Avenue Gauge that is used to estimate areas that will be subject to flooding. Because there is very little notice for flooding based on this gauge, flood conditions will often utilize predictive methods based on weather forecast and watershed conditions. In addition, the Guadalupe River gauge at Almaden Expressway is used to predict flooding. Refer to [Appendix B](#) of the EAP (Joint Emergency Action Plan for Severe Storm and Flood Response in City of San José Volume 1) for flood severity based on that gauge.

These tables along with the actual or modeled data would allow Valley Water or MAC to establish readiness levels for specific areas subject to flooding. Mapping associated with this table will be provided to Agency Stakeholders. This information will be made available for notifications and will be coordinated with the National Weather Service to be consistent in the dissemination of readiness level and severity information. The most current information regarding flood severity and flood thresholds is available at <https://alert.valleywater.org/map?p=map>.

NOTIFICATIONS AND ACTIVITY/ACTIONS

Notifications and actions are described in the Joint EAP which describes readiness level and severity, notifications and activity/actions to be taken by both the City, Valley Water and other stakeholders. The level of activity will be guided by the best information available to the Agency Subject Matter Experts (SMEs) and Agency Coordinators (ACs). The level of activity may mirror those activities of the individual jurisdictional Emergency Operations Centers (EOCs). As weather conditions merit and monitoring take place, the SMEs and ACs may be in their home offices or their jurisdiction’s EOC, if activated. The “call to action” may be a series of phone calls among the SMEs and ACs to determine the best approach to coordination.


INFRASTRUCTURE AT RISK

There are no Federal Emergency Management Agency (FEMA) defined critical facilities located in the floodplain, however, there are other important infrastructure where people, property, and important facilities may be at risk. Based on intelligence gathered during the storm event, the MAC will determine the risk and provide notifications as appropriate. The facilities below are within the area where people, property, and infrastructure may be at risk:

FACILITY TYPE	NAME	ADDRESS	PHONE
School	Hacienda Elementary School	1290 Kimberly Drive San José, CA 95118	(408) 535-6000
	Schallenberger Elementary School	1280 Koch Lane San José, CA 95125	(408) 535-6000
	Galarza Elementary School	1610 Bird Avenue San José, CA 95125	(408) 535-6000
Other	Willow Glen Community and Senior Center	2175 Lincoln Avenue San José, CA 95125	(408) 448-6400

**APPENDIX D
Ross Creek (continued)**

**TABLE 1D
Ross Creek Flood On-Site Monitoring Thresholds**

ID #	Index Location	Flooding Description	Flood Readiness Stage at Monitoring Location			Monitoring Locations	Photo
			50% Capacity	70% Capacity	100% Capacity		
4a	Cherry Avenue	Water spills out just upstream of the Cherry Avenue Culvert, as well as along the levees upstream and downstream.	5'-6'	7'-8'	9'-10'	Cherry Avenue Culvert (Ross Creek)	
4b	Jarvis Avenue	Water spills out upstream of the Jarvis Avenue Culvert, as well as along the levees downstream and upstream.	5'-6'	7'-8'	9'-10'		

Disclaimer: The flooding thresholds in this table are based on hydraulic modeling results calibrated with data collected during high flows and flood events. Hydraulic modeling results may be preliminary and should be used for general analysis purposes. The most current flood severity thresholds are at <https://alert.valleywater.org/map?p=map>. Information is accurate within the model limitations and assumptions/data used for model development. Use care while interpreting results.

**APPENDIX D
Ross Creek (continued)**

**TABLE 2D
Cherry Avenue Gauge Flood Severity Thresholds (NWS Model)**

Cherry Avenue Gauge Thresholds	Stage (ft)	Description
Action	7.5	Creek is flashy and can be quickly influenced by changes in localized rainfall and/or high flows in Guadalupe River.
Minor Flooding	10	Water begins to overtop Cherry Avenue Culvert onto Montmorency Drive to the south and at Jarvis Avenue Culvert staying in the adjacent area. Storm drains start backing up into low-lying neighborhoods causing local flooding of streets.
Historical High Water	10.9	May 1996
Moderate Flooding	11	Water begins spilling to north between Jarvis Avenue and Almaden Expressway and sheet flowing north through the neighborhood towards Hillsdale Avenue. Hacienda Elementary School may experience flooding.
Major Flooding	12'+	This is the stage of about the 100-year flood event. Significant flooding occurs between Jarvis Avenue and Almaden Expressway south of Hillsdale Avenue and backwater from Guadalupe River may contribute to additional flood duration. Depending on the duration of overtopping, waters may move north past Hillsdale Avenue flowing east of Cherry Avenue up to Curtner Avenue and then continuing east of Lincoln Avenue north of Pine Street towards the Interstate 280 and Highway 87 interchange. This flooding will likely impact Willow Glen Community Center and Hacienda, Schallenberger, and Galarza Elementary Schools.
<p>Disclaimer: The flooding thresholds in this table are based on hydraulic modeling results calibrated with data collected during high flows and flood events. Hydraulic modeling results are estimates. Information is accurate within the model limitations and assumptions/data used for model development. This table is current as of the publishing of this document. The most current flood severity thresholds are at https://alert.valleywater.org/map?p=map. Use care while interpreting results.</p>		

APPENDIX E

Lower Silver Creek and Lake Cunningham

PURPOSE

This Appendix to the Joint Emergency Action Plan (EAP) for Severe Storms and Flooding in the City of San José is meant to provide additional guidance specific to Lower Silver Creek and the associated detention function of Lake Cunningham. It will not duplicate information already in an EOP or the EAP, but will provide Lower Silver Creek and Lake Cunningham specifics for:

1. Incident detection
2. Evaluation and readiness level classification
3. Notification and communications
4. Emergency actions

LOWER SILVER CREEK AND LAKE CUNNINGHAM DESCRIPTION

The Lower Silver Creek Watershed is in the eastern portion of the City of San José (City) and in the unincorporated area of the County of Santa Clara and is bounded on the east by the Diablo Range and on the west by the Coyote Watershed. The upper regions of the watershed are located in steep foothills while the lower region is gently sloping. The lower and flatter area, which constitutes about one-third of the watershed and is the location of the six-mile long Lower Silver Creek, is highly urbanized. The watershed is approximately five miles wide at its downstream end and gradually narrows to a width of about one mile at its upstream end and covers an area of about 43 square miles (27,700 acres). There are several tributaries in the watershed with the largest being Thompson Creek, with a watershed of about 20.9 square miles (13,400 acres).

Santa Clara Valley Water District (Valley Water) completed improvements on Lower Silver Creek and Lake Cunningham to provide 100-year (1%) protection for flooding from Lower Silver Creek between its confluence with Coyote Creek to just upstream of Lake Cunningham. The flood protection improvements included channel widening, concrete u-frame channels, bridge improvements, construction of levees and floodwalls, and improvements of the detention facility at Lake Cunningham Park. Other improvements made were: incorporating fish passage features, planting natural vegetation to improve habitat, sediment transport features to improve maintenance to restore flow capacity, improving access for maintenance and inspections, and armoring areas of the channel to reduce potential for erosion.

Valley Water owns fee-title right of way on nearly the entire length of Lower Silver Creek. The exceptions are where it owns easement at bridges and at the City of San José's Plata Arroyo Park and Lake Cunningham Park. [Figure 1E](#) shows the creek location and project reaches and following that is a reach-by-reach description. It should be noted that the sky in the pictures for Reach 1-7 is yellow due to major California wildfires and hazardous air quality on September 9-11, 2020.

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

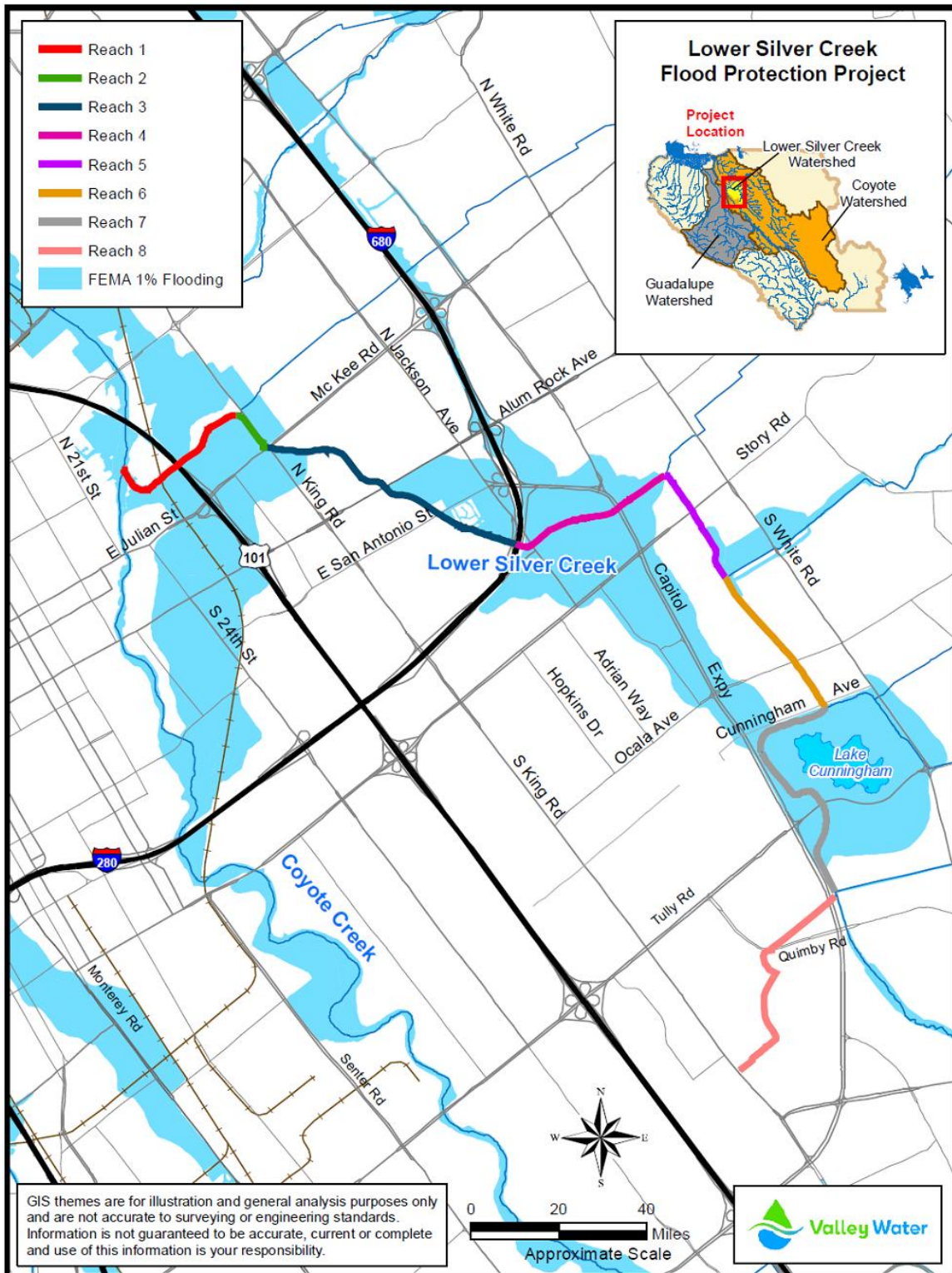


FIGURE 1E
Lower Silver Creek & Lake Cunningham Reach Map and FEMA Flooding

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

Reach 1 – Coyote Creek to Miguelita Creek

This 4,000-foot long reach consists of a combination of earth channel with a depressed maintenance road on the north side of a low-flow channel, vegetated gabion side slopes and over 1,000 feet of 2-foot to 3-foot high floodwall. The bottom of the channel is earth and generally has a 3-foot deep sediment transport channel, riparian vegetation and a vegetated bench. The channel invert supports emergent marsh and native riparian trees and shrubs have been planted on the top of both banks. There are grade control structures installed near the Coyote Creek confluence and Wooster Avenue Bridge. There is a channel constriction at the old Union Pacific Railroad (UPRR) bridge crossing, which has been removed, between Coyote Creek and Highway 101 just upstream of the Wooster Avenue Bridge.



Looking upstream from Wooster towards the old UPRR crossing and Hwy 101



Looking upstream from Highway 101

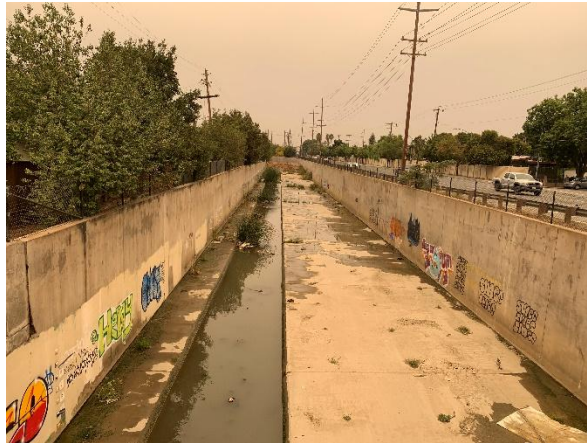


Looking downstream from the upstream end of Reach 1

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

Reach 2 – Miguelita Creek to McKee Road

This reach runs about 1,200 feet adjacent to King Road and is an architecturally treated rectangular concrete channel with a low flow channel. Sediment expected to accumulate in the area will need to be periodically removed. Native trees and vines are planted on top of the south and north banks. Near the intersection of King Road and McKee Road, the channel transitions to a concrete box culvert. There is a trash boom installed at the downstream end of the reach.



Looking downstream from near McKee Road

Reach 3 – McKee Road to Interstate 680

The channel transitions from the existing box culvert beneath the King and McKee Road intersection into an earth channel with emergent marsh vegetation for about 1,200 feet upstream. A 4-foot high floodwall protects adjacent residential areas to the north and a combination of levees and overland flow in Plata Arroyo Park are on the opposite side. The north bank includes a maintenance road with an adjacent grass covered floodplain. A pedestrian bridge provides access to the park from the residential areas across the creek.



Looking downstream at the McKee Road culvert

APPENDIX E Lower Silver Creek and Lake Cunningham (continued)

Upstream of Plata Arroyo Park the widened earthen channel transitions to a concrete channel for about 2,200 feet to Alum Rock Avenue. The concrete section of channel includes a low-flow channel to allow continuity of base flows. Native trees, shrubs, and vines have been planted along parts of the top of bank through this area.



Looking upstream along Checkers Drive towards Alum Rock Avenue

From Alum Rock Avenue upstream about 1,700 feet to San Antonio Road the channel is earthen with some bank protection and a depressed maintenance road on the north side. Sunset Avenue and a pedestrian bridge crosses the channel in this area. There is a stream gauge just downstream of San Antonio Road bridge.



Looking upstream from Sunset Avenue



Looking downstream of San Antonio Road (stream gauge on right)

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

From San Antonio Road upstream for about 2,200 feet to Interstate 680 (I-680) the channel is generally an earthen trapezoidal with vegetation on the south bank and a top of bank maintenance road on the north bank that ends at I-680. There is a pedestrian bridge located at Kammerer Avenue and a maintenance road turn-around at I-680. Adjacent land-use on the north side is residential with the south side including; Lee Mathson Middle School, Mayfair Community Center and Our Lady of Guadalupe Church.



Looking upstream from San Antonio Road



Looking upstream from Kammerer Pedestrian bridge towards I-680

Reach 4 – I-680 to North Babb Creek

The approximately 4,400 foot long reach consists of a 240-foot U-frame concrete channel with a sediment trap and low flow channel from I-680 to South Jackson Avenue crossing, which transitions to a widened earthen channel with a vegetated bench on the south side and a 20 foot wide aggregate maintenance road 2.5 feet above the sediment transport channel bottom on the remainder of the channel section. Capitol Expressway crosses the creek upstream of Jackson Avenue and there is a pedestrian bridge connecting Dobern Avenue and Bambi Lane. Flood walls of approximately 2 to 4 ft above grade are required for this entire section with a gradual height decline further upstream.



