



Santa Clara Valley Water District

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BOARD AGENDA MEMORANDUM

SUBJECT:

Winter Preparedness Briefing.

RECOMMENDATION:

Receive information on the Santa Clara Valley Water District's preparedness for winter operations.

SUMMARY:

As the agency responsible for local flood protection, the District works diligently to protect Santa Clara Valley residents and businesses from the devastating effects of flooding. Since the early 1980s, the District and its partners have invested approximately \$900 million in flood protection programs, including constructing major flood protection projects that have removed approximately 100,000 parcels from previously flood-prone areas. Despite these efforts, 67,000 parcels continue to be at risk of flooding during a 100-year storm event.

Over the last one year, the District has carried out several efforts to prepare for extreme weather events, respond effectively and minimize the impacts of flooding. In October 2017, the National Weather Service (NWS) recertified the District as Storm Ready. The certification is valid through October 2020.

This report provides information regarding various measures the District has taken to prepare for the Winter season. Specifically, it includes information on the following:

- Weather outlook
- Flood protection and conveyance capacity
- Public engagement
- Preparing and responding to flood emergencies
- Monitoring and flood forecasting
- Reservoir management
- Emergency management systems and response

Background

Winter Hazards

Winter brings an additional set of seasonal hazards that threaten both watersheds and water utility operations. Severe and/or extended precipitation can overwhelm engineered and natural channels and has the potential to damage District flood protection infrastructure. The resulting flooding can prompt municipalities to initiate evacuations and sheltering, and disrupt transportation. Severe storms can also bring high winds and cause landslides that have the potential to impact power, communication and water utility infrastructure.

Weather Forecast

National Weather Service (NWS) seasonal weather models predict about a 75% chance of a La Niña conditions and a 25% chance of neutral El Niño Southern Oscillation (ENSO) occurring this 2017/2018 fall-winter season. Current expectations are a near normal precipitation for the first part of the water year with a higher likelihood for drier than normal conditions for Santa Clara County January through March of 2018.

NWS forecasters will also be watching how the Pacific Decadal Oscillation (PDO) and Madden-Julian Oscillation (MJO) develop for the winter season. These, and other, seasonal oscillations could bring swings in precipitation amounts, fluctuating snow levels, and/or atmospheric rivers. Medium range forecast capabilities will help to distinguish these events with as much lead time as 10-14 days, though the details may not be worked out until within a few days of any given event. Keep in mind that a season with near normal rainfall can still produce flooding especially if much of the rainfall occurs over a short period of time.

Near-term weather forecasts enable the District to anticipate the location and intensity of rainfall to better mobilize response efforts. The District receives weather forecasts from multiple sources, including meteorology consultants and the NWS. Using this data, District staff makes decisions for flood fighting and for reservoir operations.

Climate Change

Climate change impacts challenge the District's core business. Global climate models and regional or local climate projections indicate the potential for changes in the amount, intensity, and duration of precipitation in the future. To adapt to the effects of climate change, the District has established a Climate Change Framework and team to identify impacts and ways to adapt to climate change scenarios. The District's core service area of flood protection is challenged by climate change, particularly by changes in precipitation patterns and sea-level rise. Even though some effects of climate change, such as sea-level rise will not be fully realized for decades, the long life expectancy of flood protection projects means those projects must be designed to account for likely future conditions.

Board Natural Flood Protection Ends Policies

The District Board of Directors has established Natural Flood Protection (NFP) Goals 3.1 and 3.2 to provide flood protection for residents, businesses and visitors; and to reduce the potential for flood damages. These goals establish the following five natural flood protection objectives:

- Protect parcels from flooding by applying an integrated watershed management approach that balances environmental quality and protection from flooding (Objective 3.1.1)
- Preserve flood conveyance capacity and structural integrity of stream banks, while minimizing impacts on the environment and protecting habitat values. (Objective 3.1.2)
- Promote the preservation of flood plain functions (Objective 3.2.1)
- Reduce flood risks through public engagement (Objective 3.2.2)
- Prepare and respond effectively to flood emergencies countywide to protect life and property (Objective 3.2.3)

This memorandum describes how District staff is working to achieve each of these objectives.

1. Protect Parcels from Flooding (3.1.1)

The District's Watersheds Design and Construction Division plans, manages, and implements capital improvements to comply with the Board's Ends Policy to protect parcels from flooding. A total of 15 flood protection projects are underway in Fiscal Year 2017-18 with a total FY18 budget of \$59.6 million. Five of these projects are Safe, Clean Water projects and 10 are funded by property taxes. All have the primary objective of providing natural flood protection for residents, businesses and visitors. As specified in the 5-year Capital Improvement Program, approximately 25,500 parcels will be protected and/or eligible for removal from the flood hazard zone when these projects are completed.

Temporary Barriers at Rock Springs

To prepare Coyote Creek for this winter, the District is building flood barriers in the Rock Springs neighborhood, which is one of the areas that was flooded earlier this year. District crews have constructed an earthen berm of up to 5-feet tall and 400-feet long, and are close to completing the installation of a vinyl sheet pile wall of up to 3-feet tall and 500-feet long to help prevent the intrusion of water. While these walls will not eliminate the flood risks to this area, they will help reduce the chance of flooding from a storm event as was experienced last February.