Looking downstream of the Dobern Ave-Bambi Ln pedestrian bridge

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

Reaches 5 & 6 – North Babb Creek to Lake Cunningham (Cunningham Avenue)

These reaches extend about 7,400 feet from the end of Reach 4 at North Babb Creek to Lake Cunningham (Cunningham Avenue). The channel throughout this area has an earthen bottom a vegetated west bank and an east bank that contains a 20-foot wide aggregate base maintenance road 2.5 feet above the earthen channel bottom. Rock protects the toe of both banks of the earthen channel bottom and floodwalls extend along both banks up to 5 feet in height. A full-span pedestrian bridge is located at the downstream end of the reach and there are road crossings at Story Road, Murtha Drive, Moss Point Drive and Ocala Avenue. Adjacent land uses are a combination of residential, commercial and educational (Alum Rock Middle School and Adelante Academy).



Looking upstream from Story Road



Looking upstream from Ocala Avenue

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

Reach 7 – Lake Cunningham Park to Thompson Creek

Lower Silver Creek flows about 7,200 feet around the west side of Lake Cunningham Park upstream and crosses under Tully Road until it meets Thompson Creek. There are levees along portions of the creek to protect the residential areas to the north while allowing high flows to discharge into the Lake Cunningham Park. Lake Cunningham Park functions as a detention facility starting at about a 5-year flow event (stage is 4.4' at the Thompson Creek Quimby Road ALERT gauge) to reduce 1% peak flows downstream of Cunningham Avenue to about 2,700 cubic feet per second (cfs). A floodwall, levees and outlet control structure of the culvert at Cunningham Avenue have been designed along with the lower improvements to provide 100-year (1%) flood protection for downstream properties. Lower Silver Creek is a widened earth channel upstream of Tully Road. Valley Water owns easement in Lake Cunningham Park and fee title upstream.



Looking west down floodwall and levee at Cunningham Avenue (culvert on right)



Looking south and east at Cunningham Avenue headwall and floodwall



Looking upstream of Tully Road

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

Reach 8 – Thompson Creek to King Road

Lower Silver Creek flows in an earthen trapezoidal channel for about 1,065 feet from King Road to the City’s Meadowfair Park. At Meadowfair Park the creek flows through a trash rack and into a reinforced concrete pipe for about 5,000 feet until it discharges into an open earthen channel at the confluence with Thompson Creek near intersection of Capitol Expressway and Eastridge. Valley Water owns fee-title right of way in the open channel section and easement for much of the pipe alignment.



Beginning of Reach 8 at Confluence with Thompson



Upstream end of Reinforced Concrete Pipe at Mayfield Park

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

LOWER SILVER CREEK FLOOD THREATS

Lower Silver Creek is a very flashy drainage area and depth of flow can change quickly. Reach 1 can also be influenced by high water in Coyote Creek and may experience high water levels due to that influence. The areas prone to flooding from Lower Silver Creek, shown in [Figure 1E](#), have all been provided with 100-year (1%) flood protection primarily by construction of floodwalls, levees, enlarging the channel section, and improving upstream detention. Valley Water and the City are requesting a Letter of Map Revision to Federal Emergency Management Agency (FEMA) to remove the 1% flood areas from the map. However, flooding can still occur during larger storm events and unexpected channel conditions (e.g., floodwall failure).

Because flooding is still possible due to higher than 1% flows or other unexpected events (Attachment 12 of Joint Emergency Action Plan for Severe Storm and Flood Response in City of San José Volume 1), the existing FEMA 1% flood inundation map of Lower Silver Creek ([Figure 1E](#)) will provide one way to identify areas that could be at flood threat. In addition, flood areas for 6 potential levee failure scenarios at the Lake Cunningham upstream detention facility have been mapped. [Figure 2E](#) shows three smaller levee failure scenarios and [Figures 3E, 4E](#) and [5E](#) show the flooding due to those failures. [Figure 6E](#) shows three additional larger levee failure scenarios, where entire levee reaches were failed, with the flooding due to those breaches shown on [Figures 7E, 8E](#) and [9E](#). These maps give the City some tools to help determine evacuation zones, should a levee breach occur.



FIGURE 2E
Modeled Levee Failure Locations at Lake Cunningham Detention Facility

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

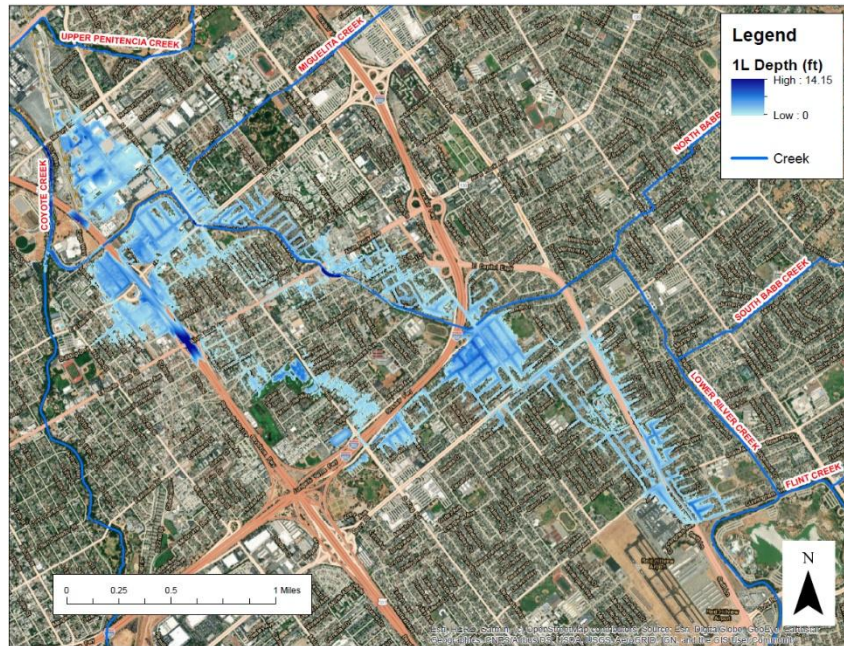


FIGURE 3E
Flooding due to Potential Levee Failure Location 1L at Lake Cunningham

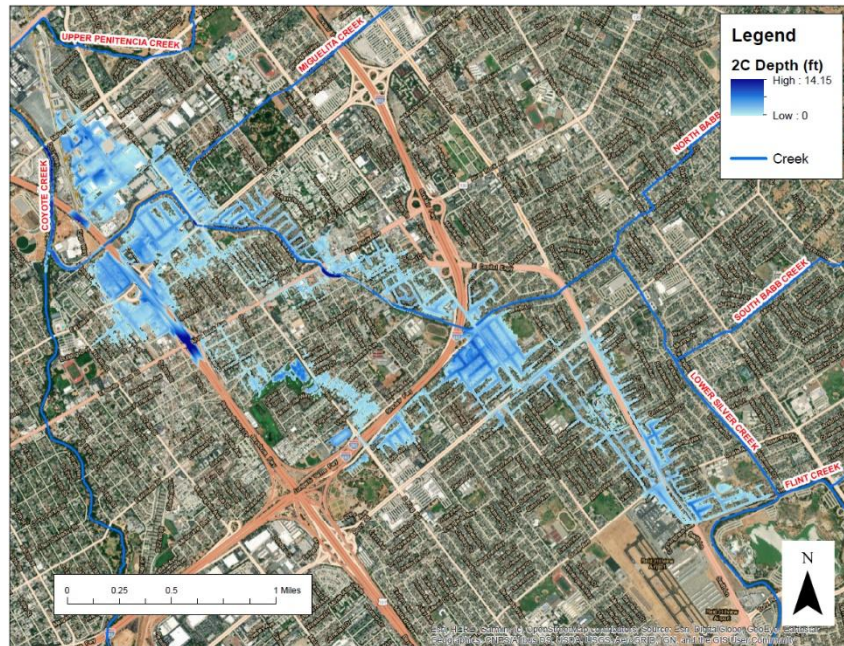


FIGURE 4E
Flooding due to Potential Levee Failure Location 2C at Lake Cunningham

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

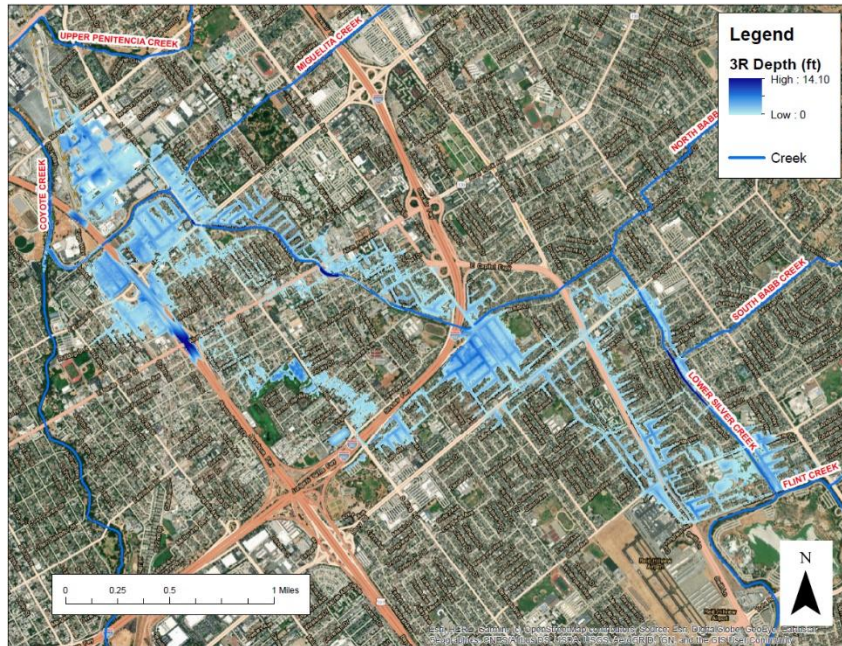


FIGURE 5E
Flooding due to Potential Levee Failure Location 3R at Lake Cunningham



FIGURE 6E
Modeled Large Levee Failure at Lake Cunningham Detention Facility

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

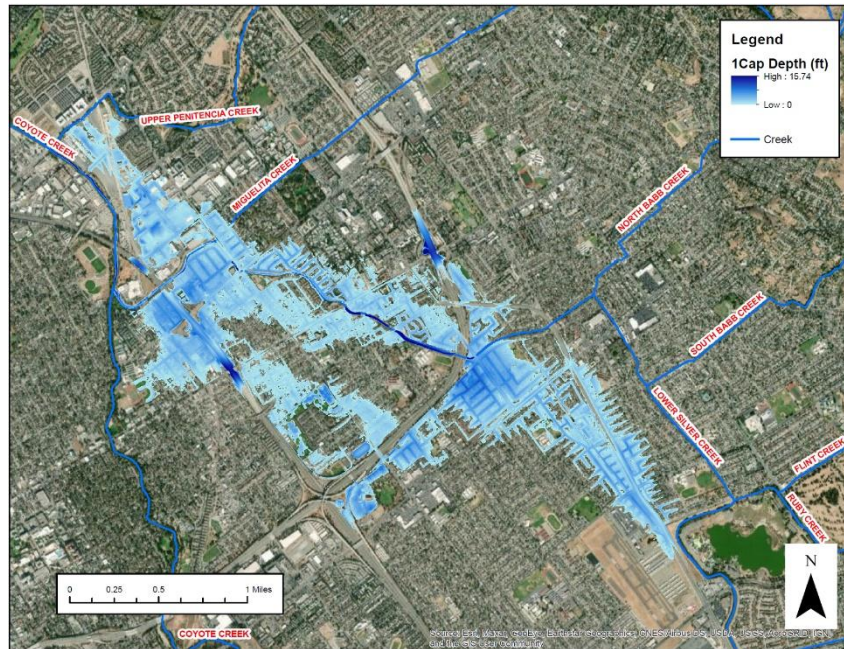


FIGURE 7E
Flooding due to Large Levee Failure Location 1Cap at Lake Cunningham

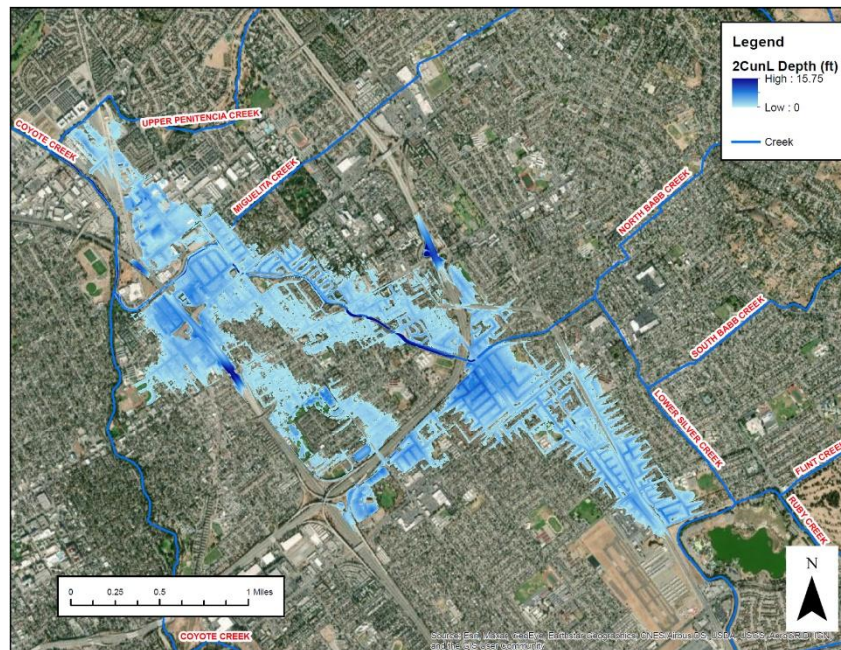


FIGURE 8E
Flooding due to Large Levee Failure Location 2CunL at Lake Cunningham

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

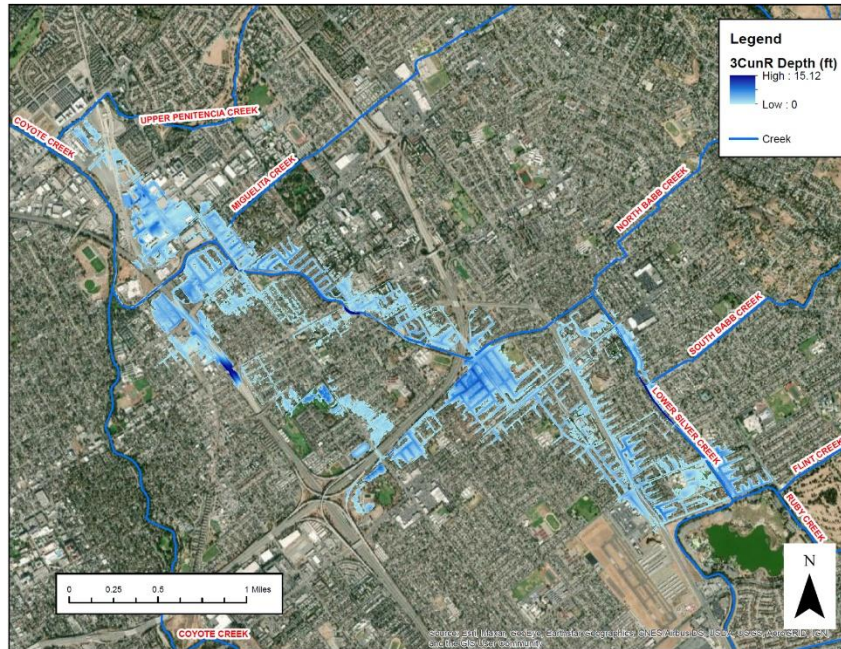


FIGURE 9E
Flooding due to Large Levee Failure Location 3CunR at Lake Cunningham

FLOOD EVENT DETECTION

The flood event detection methods include weather forecasts, hydrologic/hydraulic modeling, Automated Local Evaluation in Real Time (ALERT) stream/reservoir/precipitation gauge systems, and field observation of stage gauges and other areas of high flow.

Of these methods, the gauging and field observation methods specific to Lower Silver Creek are described below:

ALERT Gauge System

A listing of all ALERT gauges in the Coyote Creek Watershed can be found at <http://alert.valleywater.org>. These gauges provide data in near real-time at several locations in the watershed. Upstream gauges will provide valuable information for flood events occurring downstream and may give advance notice to take action. However, the ALERT gauge on Thompson Creek at Quimby Road just upstream of the confluence will be the primary gauge used for determining the flood condition on Lower Silver Creek. The downstream gauge on Lower Silver Creek at San Antonio Road will be used as another indicator of the functioning of the Lake Cunningham detention facility and possible concerns in the downstream reaches of the creek.

APPENDIX E

Lower Silver Creek and Lake Cunningham (continued)

The following is a summary of the current stream gauge program:

1. Annually sites will be prioritized for manual gauging and teams are assigned.
2. After every recorded high flow event, the rule curves (depth versus discharge) are updated/calibrated. High flow calibration in the Coyote Watershed was done after the 1995 event and some were completed after the 2017 winter high flows.

Visual Observations

Visual observations can be critical to verify what is occurring because ALERT gauges are not always a reliable source of information and modeling information can vary from the actual condition. In addition, there are other known hot-spots and facilities that should be visually checked during high flows. Therefore, supplementing with visual observations by viewing real-time images from WebCams (Valley Water Surface Water Data Portal – <http://alert.valleywater.org>), staff deployed in the field (i.e., Field Information Teams) and other field reporting is an important component to detection.

Valley Water operates Field Information Teams (FITs) that are assigned to specific locations during storms and high flow events to provide this valuable information. In addition, the City Parks, Recreation & Neighborhood Services has staff that maintains, operates, and patrols Lake Cunningham Park and other City Departments deploy FIT teams in a coordinated way to assure that all critical locations are being monitored. Locations of FIT deployment by the City and Valley Water may overlap during storm and flood events. The EAP Multi-Agency Coordination (MAC) Group and/or the jurisdictions EOC will coordinate this effort through the Planning/Intelligence Section so that resources are most effectively utilized and information is shared.

Valley Water Hot-Spots for possible FIT deployment are:

1. Visual stream gauges—checking for high water and rate of change
2. Known Flood Hot-Spots (Attachment 11 page 63 of Joint Emergency Action Plan for Severe Storm and Flood Response in City of San José Volume 1)
3. Real-time Flooding—documenting flooding
4. Bridge Piers—checking for debris blockages
5. Trash Racks—checking for debris blockages
6. Levees downstream of Highway 101—check for stability
7. Sandbag sites—checking for supply and access issues
8. Previously repaired or other project sites—checking for performance
9. Raw water facilities—dams and canals

LOWER SILVER CREEK FLOOD READINESS LEVELS

Sometimes an event is a flash flow that occurs suddenly without much early notice, which is the situation upstream of Capital Expressway on Lower Silver Creek. However, with weather forecasting and computer modeling of the watersheds there is often an ability to estimate high flow events before they occur. This is extremely valuable when preparing for necessary evacuations and road closures.

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

To provide this advanced notice, a readiness level will be used to provide an indicator of preparedness for a response to assist the Agency’s in planning and implementing appropriate actions. Due to uncertainties of forecasting future conditions, a level of Watch will be used when 90% to 100% of the 100-year (1%) flow stage is estimated about 24 to 48 hours or more in the future. If this high flow is estimated within about 24 hours, the level will be elevated to Warning. [Table 1E](#) shows the stage for flow rates at two ALERT monitoring gauges that can be used to set the readiness level.

Since Lower Silver Creek and Lake Cunningham have been improved to provide 100-year (1%) flood protection, the highest level expected would be Monitoring (Yellow) except in an extreme storm event that would result in a 1% flow or during other unexpected conditions (Attachment 12 – Guidance Table for Evaluating Facility During High Flow and Determining Readiness Level of Joint Emergency Action Plan for Severe Storm and Flood Response in City of San José Volume 1). In addition, a level of severity would not be set as for other flood prone facilities because of the flood protection improvements.

PREPAREDNESS	<p>This is the base Preparedness is defined as:</p> <ul style="list-style-type: none"> • Flood stage (Minor Flooding or greater) is not estimated within the next 72 hours or • Measured stream depth is below 50% of flood stage.
MONITORING	<p>This condition is variable and requires more intense monitoring and a heightened level of alertness. A portion of the Emergency Management Organization (EMO) may be active to monitor for any developing flood concern. Monitoring is defined as:</p> <ul style="list-style-type: none"> • Flood stage may occur in 48 to 72 hours, or • Measured stream depth is at 50% to 70% of flood stage, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or near design stage within 24 hours.
WATCH	<p>Flood level or a serious flood threat is expected to occur. Multiple portions of the EMO may be activated at an appropriate level. Watch is defined as:</p> <ul style="list-style-type: none"> • Stream depth is estimated to reach flood stage or greater within 24 to 48 hours, or • Measured stream depths are at 70% to 100% of flood stage, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater than design stage within 6-12 hours.
WARNING	<p>This is a more urgent situation with flooding imminent or occurring. The EMO is more completely active. Warning is defined as:</p> <ul style="list-style-type: none"> • Flood stage or greater is occurring or is estimated to occur within 24 hours, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater within minutes/hours or is occurring.
<p>Note: Flood stage is the depth of water at which a stream or facility begins flooding (see Glossary of Terms).</p>	

APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)

NOTIFICATIONS AND ACTIVITY/ACTIONS

Notifications and actions are described in the Joint EAP which describes readiness level, notifications and activity/actions to be taken by both the City, Valley Water and other stakeholders. The level of activity will be guided by the best information available to the Agency Subject Matter Experts (SMEs) and Agency Coordinators (ACs). The level of activity may mirror those activities of the individual jurisdictional Emergency Operations Centers (EOCs). As weather conditions merit and monitoring take place, the SMEs and ACs may be in their home offices or their jurisdiction’s EOC, if activated. The “call to action” may be a series of phone calls among the SMEs and ACs to determine the best approach to coordination.



INFRASTRUCTURE AT RISK

There are no Federal Emergency Management Agency (FEMA) defined critical facilities located in the floodplain, however, there are other important infrastructure where people, property, and important facilities may be at risk. Based on intelligence gathered during the storm event, the MAC will determine the risk and provide notifications as appropriate. The facilities below are within the area where people, property, and infrastructure may be at risk:

FACILITY TYPE	NAME	ADDRESS	PHONE
Schools	Ann Darling Elementary School	333 N 33 rd Street San José, CA 95133	(408) 535-6209
	Rocketship Elementary School	2249 Dobern Avenue, San José, CA 95116	(408) 824-5180
	Aptitude Community Academy at Goss	2475 Van Winkle Lane, San José, CA 96116	(408) 928-7650
	Ryan Elementary	1241 McGinness Avenue San José, CA 95127	(408) 928-8650
Other	The San Jose Cambodian Buddhist Society	2751 Mervyns Way San José, CA 95127	(408) 770-9171
	US Postal Service	1085 McGinness Avenue San José, CA 95127	(800) 275-8777

**APPENDIX E
Lower Silver Creek and Lake Cunningham (continued)**

**TABLE 1E
Lower Silver Creek ALERT Gauges – Flow Rate Stages**

Index Location	Percent of 100-Year Stage at Monitoring Location				Photo
	50% of 100-Year	70% of 100-Year	90% of 100-Year	100-Year	
Thompson Creek at Quimby Road	4-5' (1,645 cfs)	5.7' (2,303 cfs)	6.3' (2,961 cfs)	6.6' (3,290 cfs)	
Lower Silver Creek at San Antonio St.	7' (1,760 cfs)	7.9' (2,464 cfs)	8.8' (3,168 cfs)	9.2' (3,520 cfs)	
<p>Disclaimer: The flooding thresholds in this table are based on hydraulic modeling results calibrated with data collected during high flows and flood events. Hydraulic modeling results may be preliminary and should be used for general analysis purposes. Information is accurate within the model limitations and assumptions/data used for model development. The most current flood severity thresholds are at https://alert.valleywater.org/map?p=map. Use care while interpreting results.</p>					

APPENDIX F

Upper Penitencia Creek

PURPOSE

This Appendix to the Joint Emergency Action Plan (EAP) for Severe Storms and Flooding in the City of San José is meant to provide additional guidance specific for Upper Penitencia Creek. It will not duplicate information already in an Emergency Operations Plan (EOP) or the EAP, but will provide Upper Penitencia Creek specifics for:

1. Incident detection
2. Evaluation and readiness level classification
3. Notification and communications
4. Emergency actions

UPPER PENITENCIA CREEK DESCRIPTION

The Upper Penitencia Creek Watershed ([Figure 1F](#)) is in the eastern portion of the City of San José (City) and in the unincorporated area of the County of Santa Clara and is bounded on the east by the Diablo Range and on the west by the Coyote Watershed. The watershed is about 24 square miles (15,300 acres) and is best described by dividing it into 2 areas. The watershed upstream of Dorel Avenue is about 21 square miles and is in steep foothills relatively undeveloped while the 3 square mile region downstream of Dorel Avenue is in the highly urbanized gently sloping valley floor. The upper watershed is oblong in shape and is about 10 miles long and up to 5 miles wide. The lower and flatter area, which constitutes about 12% of the watershed, is rectangular and about 4.2 miles long and relatively narrow. It is highly urbanized with an extensive open space park system along the creek.

Arroyo Aguague is a major tributary that joins Upper Penitencia Creek about 7 miles upstream of the Coyote Creek confluence in the upper watershed area and is about 54% of the total watershed area. Arroyo Aguague continues for about 9 miles to the top of the watershed at an elevation of about 2,600 feet. The City owns and operates Alum Rock Park upstream of Dorel Avenue and the 500 acre-foot Cherry Flat Reservoir about 5 miles upstream of that road crossing.

Upper Penitencia Creek is generally an earth vegetated stream with highly valued wildlife and fishery habitat. Upper Penitencia Creek is an intermittent stream (generally dry in the summer months) and considered one of the better steelhead fish habitats in the south bay area because of the earth and gravel channel with significant vegetation.

Santa Clara Valley Water District (Valley Water) operates groundwater recharge facilities adjacent to the creek downstream of Toyon Drive that includes a diversion structure and overflow weir at the downstream end of the Gross Percolation Facility that are not currently operated.

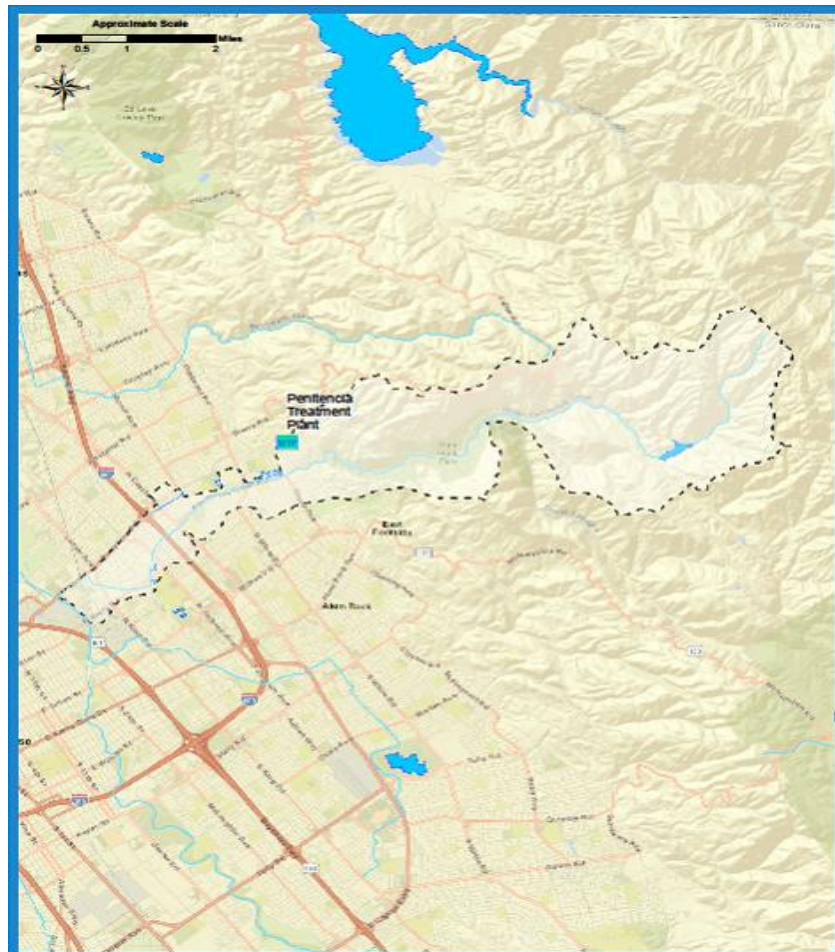
Valley Water has a significant amount of land rights along the creek, but most of the creek is classified as unmodified channel (i.e., no flood protection capital improvement projects). Even though Valley Water has land rights, there is no level of service for design flow conveyance to which Valley Water (or any other entity) is to maintain.

APPENDIX F Upper Penitencia Creek (continued)

There is a 163-acre linear park and 4-mile long pedestrian trail along Upper Penitencia Creek from Alum Rock Park to Coyote Creek that is managed collaboratively by the County of Santa Clara and the City. This trail has several pedestrian bridges that cross over the creek.

Valley Water has worked for many years with the federal government to plan a flood protection project and has worked with the City and County of Santa Clara to preserve floodways in their park systems. Recent studies by the Army Corps of Engineers did not find sufficient economic benefit to justify federal participation.

As a result, in 2019, the Valley Water Board of Directors targeted the use of local funds to complete a project from the confluence with Coyote Creek to Capitol Avenue. Following a January 24, 2023 Valley Water Board of Directors Public Hearing on the Proposed Modifications to Projects under Priorities D and E of the Safe, Clean Water and Natural Flood Protection Program, there is no funding allocation for construction of said project. Valley Water will reassess construction funding availability annually as part of its Capital Improvement Plan financial planning process. An Upper Penitencia Creek reach map is shown in [Figure 2F](#) followed by reach descriptions.