The District also replaced a damaged levee near the Golden Wheel Mobile Home Park, one of the neighborhoods also flooded last February.

2. Preserve Flood Conveyance Capacity (3.1.2)

The District's Watershed Operations and Maintenance Division performs sediment removal, levee inspection and maintenance, debris removal, vegetation management, and erosion protection and repairs to comply with the Board's Ends Policy to preserve flood conveyance capacity. These efforts have improved the channel conveyance capacities of many local streams and channels. Work that has been accomplished through the District's Stream Maintenance Program this year includes the following:

- Removal of 35,074* cubic yards of sediment
- About 3,478* linear feet of bank stabilization
- Completion of 390* acres of in-stream vegetation control over 116*miles of streams

*These are year-end estimates and will be revised once all projects have been completed and the end of the year totals are calculated

District staff continues to receive calls from throughout the county to service problematic trees plagued by disease or die off associated with the recent drought. Field crews continue to remove trees that could potentially block flows in local creeks or cause other hazards. Staff is also coordinating with owners of properties where trees have been reported as a potential issue and could pose additional blockage threats in local creeks.

3. Promote the preservation of flood plain functions (3.2.1)

The District preserves floodplain functionality and other watershed assets and interests from external land-use activities by promoting streamside setbacks through implementation and enforcement of the District's Water Resources Protection Ordinance and by participating on municipal General Plan update committees reviewing and commenting on development proposals.

The District's Community Projects Review Unit issues encroachment permits that regulate the third-party use of District lands adjacent to local waterways and acts on enforcement cases. Additionally, the District annually reviews environmental documents and plans for projects outside the District right-of-way to promote District's water resource interests. Through these processes, the District advocates the development setbacks and site layouts that strive to maximize protection of stream and riparian corridors and floodplain function.

4. Reduce flood risks through public engagement (3.2.2)

The District engages the public through its Office of External Affairs to provide flood awareness and safety messages and direct residents to resources. Additionally, through its Office of Water Resource Planning and Policy, the District works with municipal partners and the Community Rating System (CRS) to provide a direct financial benefit to the public through reduced premiums for flood insurance.

Community Rating System, National Flood Insurance Program

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities

that exceed the minimum NFIP requirements.

As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three CRS goals:

- reduce flood damage to insurable property;
- strengthen and support the insurance aspects of the NFIP; and
- encourage a comprehensive approach to floodplain management.

CRS activities that the District carries out are verified by the Federal Emergency Management Agency (FEMA) and then claimed by the participating CRS communities in Santa Clara County where those activities apply. This simplifies FEMA's CRS bookkeeping and avoids duplicating efforts. Total annual savings on flood insurance premiums are estimated to be over \$2.3 million from the 10% to 20% discount earned through the CRS program for approximately 16,000 policy holders in Santa Clara County.

The District receives CRS points for our outreach program, mapping of flood risks, open space preservation in floodplains, and maintenance and management of our creeks.

A CRS Users Group, consisting of the District and participating CRS communities, was formed in 2013. The Users Group has proven to be very useful not only for discussion of activities that earn CRS points, but also allows for dialogue of ongoing flood risk reduction efforts and related topics among all cities in the county and serves as an information sharing platform.

Public Education and Community Engagement

This winter, the District will continue to deliver flood-safety messages throughout Santa Clara County. The main public education objectives are the following:

- Convey to the general public that flooding can be a serious threat (even if you don't live in the floodplain)
- Explain what people can do to protect themselves and reduce risk to life and property
- Direct the public to appropriate District resources on valleywater.org for additional information
- Earn credit towards FEMA's Community Rating System through our Program for Public Information, which helps communities earn discounted flood insurance premium rates for residents

In early December, a targeted mailing of the annual floodplain mailer will be distributed to about 53,000 parcel-owners and residents in or near flood-prone areas. The piece provides information on flood-protection projects and flood-safety resources. The mailer is written in English, Spanish, Vietnamese and Chinese. This year, we are including a watershed-specific insert in each mailing which includes a watershed map that shows sandbag sites and 100-year FEMA flood zones.

This year we are preparing for a full-scale paid advertising campaign to launch by December and continue through the end of April of 2018. To reach diverse ethnic audiences, media messages will

be delivered through Spanish, Chinese and Vietnamese media outlets. The campaign may be further expanded if the winter turns out to be particularly wet.

During the winter months, the District will convey flood preparedness messages through a selected range of communications platforms including radio spots, newspaper ads, online ads, social media and web videos. The focus of the District's flood awareness outreach is to inform the community of flooding hazards in the county and to provide information on what community members can do to protect their family and property before, during and after a potential flooding event. Flood-safety tips and messages will also be heard by callers to the District when placed on hold.