**FIGURE 1F
Upper Penitencia Creek Watershed**

APPENDIX F
Upper Penitencia Creek (continued)

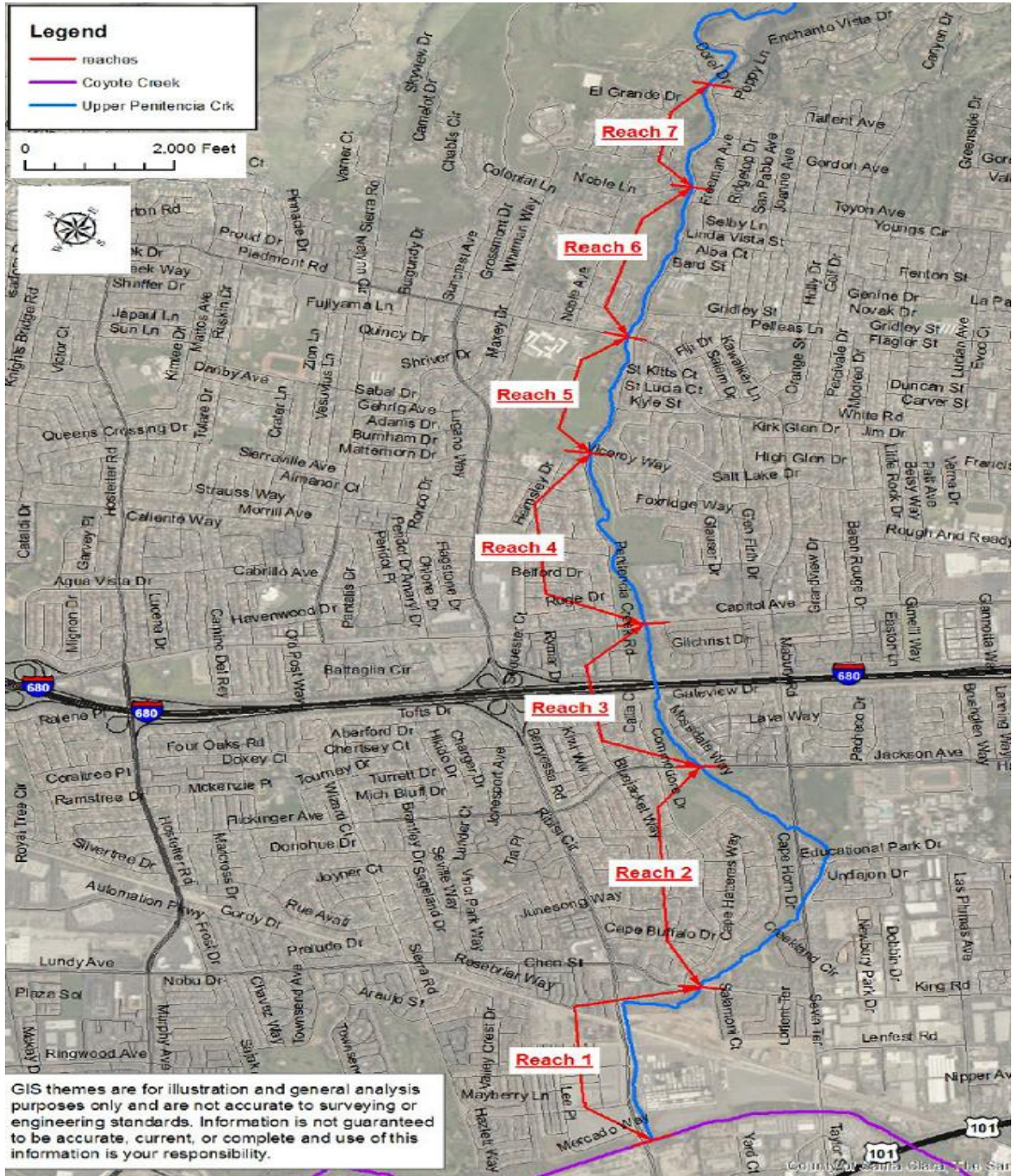


FIGURE 2F
Upper Penitencia Creek Reach Map

APPENDIX F Upper Penitencia Creek (continued)

Upper Penitencia Creek has been divided into 8 reaches; the first 7 are shown in [Figure 2F](#). Below is a listing of the reaches followed by descriptions and pictures of the reaches.

- Reach 1 – Coyote Creek to King Road
- Reach 2 – King Road to Jackson Avenue
- Reach 3 – Jackson Avenue to Capitol Avenue
- Reach 4 – Capitol Avenue to Viceroy Way
- Reach 5 – Viceroy Way to Piedmont Road
- Reach 6 – Piedmont Road to Noble Avenue
- Reach 7 – Noble Avenue to Dorel Road
- Reach 8 – Dorel Road to Limit of Jurisdiction

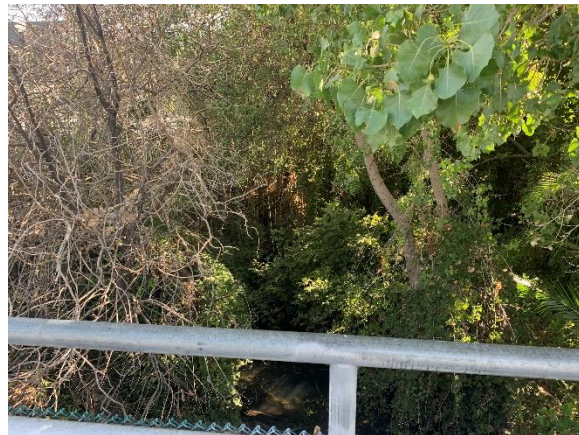
Reach 1 – Coyote Creek to King Road

The downstream portion of the reach from the confluence with Coyote Creek to upstream of Berryessa Station Way is a straight earthen channel with heavy vegetation. In this straight reach, Berryessa Road runs along the north side of the creek and the San José Flea Market is on the south. At the confluence with Coyote Creek the channel is in a 6-foot corrugated metal pipe (CMP) that is under a pedestrian undercrossing of Berryessa Road. There is a 110-degree bend in the channel upstream of the Bay Area Rapid Transit (BART) system's Berryessa Station Way bridge. In addition to the bridge at Berryessa Station Way, there are two small bridge crossings into the San José Flea Market. Valley Water's Central Pipeline crosses under the creek just upstream of the BART railway bridge crossing.

Adjacent land use is generally privately-owned commercial property except on the south side of the creek upstream of the elevated BART railway crossing where the Penitencia Creek Park trail begins. The creek is privately owned up to the BART railway where the trail and public right of way (including Valley Water fee and easement) begins and generally extends upstream for about 4 miles to Dorel Road. There are likely to be unregulated tent encampments near the confluence with Coyote Creek.



Looking downstream along Berryessa Road.



Looking upstream from San Jose Flea Market bridge

APPENDIX F Upper Penitencia Creek (continued)



Reach 1 Map

Reach 2 – King Road to Jackson Avenue

The creek is predominantly a vegetated earthen channel through this reach connected to a wide 150- to 300-foot-wide overflow floodplain that bypasses the Mabury Road meander. The floodplain is to the north of the creek channel and Mabury Road and is slightly above bankfull elevation. Flows enter the floodplain at Jackson Avenue and over a lateral weir between Jackson Avenue and Mabury Road. The flows in the floodplain bypass can return to the main channel about 400 feet upstream of King Road.

There is a pedestrian bridge just upstream of King Road and an abandoned bridge crossing about 1200 feet upstream that provides pedestrian access across the creek into the floodplain. Between the two Mabury Road crossings the creek is trapezoidal earth with some sack rip rap, a bridge at Educational Park Drive and some non-engineered farm levees.

There is a stream gauge just downstream of the upstream Mabury Road crossing near a water diversion that provides water to an adjacent percolation pond and to ponds in Overfelt Gardens.

The creek upstream of Mabury Road is a shallow earthen channel and also has farm levees that are not in good condition. There is a park and pedestrian path on the south side of the creek and a lateral weir on the north side about 500 feet upstream of Mabury Road. The Jackson Avenue bridge spans the floodplain area to allow for high flows to pass under the roadway.

APPENDIX F Upper Penitencia Creek (continued)

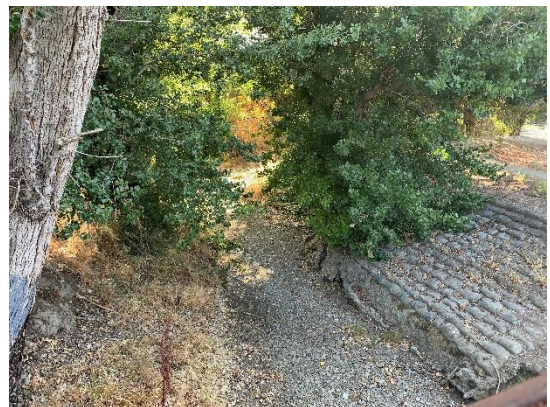
As Upper Penitencia Creek is classified as an unmodified channel, even though Valley Waters has some fee-title and easement land rights through this reach, there is no level of service for design flow conveyance to which Valley Water (or any other entity) is to maintain. Valley Water does not have any property rights between Educational Park Drive and the upstream Mabury Road crossing, which is the location of the stream gauge.



Reach 2 Map



Looking downstream at King Road & Ped bridge



Looking upstream from King Road Ped bridge

APPENDIX F
Upper Penitencia Creek (continued)



Looking east on Mabury Road from downstream crossing (Mabury Bypass is on left).



Looking upstream at Mabury Road upstream crossing from stream gauge weir.



Looking upstream at upper Mabury Road crossing.



Looking upstream from Mabury Road (creek on left) along pedestrian path.



Looking downstream from Jackson Ave at Mabury Bypass.

APPENDIX F
Upper Penitencia Creek (continued)

Reach 3 – Jackson Avenue to Capitol Avenue

The stream channel is vegetated earthen channel with a floodplain adjacent to the top of bank. High flows can flow in the floodplain to the north of the creek channel upstream of Jackson Avenue and pass under the wide bridge. A pedestrian path continues on the south of the creek and crosses under the Interstate 680 bridge. There is a VTA light rail station at the Capitol Avenue Bridge. Valley Water owns mostly fee-title property rights through this reach that includes the pedestrian path.



Reach 3 Map

APPENDIX F
Upper Penitencia Creek (continued)



Looking upstream across Jackson Ave bridge.



Upstream Jackson Ave culvert entrance.



Looking upstream at I-680 (creek on left).



Looking upstream across Capitol Ave.

APPENDIX F
Upper Penitencia Creek (continued)



Looking upstream from Ped bridge.



Looking at levee along Stonecrest Way at Viceroy Way intersection.



Looking downstream with Stonecrest Way levee on left and creek on right.

APPENDIX F Upper Penitencia Creek (continued)

Reach 5 – Viceroy Way to Piedmont Road

Upstream of Viceroy the creek crosses Penitencia Creek Road and continues as a vegetated earthen channel. The creek is bordered on the south by the roadway and on the north by Penitencia Creek Park, Wildlife Center of Silicon Valley and a pedestrian path. There is a pedestrian crossing constriction in the creek about 1,000 feet downstream of Piedmont Road.

The park can act as a floodway during high flows. A stream gauge is located just downstream of Piedmont Road bridge.

Valley Water owns fee-title for about 900 feet starting upstream of the Penitencia Creek Road crossing. Most of the creek and the adjacent park are owned by the County of Santa Clara.



Reach 5 Map

APPENDIX F
Upper Penitencia Creek (continued)



Looking downstream at Penitencia Creek Rd.



Looking upstream in Penitencia Creek Park
(creek is on the right)



Stream gauge downstream of Piedmont Rd.

APPENDIX F Upper Penitencia Creek (continued)

Reach 6 – Piedmont Road to Noble Avenue

Upper Penitencia Creek continues in this reach as a vegetated earthen channel bordered on the south by Penitencia Creek Road and on the north by the pedestrian trail and water diversion and settling ponds. The pedestrian path is immediately adjacent to a church and residential homes in the downstream sections and then goes through the Gross Percolation Facility before reaching Noble Avenue.

There is a non-functional water diversion and fish ladder just upstream of Noble Avenue that historically diverted water to the Bob Gross Percolation Ponds via the Penitencia Ponds Canal. Water is now supplied to the ponds from the South Bay Aqueduct, which flows through the three ponds. The downstream pond has an overflow weir to Upper Penitencia Creek and can also flow to the Piedmont Ponds. There is also an overflow into Upper Penitencia Creek at the downstream end of the Piedmont Ponds.

Valley Water owns about half of this reach in either fee-title or easement with the remainder owned by either the City, County of Santa Clara or Berryessa Union School District.



Reach 6 Map

APPENDIX F
Upper Penitencia Creek (continued)



Pond overflow to creek near Piedmont Rd.



Looking upstream Penitencia Pond Canal.



Pond overflow to creek at Bob Gross Ponds.



Looking upstream at Noble Ave (creek on right).



Looking east at Bob Gross Ponds (creek on right).

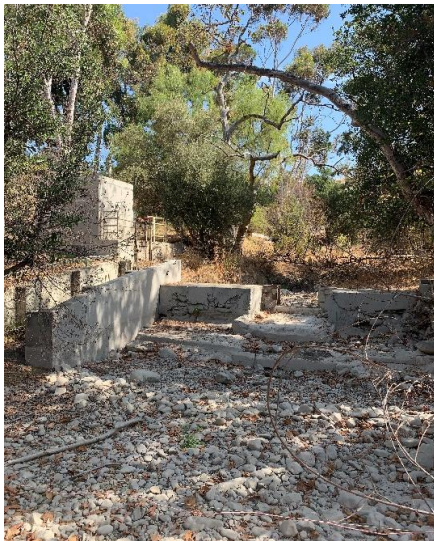
APPENDIX F
Upper Penitencia Creek (continued)

Reach 7 – Noble Avenue to Dorel Drive

Upstream of Noble Avenue the foothills begin to the north of the creek. The creek continues along Penitencia Creek Road with a pedestrian path between the top of bank and the road. There is an old water diversion structure and fish ladder no longer functional just upstream of Noble Avenue. A stream gauge is located just downstream of Dorel Drive. Valley Water owns fee-title from Noble Avenue to about 500 feet upstream. The remainder of the property in the reach is owned by the City including the stream gauge at Dorel Drive.



Reach 7 Map



Looking upstream at Noble Diversion.



Looking upstream – Penitencia Creek Rd on right.

APPENDIX F
Upper Penitencia Creek (continued)



Dorel Drive stream gauge.



Dorel Drive radar gauge.

Reach 8 – Dorel Drive to Limit of Jurisdiction

Upper Penitencia Creek upstream of Dorel Drive passes some rural residential parcels and enters the City of San José's Alum Rock Park. The creek continues in a natural unmodified condition through the park and into the sparsely developed upper watershed area that has steep hills, deep and narrow canyons, and has numerous landslides. A pedestrian and trail system continues along or near the creek through much of the park. About 5 miles upstream is the 500 acre-foot Cherry Flat Reservoir owned by the City of San José. Valley Water owns some easement just upstream of Alum Rock Park and some fee-title upstream of Cherry Flat Reservoir.



Just upstream Dorel Drive looking at a private bridge crossing.

APPENDIX F
Upper Penitencia Creek (continued)

UPPER PENITENCIA CREEK FLOOD THREATS

Upper Penitencia Creek has a long history of flooding with the greatest flood likely occurring in 1911 before stream gauge data existed. This flood was described in the local newspaper as overflowing the banks all the way from Alum Rock Canyon to the Coyote Creek. They reported that floodwater was three feet deep at Capitol Avenue and several bridges were washed away. Other significant flooding occurred in 1955, 1958, 1962, 1973, 1978, 1980, 1982, 1983, 1986, 1995, and 1998.

The greatest flow recorded on Upper Penitencia Creek was estimated at about 3,730 cfs in 1958. This flow exceeded the capacity of the creek which generally ranges from about 500 cfs near King Road to 1,700 cfs between Jackson Avenue and Capitol Avenue. Below are creek capacities by reach. It should be noted that creek capacities described or identified in the table below are estimated and should not be understood to be akin to levels of service or design flow conveyance capacities.

Reach	Reach Description	Channel Capacities*	Approximate Storm Event
1	Coyote Creek to King Rd.	500 cfs	2 to 5 year
2	King Rd. to Jackson Ave.	500 cfs	2 to 5 year
2a	Mabury Rd. Bypass	900 cfs	5 to 10 year
3	Jackson Ave. to Capitol Ave.	1700 cfs	10 to 25 year
4	Capitol Ave. to Penitencia Creek Rd.	1000 cfs	5 to 10 year
5	Penitencia Creek Rd. to Piedmont Ave.	1200 cfs	10 year
6	Piedmont Ave. to Noble Ave.	700 cfs	5 year
7	Noble Ave. to Dorel Dr.	1500 cfs	10 year
*Upper Penitencia Creek is considered an unmodified channel, so the capacities are estimates and should not be considered a level of service or a design flow conveyance capacity.			

During a 100-year flood event, floodwaters would breakout at many locations causing localized flooding impacting about 8,000 to 9,000 parcels. Floodwaters will initially break out into the Mabury Road Bypass and could flow out onto Mabury Road and Cape Horn Drive. Overtopping at Piedmont Road will flow north towards the City of Milpitas. Flooding to the south will generally only extend to McKee Road with some flowing down Interstate 680 and Alum Rock Avenue.

Most flood depths are 1 foot or less in the sheet flooding areas with some deeper flooding in ponding locations, such as, Interstate 680 at Alum Rock Avenue and near the confluence of Lower Penitencia Creek and Berryessa Creek. [Figure 3F](#) shows the FEMA 100-year floodplain.

APPENDIX F
Upper Penitencia Creek (continued)

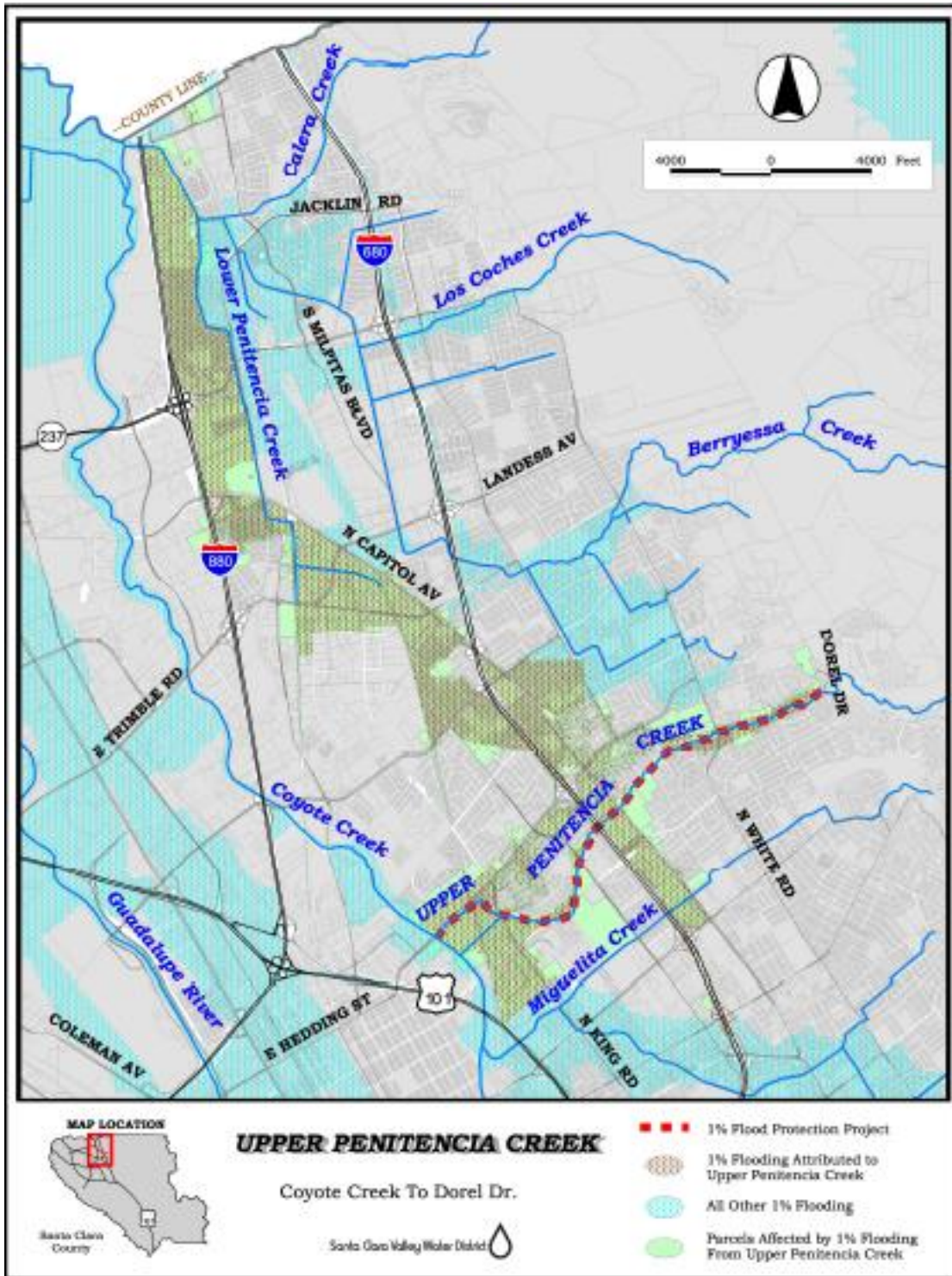


FIGURE 3F
Upper Penitencia Creek FEMA Flood Map

APPENDIX F

Upper Penitencia Creek (continued)

FLOOD EVENT DETECTION

The flood event detection methods include weather forecasts, hydrologic/hydraulic modeling, Automated Local Evaluation in Real Time (ALERT) stream/reservoir/precipitation gauge systems, and field observation of stage gauges and other areas of high flow.

Of these methods, the gauging and field observation methods specific to Upper Penitencia Creek are described below:

ALERT Gauge System

A listing of all ALERT gauges in the Coyote Creek Watershed can be found at <http://alert.valleywater.org>. These gauges provide data in near real-time at several locations in the watershed. Upstream gauges will provide valuable information for flood events occurring downstream and may give advance notice to take action. However, the ALERT gauge on Upper Penitencia Creek at Piedmont Road will be the primary gauge used for determining the flood condition. The Dorel Road gauge and the downstream gauge on Upper Penitencia Creek at Mabury Road may be used as other indicators of the functioning of creek and overflow area.

The following is a summary of the current stream gauge program:

1. Annually sites will be prioritized for manual gauging and teams are assigned.
2. After every recorded high flow event, the rule curves (depth versus discharge) are updated/calibrated. High flow calibration in the Coyote Watershed was done after the 1995 event and some were completed after the 2017 winter high flows.

Visual Observations

Visual observations can be critical to verify what is occurring because ALERT gauges are not always a reliable source of information and modeling information can vary from the actual condition. In addition, there are other known hot-spots and facilities that should be visually checked during high flows. Supplementing with visual observations by viewing real-time images from WebCams (Valley Water Surface Water Data Portal – <http://alert.valleywater.org>), staff deployed in the field (i.e., Field Information Teams) and other field reporting is an important component to detection.

Valley Water operates Field Information Teams (FITs) that are assigned to specific locations during storms and high flow events to provide this valuable information. In addition, the City Parks, Recreation & Neighborhood Services has staff that maintains, operates, and patrols Upper Penitencia Creek Park and other City Departments deploy FIT teams in a coordinated way to assure that all critical locations are being monitored. Locations of FIT deployment by the City and Valley Water may overlap during storm and flood events. The EAP Multi-Agency Coordination (MAC) Group and/or the jurisdictions EOC will coordinate this effort through the Planning/Intelligence Section so that resources are most effectively utilized and information is shared.

APPENDIX F
Upper Penitencia Creek (continued)

Valley Water Hot-Spots for possible FIT deployment are:

1. Visual stream gauges—checking for high water and rate of change. Bridges at King Road and Upstream Mabury Road crossing are good indicators of flooding downstream and an overlay of a gauge is shown in [Table 1F](#).
2. Known Flood Hot-Spots (Attachment 11 pages 60-62 of Joint Emergency Action Plan for Severe Storm and Flood Response in City of San José Volume 1)
3. Real-time Flooding—documenting flooding
4. Bridge Piers—checking for debris blockages
5. Trash Racks—checking for debris blockages
6. Sandbag sites—checking for supply and access issues
7. Previously repaired or other project sites—checking for performance
8. Raw water facilities—dams and canals

UPPER PENITENCIA CREEK FLOOD READINESS LEVELS

Sometimes an event is a flash flow that occurs suddenly without much early notice. However, with weather forecasting and computer modeling of the watersheds there is often an ability to estimate high flow events before they occur. This is extremely valuable when preparing for necessary evacuations and road closures.

To provide this advanced notice, a readiness level will be used to provide an indicator of preparedness for a response to assist the Agency’s in planning and implementing appropriate actions. Due to uncertainties of forecasting future conditions, a level of Watch will be used when 70% to 100% of the bankfull flow stage is estimated about 24 to 48 hours or more in the future. If flooding is estimated within about 24 hours, the level will be elevated to Warning. In addition, an unexpected situation may occur during high flows that may result in a change in readiness level (Attachment 12 – Guidance Table for Evaluating Facility During High Flow and Determining Readiness Level of Joint Emergency Action Plan for Severe Storm and Flood Response in City of San José Volume 1).

PREPAREDNESS	<p>This is the base stage of readiness that will be the typical condition throughout most of the year. Preparedness is defined as:</p> <ul style="list-style-type: none"> • Flood stage (Minor Flooding or greater) is not estimated within the next 72 hours or • Measured stream depth is below 50% of flood stage.
MONITORING	<p>This condition is variable and requires more intense monitoring and a heightened level of alertness. A portion of the Emergency Management Organization (EMO) may be active to monitor for any developing flood concern. Watch is defined as:</p> <ul style="list-style-type: none"> • Flood stage may occur in 48 to 72 hours, or • Measured stream depth is at 50% to 70% of flood stage, or

APPENDIX F Upper Penitencia Creek (continued)

	<ul style="list-style-type: none"> For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or near design stage within 24 hours.
WATCH	<p>Flood level or a serious flood threat is expected to occur. Multiple portions of the EMO may be activated at an appropriate level. Watch is defined as:</p> <ul style="list-style-type: none"> Stream depth is estimated to reach flood stage or greater within 24 to 48 hours, or Measured stream depths are at 70% to 100% of flood stage, or For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater than design stage within 6-12 hours.
WARNING	<p>This is a more urgent situation with flooding imminent or occurring. The EMO is more completely active. Warning is defined as:</p> <ul style="list-style-type: none"> Flood stage or greater is occurring or is estimated to occur within 24 hours, or For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater within minutes/hours or is occurring.
<p><u>Note:</u> Flood stage is the depth of water at which a stream or facility begins flooding (see Glossary of Terms).</p>	

When the level is at a Watch or Warning, there is an expectation that flooding will occur or is occurring at some locations. The severity of the situation at specific locations is determined by the flood stage. The areas subject to flooding for different stream stages are estimated utilizing hydraulic models, the FEMA flood map, and flood maps from recent modeling.

Flood severity categories are defined by the NWS as:

Action	An established gauge height which when reached by a rising stream, lake, or reservoir represents the level where action is taken in preparation for possible significant hydrologic activity.
Minor Flooding	Minimal or no property damage, but possibly some public threat (e.g., inundation of roads).
Moderate Flooding	Some inundation of structures and roads near stream, evacuations of people and/or transfer of property to higher elevations.
Major Flooding	Extensive inundation of structures and roads, significant evacuations of people and/or transfer of property to higher elevations.

A 100-year (1 percent) FEMA flood inundation map of Upper Penitencia Creek is shown in [Figure 2F](#) and the Flood Readiness Stages at King Road and the upstream Mabury Road crossing are shown in [Table 1F](#). The map is the Federal Emergency Management Agency (FEMA) 1 percent flood map. This map is based on the best available information and modeling when it was created and should be considered as approximate due to the difficulty in estimating an actual event and the changing conditions of the creek.

[Table 2F](#) is a flood severity table for the Upper Penitencia Creek at the Dorel Drive Gauge that is used to estimate areas that will be subject to flooding. Since there is very little notice for flooding based on this gauge, flood conditions will often utilize predictive methods based on weather forecast and watershed conditions. In addition, the gauge at Mabury Road may be used as additional information for potential flooding downstream.

APPENDIX F
Upper Penitencia Creek (continued)

These tables along with the actual or modeled data would allow Valley Water or MAC to establish threat levels for specific areas subject to flooding. Mapping associated with this table and any modeling will be provided to Agency Stakeholders if possible. This information will be made available for notifications and will be coordinated with the National Weather Service to be consistent in the dissemination of readiness level and severity information. The most current information regarding flood severity and flood thresholds is available at <https://alert.valleywater.org/map?p=map>.

NOTIFICATIONS AND ACTIVITY/ACTIONS

Notifications and actions are described in the Joint EAP which describes readiness level, notifications and activity/actions to be taken by both the City, Valley Water and other stakeholders. The level of activity will be guided by the best information available to the Agency Subject Matter Experts (SMEs) and Agency Coordinators (ACs). The level of activity may mirror those activities of the individual jurisdictional Emergency Operations Centers (EOCs). As weather conditions merit and monitoring take place, the SMEs and ACs may be in their home offices or their jurisdiction’s EOC, if activated. The “call to action” may be a series of phone calls among the SMEs and ACs to determine the best approach to coordination.

INFRASTRUCTURE AT RISK



There are no Federal Emergency Management Agency (FEMA) defined critical facilities located in the floodplain, however, there are other important infrastructure where people, property, and important facilities may be at risk. Based on intelligence gathered during the storm event, the MAC will determine the risk and provide notifications as appropriate. The facilities below are within the area where people, property, and infrastructure may be at risk:

FACILITY TYPE	NAME	ADDRESS	PHONE
Schools	Toyon Elementary School	995 Bard Street, San José, CA 95127	(408) 923-1965
	Independence High School	617 N. Jackson Avenue, San José, CA 95133	(408) 928-9500
	East Side Union High School District Headquarters	830 N. Capitol Avenue, San José, CA 95133	(408) 347-5000
	Summerdale Elementary School	1100 Summerdale Drive, San José, CA 95132	(408) 923-1960
	Piedmont Middle School	955 Piedmont Road, San José, CA 95132	(408) 923-1945
Fire Stations	San José Fire Station 23	1771 Via Cinco De Mayo, San José, CA 95132	(408) 794-7000
	San José Fire Station 34	1634 Las Plumas Ave., San José, CA 95133	(408) 794-7000
Other	Bay Area Rapid Transit Berryessa Station	1620 Berryessa Road, San José, CA 95133	(510) 464-6000
	VTA Light Rail – Penitencia Creek, Berryessa, Hostetter, and Cropley Stations	N. Capitol Ave.	911 or (408) 546-7688

**APPENDIX F
Upper Penitencia Creek (continued)**

FACILITY TYPE	NAME	ADDRESS	PHONE
	Wildlife Center of Silicon Valley	3027 Penitencia Creek Road, San José, CA 95132	(408) 929-9453

**TABLE 1F
Upper Penitencia Creek Flood Readiness Stages – Flow Rate Stages**

Index Location	Flooding Description	Flood Readiness Stage at Monitoring Location			Photo
		50% Capacity	70% of Capacity	100% Capacity	
Downstream of King Rd	Bank overtops on right side of the creek, flooding nearby homes and streets.	4.5'-5.5'	5.5'-6.5'	6.5'-7.5'	
Upstream Mabury Road (west)	Bank overtops on right side of the creek, flooding nearby homes and streets.	4.9'-5.9'	5.1'-6.1'	6.5'-7.5'	

Disclaimer: The flooding thresholds in this table are based on hydraulic modeling results calibrated with data collected during high flows and flood events. Hydraulic modeling results may be preliminary and should be used for general analysis purposes. Information is accurate within the model limitations and assumptions/data used for model development. The most current flood severity thresholds are at <https://alert.valleywater.org/map?p=map>. Use care while interpreting results.

APPENDIX F
Upper Penitencia Creek (continued)

TABLE 2F
Dorel Drive Gauge Flood Severity Thresholds (NWS Model)

Dorel Drive Gauge Thresholds	Stage (ft)	Description
Action	3.5	<ul style="list-style-type: none"> Culvert debris can adversely affect capacity at Mabury Rd and Educational Park Drive.
Minor Flooding	4.5	<ul style="list-style-type: none"> Bridges and surrounding areas near Mabury Road, Educational Park Drive, and King Road at risk of minor flooding.
Minor Flooding	4.5	<ul style="list-style-type: none"> Neighborhood streets around Commodore Drive and Cape Horn Court at risk, as well as flow onto Educational Park Drive. Overbanking begins to occur near Noble Ave along Penitencia Creek Road.
Moderate Flooding	6.5	<ul style="list-style-type: none"> Flooding worsens along Penitencia Creek Road with overbanking occurring at multiple locations, mostly spilling southward upstream of Capitol Avenue. The Commodore neighborhood experiences flooding. Neighborhood south of Educational Park Drive floods. Flea Market and surrounding area along Berryessa Creek at risk.
Moderate Flooding	7.5	<ul style="list-style-type: none"> Significant overbanking occurs on both sides of Upper Penitencia Creek throughout. Widespread flooding occurs, sheet flowing along roads to both the north and the south, ponding against I-680.
Major Flooding	8.5+	<ul style="list-style-type: none"> Sustained flooding would cause floodwaters to move northwesterly towards Capitol and I-680, as well as southwesterly toward McKee Road. I-680 at risk of flooding under the McKee and Alum Rock interchanges. Downstream of I-680, floodwaters move southwards toward Lower Silver Creek, and northwards following parallel to Coyote Creek, south of Lundy Avenue. Water may move further north toward Milpitas, crossing Montague Expwy and following Capitol Avenue toward I-880.
<p>Disclaimer: The flooding depths in this table are based on hydraulic modeling results calibrated with data collected during high flows and flood events. Hydraulic modeling results may be preliminary and should be used for general analysis purposes. Information is accurate within the model limitations and assumptions/data used for model development. This table is current as of the publishing of this document. The most current flood severity thresholds are at https://alert.valleywater.org/map?p=map. Use care while interpreting results.</p>		

APPENDIX F
Upper Penitencia Creek (continued)

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APPENDIX G

Berryessa Creek

A. PURPOSE. This Appendix to the Joint Emergency Action Plan for Severe Storm and Flood Response in City of San José (JEAP) is meant to provide additional guidance specific to Berryessa Creek. There is also a separate Emergency Action Plan for Severe Storms and Flooding in Lower Penitencia Creek Watershed (LPEAP) that was prepared and adopted by Valley Water that includes guidance for Berryessa Creek. That LPEAP was prepared as a separate document since there are flood issues outside the City of San José (i.e., City of Milpitas). This appendix should be sufficient for use during severe storms or flooding, however, if the focus of the event is in the City of Milpitas, the LPEAP may also be utilized.

B. BERRYESSA CREEK DESCRIPTION. The Berryessa Creek watershed drainage area is approximately 22.4 square miles in extent and drains portions of the Diablo Range on the east side of the Santa Clara Valley. About 5.4 square miles of the watershed is on the valley floor. The highest elevation in the watershed is approximately 2,500 feet.

The creek begins in the rural unincorporated foothills of the Diablo Mountain Range at an elevation of about 2,100 feet and flows downstream westerly for over 10 miles to its confluence with Lower Penitencia Creek at an elevation of about 3 feet above Mean Sea Level. The lower 5.7 miles of the creek from Old Piedmont Road to its confluence with Lower Penitencia Creek is on the valley floor. The first 2.3 miles after it flows out of the foothills are located in the City of San José as it flows past residential properties, Majestic Elementary School and through Berryessa Creek Park. It then turns to the north into the City of Milpitas and runs about 2 miles primarily through commercial and industrial land uses before flowing past more residential areas all the way to its confluence with Lower Penitencia Creek.

Berryessa Creek crosses many local roads, major thoroughfares, and other important infrastructure. The major roadway crossings include Interstate 680, Montague Expressway, and Calaveras Boulevard. The critical infrastructure it crosses over or under are South Bay Aqueduct Pipeline, Union Pacific Railroad railway, Hetch- Hetchy Pipeline, and the Bay Area Rapid Transit (BART) railway. Tributary creeks on the valley floor from upstream to downstream are Sweigert Creek, Sierra Creek, Piedmont Creek, Los Coches Creek, Tularcitos Creek and Wrigley-Ford Creek.

Upstream of Old Piedmont Road the creek is unmodified natural channel on private range lands with the exception of approximately 500 feet of Valley Water right of way just upstream of the road. Downstream of Old Piedmont Road the creek is mostly excavated trapezoidal channel with some areas of concrete lining upstream of Montague Expressway and some vegetated earth channel through Berryessa Park. There are levees and/or floodwalls along the creek upstream of the confluence with Lower Penitencia Creek to about Calaveras Boulevard. In addition, there are some short sections with levees from Morrill Avenue to near Majestic Elementary School (about 1,500 feet downstream of Piedmont Road).

Valley Water has easement or fee-title right of way on most of Berryessa Creek from Old Piedmont Road to the confluence with Lower Penitencia Creek with the exception of roadway crossings and portions of Berryessa Creek Park where the City of San José has the right of way and the creek is a vegetated earth channel with levees.

APPENDIX G Berryessa Creek (continued)

Sedimentation and erosion can be issues on the creek. There are reaches and areas with bank stabilization (concrete, sacked concrete, articulated concrete block mats, or rock) and several locations of channel invert stabilizers (concrete drop structure, concrete energy dissipation structures and concrete trapezoidal channel). Deposition of sediment from the upper watershed areas should primarily occur from Old Piedmont Road to just downstream of Piedmont Road.

REACH DESCRIPTIONS

- a. **Reach 1 – Lower Penitencia Creek to Abel Street.** This 2,500-foot reach is an earthen trapezoidal channel with a floodwall and a depressed articulated concrete mat maintenance road on the west side. The east side is protected by a levee with a top of levee maintenance road. Calera Creek enters on the east side about 900 feet upstream of Lower Penitencia Creek confluence. Tidal action from the San Francisco Bay occurs through this reach. Valley Water owns fee-title property rights in the reach.



Reach 1 – Lower Penitencia Creek Confluence to Abel Street

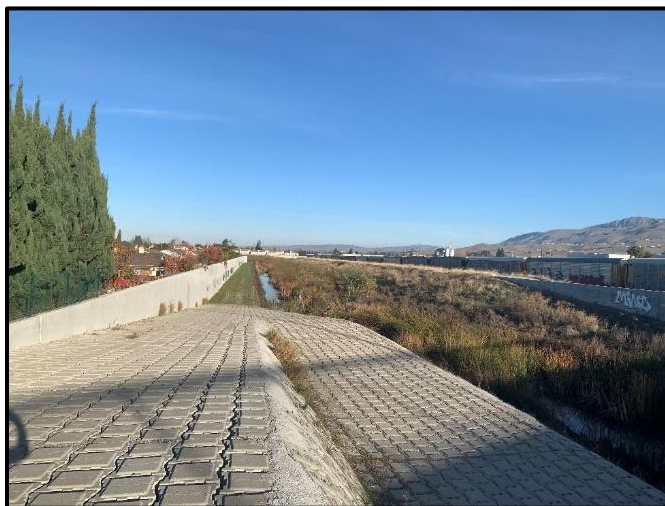
APPENDIX G
Berryessa Creek (continued)



Reach 1 – Looking Downstream at Lower Penitencia Creek confluence with Berryessa Creek and levee on right



Reach 1 – Looking from Lower Penitencia Creek floodwall on right and levee on left



Reach 1 – Looking downstream from Abel Street

b. **Reach 2 – Abel Street to Milpitas Boulevard.** The reach is approximately 2,200 feet in length with a floodwall on the west bank and a combination of levee and short sections of floodwall on the east bank. The City of Milpitas Wrigley-Ford Creek pump station discharge is just upstream of Abel Street and has capacity to discharge up to 430 cfs and the City of Milpitas Berryessa pump station located just upstream at Hidden Lake discharges up to 150 cfs. Union Pacific Railroad (UPRR) crosses Berryessa Creek immediately upstream of Wrigley-Ford Creek with no maintenance access at the crossing. There are maintenance roads upstream of the UPRR with a top of levee maintenance road on the east that also serves as the Berryessa Creek Trail. On the west is a depressed articulated concrete mat maintenance road adjacent to the floodwall. Tidal action ends upstream of the UPRR crossing. Valley Water owns fee-title in this reach except for an easement at the UPRR crossing.



Reach 2 – Abel Street to Milpitas Boulevard

APPENDIX G
Berryessa Creek (continued)



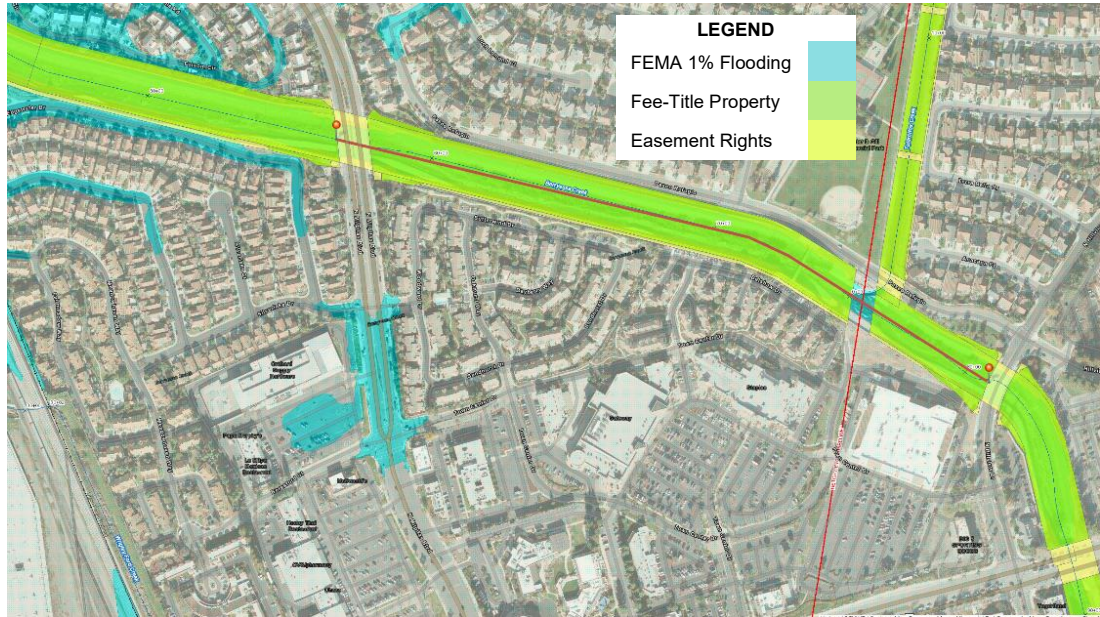
Reach 2 – Looking upstream from Abel Street at UPRR crossing and City of Milpitas Wrigley-Ford Creek Pump Station on right



Reach 2 – Looking downstream from Milpitas Boulevard

APPENDIX G
Berryessa Creek (continued)

- c. **Reach 3 – Milpitas Boulevard to Hillview Drive.** Reach 3 is a trapezoidal earth channel with vegetated channel bottom, a levee on the north bank and a floodwall on the south. There is a depressed articulated concrete mat maintenance road adjacent the floodwall and a top of levee maintenance road on the east that also serves as a pedestrian path operated by the City of Milpitas. A City of Milpitas pedestrian bridge crosses at about the mid-point of this reach just downstream of the Hetch-Hetchy crossing and Tularcitos Creek confluence. Valley Water owns fee-title with easements under the roadway bridge crossings and no right of way at the Hetch-Hetchy crossing.



Reach 3 – Milpitas Boulevard to Hillview Drive



Reach 3 – Looking downstream from pedestrian bridge at north levee

APPENDIX G
Berryessa Creek (continued)



Reach 3 – Looking downstream from pedestrian bridge at south floodwall



Reach 3 – Looking upstream from pedestrian bridge at north levee (left), south floodwall (right), confluence with Tularcitos Creek (on left), and Hetch-Hetchy crossing

APPENDIX G
Berryessa Creek (continued)

- d. **Reach 4 – Hillview Drive to Calaveras Boulevard.** This 600-foot reach is an earthen trapezoidal channel with floodwalls and levees. The Berryessa Creek Trail/Maintenance Road is located on the top of levee on the east side and there is a maintenance road on the west side adjacent to a floodwall. Valley Water owns fee-title with only easements under the bridge crossings.



Reach 4 – Hillview Drive to Calaveras Boulevard



Reach 4 – Looking upstream from Hillview

APPENDIX G Berryessa Creek (continued)

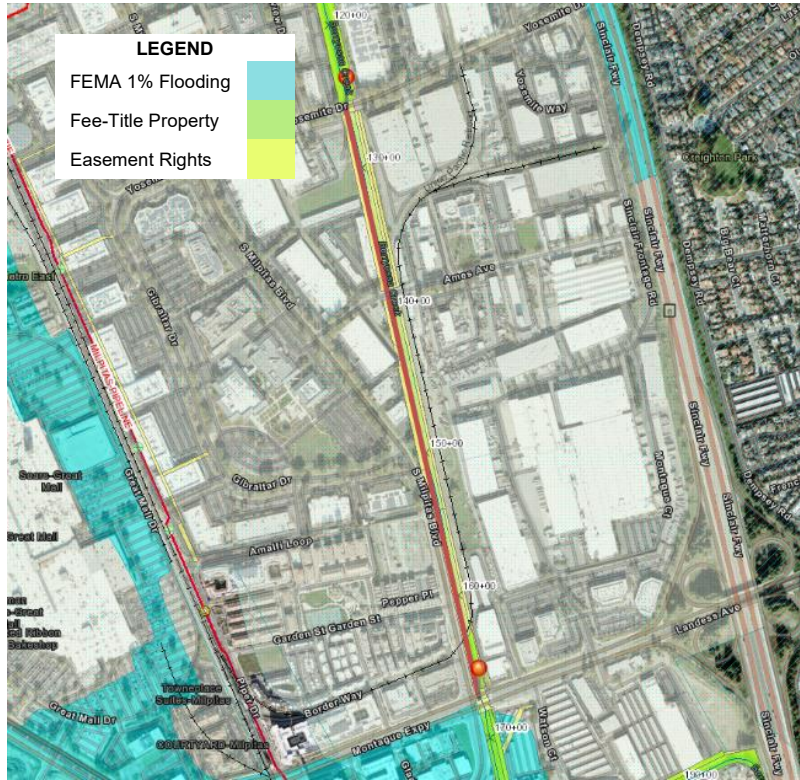
- e. **Reach 5 – Calaveras Boulevard to Yosemite Drive.** Reach 5 is a 3,900-foot-long straight trapezoidal earthen channel with maintenance roads on both banks. Los Coches Creek confluence is about 630 feet upstream of Calaveras Boulevard and Piedmont Creek confluence is another 2,160 feet upstream. Most of the adjacent land is industrialized. Valley Water owns fee-title in the creek.



Reach 5 – Looking downstream from Los Coches Street toward Calaveras Boulevard

APPENDIX G
Berryessa Creek (continued)

- f. **Reach 6 – Yosemite Drive to Montague Expressway.** This reach is about 4,120 feet in length and is a trapezoidal earth channel flowing through industrialized areas with maintenance roads on both banks. Union Pacific Railroad (UPRR) crosses the creek about 400 feet downstream of Montague Expressway. Valley Water owns easement property rights for all of the creek except for a short section of fee-title between the UPRR crossing and Montague Expressway.



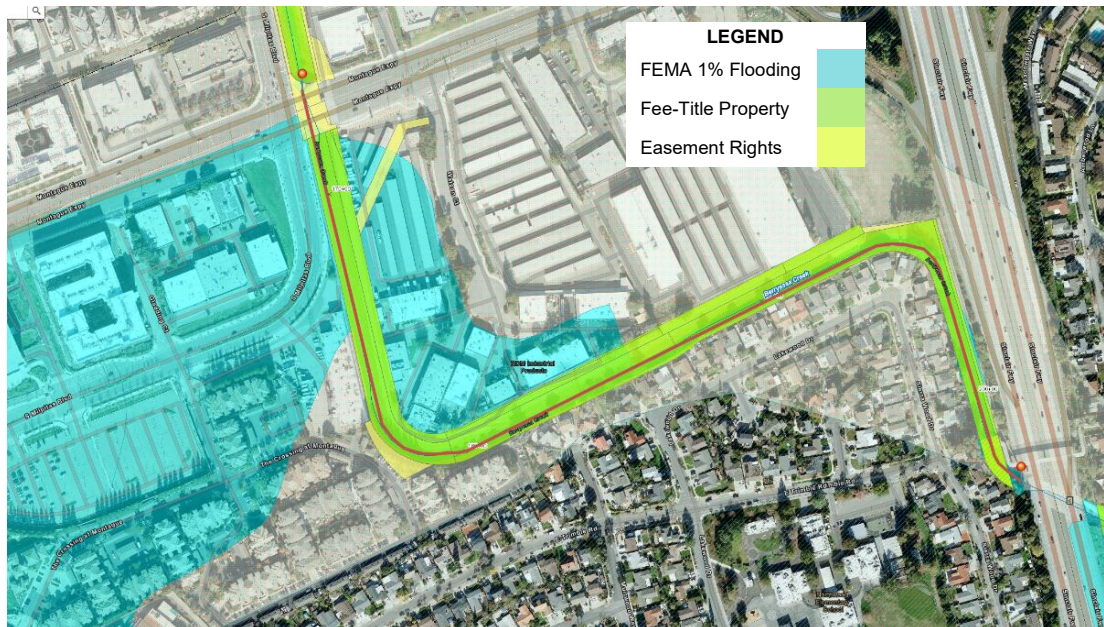
Reach 6 – Looking upstream from Yosemite Drive

APPENDIX G Berryessa Creek (continued)



Reach 6 – Looking downstream at UPRR crossing

- g. Reach 7 – Montague Expwy to Interstate 680.** Reach 7 is an excavated earth channel about 2,000 feet in length. There are maintenance roads on both banks. City of San José city limits starts 2,000 feet upstream in this reach and much of that area is along residential properties. There is a City pedestrian crossing just downstream of I-680. Valley Water owns the creek in fee-title.



APPENDIX G
Berryessa Creek (continued)



Reach 7 – Looking upstream from Montague Expressway



Reach 7 – Looking upstream at I-280 crossing

APPENDIX G
Berryessa Creek (continued)

- h. Reach 8 – Interstate 680 to Cropley Avenue.** This reach is a concrete-lined trapezoidal channel about 2,000-feet long along residential areas. There are maintenance roads on both banks with no maintenance access under I-680. Valley Water owns the creek in fee-title and has no rights under I-680 or Cropley Avenue.



Reach 8 – Looking downstream from Cropley Avenue

APPENDIX G
Berryessa Creek (continued)

- i. **Reach 9 – Cropley Avenue to Morrill Avenue.** This 1,000-foot-long reach is an excavated earth channel in residential areas with maintenance roads on both banks. There is an energy dissipator at the entrance to the Cropley Avenue culvert. There is a 50-foot section of U-frame concrete channel downstream of Morrill Avenue. Valley Water owns mostly fee-title with no rights under Morrill Avenue.



Reach 9 – Looking at Cropley Avenue culvert entrance

APPENDIX G
Berryessa Creek (continued)



Reach 9 – Looking downstream from Morrill Avenue at concrete transition to excavated earth channel

- j. **Reach 10 – Morrill Avenue to Grade Control.** This reach is about 550 feet in length with small levees and maintenance roads on both banks. It is a U-frame concrete channel for about 150 feet to the Sierra Creek confluence where there is an energy dissipater structure just upstream. The next 400 feet of the reach is an excavated earthen channel with a grade control structure at its upstream limit. Valley Water owns fee-title in this reach.



APPENDIX G
Berryessa Creek (continued)



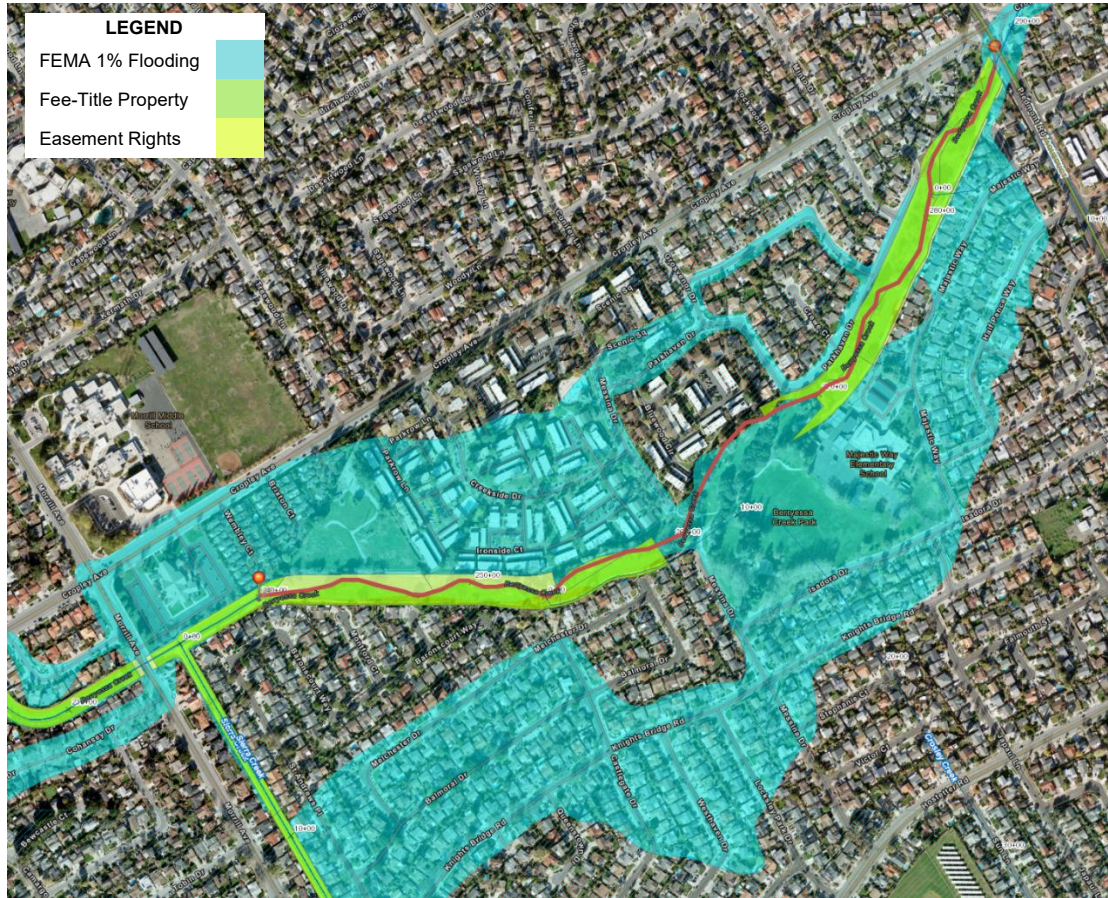
Reach 10 – Looking upstream from Morrill



Reach 10 – Looking upstream at Sierra Creek confluence (left picture) and at Grade Control Structure (right picture)

APPENDIX G
Berryessa Creek (continued)

- k. **Reach 11 – Grade Control Structure to Piedmont Road.** This 4,700-foot-long reach is a vegetated earth channel with some sections of levee. There is a short section of maintenance road on the north bank near the downstream grade control structure and a short section near Piedmont Road. The south bank maintenance road continues in most of the reach except where there is no Valley Water right of way in Berryessa Creek Park. A levee on south side of creek in Berryessa Creek Park protects Majestic Elementary School. Valley Water has a visual stream gauge just downstream of a pedestrian bridge near Messina Drive. Valley Water owns fee-title or easement in this reach except no rights in the park.



APPENDIX G
Berryessa Creek (continued)



Reach 11 – Looking upstream of Messina Drive at the levee



Reach 11 – Visual stream gauge downstream of Messina Drive pedestrian bridge in Berryessa Creek Park

APPENDIX G
Berryessa Creek (continued)



Reach 11 – Messina Drive pedestrian bridge



Reach 11 – Looking downstream of Messina Drive at levee on north side of creek

APPENDIX G
Berryessa Creek (continued)



Reach 11 – Looking downstream of Piedmont Road at earthen channel beginning of heavily vegetated area. About 600 feet upstream of Sweigert Creek confluence.

- I. Reach 12 – Piedmont Road to Old Piedmont Road.** This 1,100-foot-long excavated earth channel includes a 400-foot culvert under the Piedmont Road and Cropley Avenue intersection. A maintenance road is on the southerly bank. There is an ALERT stream gauge upstream of the culvert. Valley Water owns mostly fee-title right except for the culvert.



APPENDIX G
Berryessa Creek (continued)



Reach 12 – Looking from downstream of Piedmont Road at exit of approximately 400-foot culvert that crosses under Cropley Road and Piedmont Road.



Reach 12 – Upstream Cropley Road entrance to the 400-foot culvert with visual gauge and web cam

APPENDIX G
Berryessa Creek (continued)



Reach 12 – Looking upstream at the Old Piedmont Road culvert and drop/grade control structure with ALERT stream gauge

C. BERRYESSA CREEK FLOOD THREAT. Berryessa Creek has flooded numerous times in the past with recent flooding occurring in 1998 and one of the most significant occurring in January 1983. The 1983 flood was highest peak flow ever recorded upstream of Calaveras Boulevard at an estimated 1,045 cfs.

During the 1983 event, the creek overtopped from upstream of Old Piedmont Road to the Piedmont Road/Cropley Avenue culvert in the City of San José causing damage to four homes and damaging property and vehicles in the residential area. It also overtopped upstream and downstream of Montague Expressway and between Yosemite Drive and Calaveras Boulevard in Milpitas damaging at least six businesses in the commercial/ industrial area. That overtopping in Milpitas continued overland westerly flooding streets and parking lots in the vicinity of Abel Street and Marylinn Street. The floodwaters also contained a significant amount of sediment required extensive cleanup. And Valley Water crews had to remove over 15,500 cubic yards of sediment from the creek channel in the month following the storm to restore channel capacity for the remainder of the storm season.

In response to the significant threat of flooding, 1% flood protection improvement projects have been completed or are planned to be completed by Valley Water and the US Army Corps of Engineers (COE). These projects are:

- Berryessa Creek from Lower Penitencia Creek to Abel Street completed in 2016 by Valley Water,
- Berryessa Creek from Abel Street to Calaveras Boulevard completed in 2020 by Valley Water,
- Berryessa Creek from Calaveras Boulevard to I-680 completed in 2017 by COE,
- Lower Penitencia Creek from Coyote Creek confluence to Berryessa Creek completed in 2023 by Valley Water,

APPENDIX G
Berryessa Creek (continued)

- Lower Calera Creek completed in 2023 by Valley Water, and
- Tularcitos Creek has not yet been started by Valley Water.

The expected 1% flow used for design purposes varies from about 4,700 cfs just upstream of Calaveras Boulevard to 1,430 cfs just upstream of Sweigert Creek confluence near Piedmont Road. However, current channel capacities in the reach upstream of I-680 area as low as 1,000 cfs upstream of Morrill Avenue. FEMA estimates that during a 1% event over 1,680 acres could flood ([Figure 1G](#)). Much of the flooding just upstream of Calaveras Boulevard that flowed westerly in the City of Milpitas and commingled with floodwaters from Lower Penitencia Creek should be removed by the flood protection projects. These FEMA flood areas should be removed from maps by 2024. Other flooding, however, would continue to be shown to have a 1% chance to occur upstream of I-680 and impact mostly residential areas in the City of San Jose.

In addition to flooding from high flows that are included in FEMA flood maps, unforeseen events pose risks in all reaches. Attachment 12 describes some unforeseen events that may necessitate a change in readiness level.

APPENDIX G
Berryessa Creek (continued)

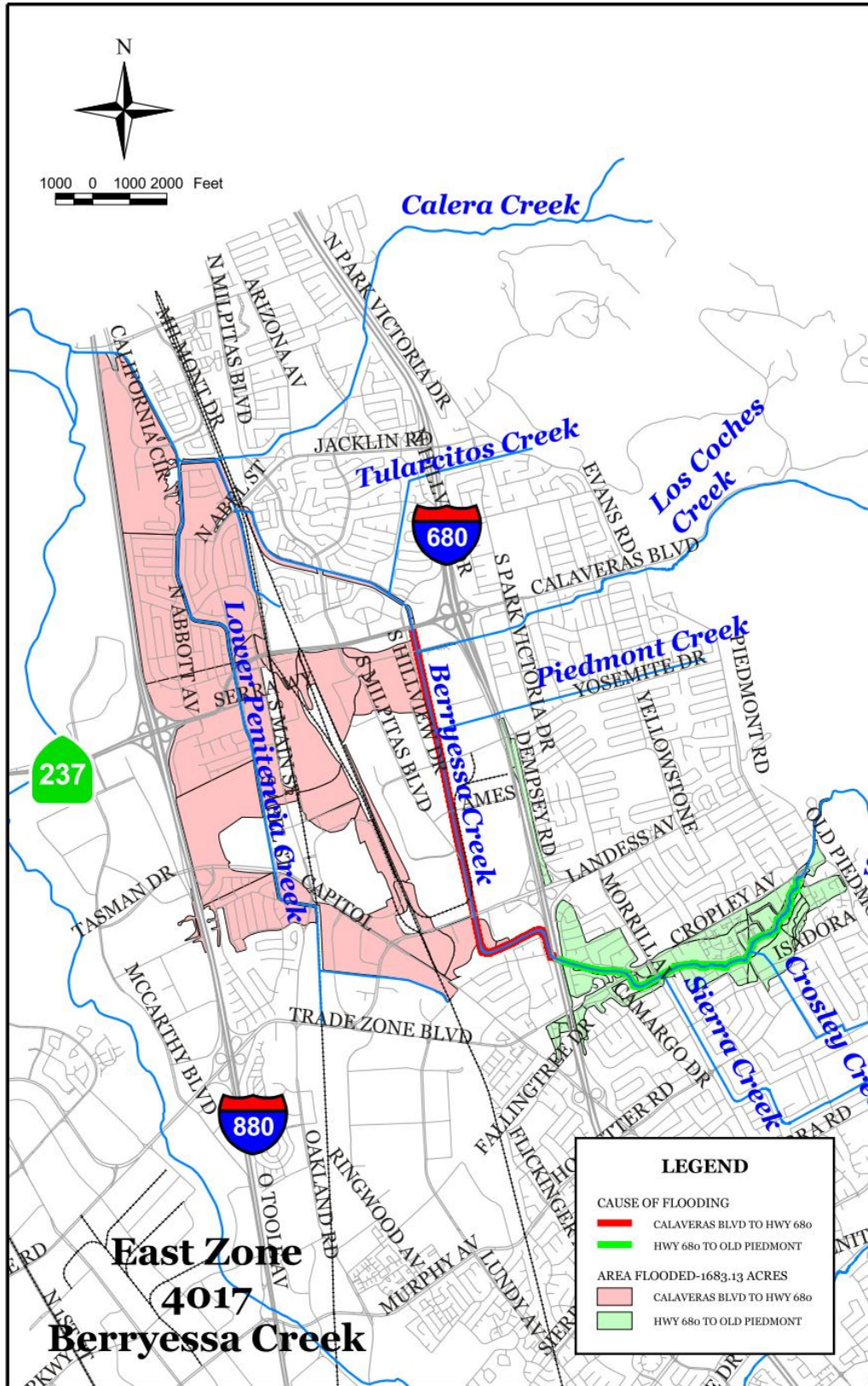


FIGURE 1G
Berryessa Creek FEMA Floodplain

APPENDIX G
Berryessa Creek (continued)

D. FLOOD EVENT DETECTION. There are several detection methods that are described in the EAP that include weather forecasts, hydrologic/hydraulic modeling, Automated Local Evaluation in Real Time (ALERT) stream/reservoir/precipitation gauge systems, and field observation of stage gauges and other areas of high flow. Some of these are available through websites that are listed in Attachment 2.

- 1. WEATHER FORECASTS.** The National Weather Service (NWS) provides weather (e.g., precipitation) forecasts in advance of storm events. Valley Water also contracts with a service provider for enhanced forecasting in the regional area.

During storm events, the NWS will host webinars with affected agencies and utilities to discuss forecasts and share information to enhance regional preparedness. The Valley Water and Agency Stakeholders can participate in these webinars and share all current information. In addition, the NWS maintains websites (Attachment 2) that provide flood threat information and they will issue public notices of forecasted flood threats on local television and radio programming if the level of threat is high.

- 2. HYDROLOGIC/HYDRAULIC MODELING.** Based on the weather forecast and other real-time data, Valley Water may utilize computer modeling to predict flood stage up to 72 hours in advance. These models are not run operationally and are performed on an ad hoc basis. Outputs are considered estimates and can vary, sometimes significantly, from the actual flood flows. Berryessa Creek is generally considered to have flashy flow and computer modeling to predict flooding far in advance of a storm event may have little benefit.

Modeling is also used to improve ALERT gauge data and refine flood thresholds. To improve the accuracy of the modeling, Valley Water will review the computer model periodically and determine if additional information can be gathered to update the model. The type of information that can be used to update the models include: surveys of channel geometry, reevaluation of channel roughness due to vegetation or blockages, and data gathered during high flow events. The most up to date flood thresholds and forecast information for ALERT gauges can be viewed at <https://alert.valleywater.org/map?p=map&disc=f>.

Valley Water and NWS will utilize this modeling to help set their flood readiness level for Berryessa Creek ([Table 1G](#)) and provide the information to local agencies and the public as appropriate. And this same modeling and information that helps determine flood readiness levels is used by Valley Water in determining flood severity levels for Berryessa Creek ([Table 2G](#) and [3G](#)) during storm events.

- 3. GAUGE SYSTEM.** There are ALERT stream gauges on Berryessa Creek at Calaveras Boulevard and at Old Piedmont Road. These gauges provide data in near real-time at the two locations on Berryessa Creek, however, none of the tributaries have gauges. The gauge at Old Piedmont Road also includes a table of the most current flood thresholds. A listing of all ALERT gauges in the Berryessa Watershed can be found on the Valley Water Surface Water Data Portal at <https://alert.valleywater.org/map?p=map>.

APPENDIX G Berryessa Creek (continued)

The following is a summary of the current stream gauge program.

1. Annually sites will be prioritized for manual gauging and teams are assigned.
2. After every high flow event, the rule curves (depth versus discharge) are updated/calibrated.
3. The most current flood thresholds and forecast information for ALERT stream gauges is available at the Valley Water Surface Data Portal: <https://alert.valleywater.org/map?p=map>.
4. **VISUAL OBSERVATIONS.** Visual observations can be critical to verify what is occurring because ALERT gauges are not always a reliable source of information and modeling information can vary from the actual condition. In addition, there are other known hot-spots and facilities that should be visually checked during high flows. Supplementing with visual observations by viewing real-time images from WebCams (Valley Water Surface Water Data Portal: <http://alert.valleywater.org>), staff deployed in the field (i.e., Field Information Teams), and other field reporting is an important component to detection.

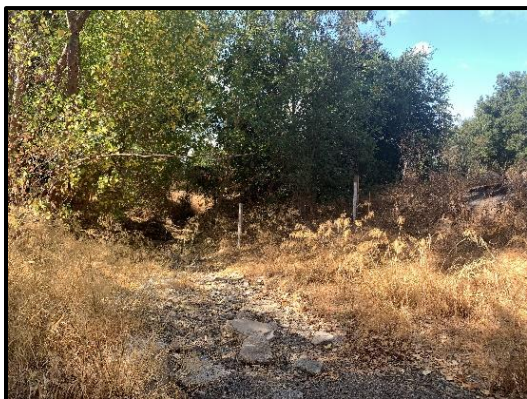
To allow additional information to be accurately gathered, several visual stream stage monitoring locations have been installed for observations. These are located at:

Upstream crossing of Cropley Avenue

- Check upstream of Cropley Avenue near Piedmont Road for high water and any blockages.
- Check depth on visual stream gauge.

Morrill Avenue to Majestic Way Elementary School

- Check for high water and any downed trees causing blockage.
- Take reading from visual stream gauge (see photos below) near Messina Drive pedestrian bridge just downstream of pedestrian bridge.
- Check grade control/energy dissipaters structures upstream of Morrill Avenue.



APPENDIX G Berryessa Creek (continued)

Valley Water operates Field Information Teams (FITs) that are assigned to specific locations during storms and high flow events to provide this valuable information. In addition, the City Stakeholders may also deploy FIT teams to assure that all critical locations are being monitored. Locations of FIT deployment by the City Stakeholders and Valley Water may overlap during storm and flood events. The EOC and/or MAC Group should coordinate this effort through the Planning/Intelligence Section so that resources are most effectively utilized and information is shared.

In addition, the public may be helpful in reporting situations that may pose a flood threat. These are typically reported to Valley Water, City Stakeholders or other Agency Stakeholders who should promptly relay to the DOC/EOC or to Valley Water through a contact method shown below:

- Main Valley Water telephone: (408) 265-2600
- Valley Water after hours telephone: (408) 395-9309
- Valley Water Watershed Hotline: (408) 630-2378
- Valley Water website report problems: <https://www.valleywater.org/> or <https://access.valleywater.org/s/>
- Non-Emergency Police & Fire dispatch: 311
- Emergency Police & Fire dispatch: 911

All together the intent of these observations is to cover the following:

1. Visual stream gauges – check for high water and rate of change
2. Known Flood Hot-Spots
3. Real-time Flooding – report and document flooding
4. Bridge Piers – check for debris blockages
5. Trash Racks – check for debris blockages
6. Levees and Floodwalls – check for damage and stability
7. Sandbag sites – check for supply and access issues
8. Previously repaired or other project sites – check for performance
9. Bank Stability – check for threats to adjacent land uses

E. BERRYESSA CREEK FLOOD READINESS LEVELS AND SEVERITY. Sometimes an event is a flash flood that occurs suddenly without much early notice. However, with weather forecasting and modeling there is often an ability to estimate flood events before they occur. This is extremely valuable when preparing for necessary evacuations and road closures, however, this information should be used as guidance only and not with absolute certainty.

To provide this advanced notice, a readiness level will be used to provide an indicator of preparedness for a response and a level of potential severity for areas subject to flooding to assist the Agency's in planning and implementing appropriate actions. Because of the uncertainties of modeling in the future, a level of Watch will be used when flood stage is estimated about 24 to 48 hours or more in the future. If flooding is estimated within about 24 hours, the level will be elevated to Warning. In addition, an unexpected situation may occur during high flows that may result in a change in readiness level (Attachment 12 – Guidance Table for Evaluating Facility During High Flow and Determining Readiness Level).

APPENDIX G
Berryessa Creek (continued)

TABLE 1G
Flood Readiness Levels

PREPAREDNESS	<p>This is the base stage of readiness that will be the typical condition throughout most of the year. Preparedness is defined as:</p> <ul style="list-style-type: none"> • Flood stage (Minor Flooding or greater) is not estimated within the next 72 hours or • Measured stream depth is below 50% of flood stage.
MONITORING	<p>This condition is variable and requires more intense monitoring and a heightened level of alertness. A portion of the Emergency Management Organization (EMO) may be active to monitor for any developing flood concern. Monitoring is defined as:</p> <ul style="list-style-type: none"> • Flood stage may occur in 48 to 72 hours, or • Measured stream depth is at 50% to 70% of flood stage, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or near design stage within 24 hours.
WATCH	<p>Flood level or a serious flood threat is expected to occur. Multiple portions of the EMO may be activated at an appropriate level. Watch is defined as:</p> <ul style="list-style-type: none"> • Stream depth is estimated to reach flood stage or greater within 24 to 48 hours, or • Measured stream depths are at 70% to 100% of flood stage, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater than design stage within 6-12 hours.
WARNING	<p>This is a more urgent situation with flooding imminent or occurring. The EMO is more completely active. Warning is defined as:</p> <ul style="list-style-type: none"> • Flood stage or greater is occurring or is estimated to occur within 24 hours, or • For areas that are controlled purely by storm drain runoff (flashy systems), the stream depth is estimated to reach flood stage or greater within minutes/hours or is occurring.
<p>Note: Flood stage is the depth of water at which a stream or facility begins flooding (see Glossary of Terms).</p>	

When the level is at a Watch or Warning, there is an expectation that flooding will occur or is occurring at some locations. The severity of the situation at specific locations is determined by the flood stage. The areas subject to flooding for different stream stages are estimated utilizing hydraulic models and flood maps. Flood severity categories are defined by this EAP are consistent with those of the NWS and [Table 2G](#) and [Table 3G](#) below show the information as of the date of this EAP. The most current information regarding flood severity and flood thresholds is available at <https://alert.valleywater.org/map?p=map>.



APPENDIX G
Berryessa Creek (continued)

TABLE 2G
Berryessa Creek Flood Severity Levels

Action	<p>An established gauge height which when reached by a rising stream, lake, or reservoir represents the level where action is taken in preparation for possible significant hydrologic activity.</p> <ul style="list-style-type: none"> • Berryessa Creek <ul style="list-style-type: none"> ○ Old Piedmont Road gauge is at or near 11 feet. <ul style="list-style-type: none"> ▪ Water at Cropley Avenue culver soffit likely due to heavy sedimentation.
Minor Flooding	<p>Minimal or no property damage, but possibly some public threat (e.g., inundation of roads).</p> <ul style="list-style-type: none"> • Berryessa Creek <ul style="list-style-type: none"> ○ Old Piedmont Road gauge is at or near 12 feet. <ul style="list-style-type: none"> ▪ Creek may overbank upstream of Cropley Avenue flowing down Cropley Avenue toward the west. Possible overbanking at and around Berryessa Creek Park near Messina Drive, Majestic Way Elementary School, and homes on Creekside Drive. ○ Calaveras Boulevard gauge is at or near 13 feet. <ul style="list-style-type: none"> ▪ Possible overtopping from Highway 237 to Ames Avenue.
Moderate Flooding	<p>Some inundation of structures and roads near stream, evacuations of people and/or transfer of property to higher elevations.</p> <ul style="list-style-type: none"> • Berryessa Creek and Tributaries <ul style="list-style-type: none"> ○ Old Piedmont Road gauge is near or greater than 13.0 feet. <ul style="list-style-type: none"> ▪ Extremely high runoff from the hills suggests widespread flooding on tributaries such as Wrigley Ford Creek and Sierra Creek. Street flooding likely, with overland flow ponding towards I-680 and Cropley Avenue.
<p>Disclaimer: This table is current as of the publishing of this document. The most current flood severity thresholds are at https://alert.valleywater.org/map?p=map.</p>	

**APPENDIX G
Berryessa Creek (continued)**

**TABLE 3G
Berryessa Creek On-Site Monitoring Thresholds**

ID #	MONITORING LOCATION	FLOODING DESCRIPTION	FLOOD READINESS STAGE AT MONITORING LOCATION			PHOTO
			50% Capacity	70% Capacity	100% Capacity	
1	Upstream Cropley Avenue	Heavy sediment loads during storms will deposit under the culvert, reducing its capacity and possibly leading to overtopping on the upstream end of the bridge. Capacity estimates vary due to sediment deposition.	n/a	n/a	9	
2	Berryessa Park downstream Messina Drive Pedestrian Bridge	Homes along the north bank of Berryessa Creek just downstream the Park will see spilling. Berryessa Creek Park may also spill.	3.5	4.5	5.5	
<p>Disclaimer: The flooding thresholds in this table are current as of the publishing of this document. They are based on hydraulic modeling results calibrated with data collected during historical flood events. Hydraulic modeling results may be preliminary and should be used for general analysis purposes. Information is accurate within the model limitations and assumptions/data used for model development. The most current flooding thresholds check are at https://alert.valleywater.org/map?p=sensor&sid=5100.1&disc=f. Use care while interpreting results.</p>						

F. ACTIVITIES AND NOTIFICATIONS. General activities and actions are described in Concept of Operations Section – Progression of Responsibilities (Table 2) and Attachments 3 through 7 of the EAP. General notifications are described in EAP Mobilization – Step 3 of the EAP. The general level of activity and notifications will be guided by the best information available to the EAP Personnel. The level of activity may mirror those activities of the individual jurisdictional Emergency Operations Centers (EOCs).

The general activities in Table 2 and Attachments 3 through 7 of the EAP sufficiently cover activities needed for Berryessa Creek.

APPENDIX G
Berryessa Creek (continued)

1. PREPAREDNESS

- For areas over which it is responsible and as it is safe to do so, Valley Water O&M will conduct field inspections of the creek for flow conveyance and the integrity of levees and floodwalls.
- For areas over which it is responsible and as it is safe to do so, Valley Water O&M will perform mitigation work on all facilities to ensure they will function prior to a storm event.
- Valley Water WFOU will inventory and procure flood fighting materials and equipment.

2. MONITOR, WATCH & WARNING

- Valley Water WFOU will inspect and clean bridge piers and culverts over which it is responsible and as it is safe to do so.
- Valley Water WFOU will stage equipment at localities likely to be affected as needed.

Berryessa Creek flows through the City of Milpitas and City of San José. Contact information for them and other Agency Stakeholders is included as Attachment 1 of the EAP.

There are important infrastructure and facilities at risk of flooding from Berryessa Creek. Based on intelligence gathered during the storm event, the EOC and other stakeholders will determine the risk and provide notifications as appropriate. In general, a City Stakeholder would provide notifications to critical facilities at risk.

Below is a list of some important facilities that may be at risk. If needed and available, more detailed flood maps may be provided to City Stakeholders by Valley Water's Hydrology, Hydraulics and Geomorphology Unit to better determine which facilities are threatened by the high flow event.

FACILITY TYPE	NAME	ADDRESS	PHONE
Schools	Majestic Way Elementary School	1855 Majestic Way San José, CA 95132	(408) 923-1925
	Morrill Middle School	1970 Morrill Avenue San José, CA 95132	(408) 923-1930
Medical	Kaiser Permanente	770 East Calaveras Blvd. Milpitas, CA	(408) 945-2640

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