This fall we participated in 16 community events to distribute flood-preparation materials and answer questions about flood safety. We have chosen events that are in areas most prone to flooding. These include parts of South County in Morgan Hill and Gilroy, as well as vulnerable areas in San Jose, including along Senter Road, across from the Rock Springs neighborhood. District staff has pursued partnership opportunities with local community-based organizations in cities with flood-prone areas to identify opportunities for outreach. This outreach was added to our annual outreach effort to foster a more direct, grassroots connection to communities at risk of flooding. We have also made sure to incorporate flood safety materials during the fall months for all community events in which the district has sponsored a booth.

Through our outreach, we are also promoting Santa Clara County's AlertSCC emergency notification system and their ReadySCC app. AlertSCC is a free, easy, and confidential way for anyone who lives or works in Santa Clara County to get emergency warnings sent directly to their cell phone, mobile device, e-mail, or landline. It is one of the most effective ways for local jurisdictions to communicate flood hazards and evacuation orders, but it requires residents to opt into the system. The ReadySCC App allows residents to prepare a family emergency plan with five simple questions, send status updates to contacts, receive advisories and alerts via push notifications, and includes a detailed guide with step-by-step instructions for creating an emergency kit. As an incentive to download ReadySCC, residents who download the app receive a free emergency starter kit. These kits were first introduced to the community last year and include basic supplies such as a hand-operated flashlight, mylar blanket, rain poncho, safety whistle, gloves and glow stick. While these kits are basic and serve to encourage residents to begin preparedness on a larger scale. Residents who do not have a mobile phone are encouraged to fill out emergency contact cards to receive their kit.

The District website serves as a one-stop shop for flood-related information, including emergency updates, flood safety tips and information on sandbag sites, stream and reservoir gauges in the county, as well as links to the National Weather Service, County Office of Emergency Services; and FEMA'S preparedness site, Ready.gov. Social media and online publications through our news website, valleywaternews.org <<https://valleywaternews.org/>>, will continue to be utilized to provide registered recipients with timely and immediate flood-hazard messages.

In the wake of the February 2017 flooding, the District is committed to continually improving strategies for effective flood safety messaging.

5. Prepare and Respond Effectively to Flood Emergencies (3.2.3)

Despite all the proactive efforts to remove parcels from flood hazard zones, maintain channel

conveyance capacities and floodplain function, and engage the public with flood awareness and safety messages, floods still can and do occur - usually with little warning and sometimes with potentially devastating effects.

Flood emergency preparedness entails the combined efforts of many units of the District, notably Emergency and Security Services, Field Operations, Water Supply Operations and Planning, Hydrology and Hydraulics, Communications, Government Relations, the Clerk of the Board Office and other units that contribute staff that are trained to participate in roles assigned in the field, Departmental Operation Centers (DOC), and within the Emergency Operations Center (EOC).

To ensure that the District is in the best possible state of readiness to address flooding when it does occur, the District maintains tools, processes, trained staff and interagency relationships that enable coordinated field response and public information.

Emergency Action Planning

Emergency Action Plans (EAPs) are documents that identify potential emergency conditions at facilities, such as creeks, and specifies actions to be followed to minimize loss of life and property damage. These documents include:

- Actions taken to moderate or alleviate a problem
- Actions, in coordination with emergency management authorities, to respond to incidents or emergencies
- Procedures to follow and warning and notification messages for responsible downstream emergency management authorities
- Inundation maps to help emergency management authorities identify critical infrastructure and population-at-risk sites that may require protective measures, warning, and evacuation planning
- Delineation of the responsibilities of all those involved in managing an incident or emergency and how the responsibilities should be coordinated

The EAPs are created following the guidance from the Federal Emergency Management Agency federal guidelines for emergency action planning for dams (FEMA Publication No. P-64). As well, EAPs also incorporate the guidance of the Federal Energy Regulatory Commission's Chapter 6 Emergency Action Plans of the Engineering Guidelines for the Evaluation of Hydropower Projects.

The most recent of these plans is the joint Coyote EAP developed in coordination with the City of San José, following the February 2017 flooding along sections of Coyote Creek. The joint EAP was adopted by the San José City Council and the District Board in November 2017.

Monitoring and Flood Forecasting

The District forecasts incoming weather systems based on weather reports received from multiple sources including the National Weather Service (NWS) and media sources such as Fox Weather.

In addition, the District augments standard weather reports with detailed quantitative precipitation forecasts (QPFs) from several sources, leveraging knowledge from private meteorologists, academia, and the NWS, to get a picture of a storm event. These QPFs include details such as the amount, duration, location, and timing of storm patterns.

For real-time monitoring, as the rain and flood events unfold, the District operates more than 100 precipitation, reservoir level, and stream gauges, including 85 stream flow gauges, 10 reservoir gauges and 47 precipitation stations. All of the District stream and rain gauges are regularly maintained and calibrated. This year, the District installed an “X-band” radar unit on top of the rooftop of the Penitencia Water Treatment Plant. The unit is part of the Bay area AQPI (Advanced Quantitative Precipitation Information) system. The short range and lower elevation radar supplements our existing rainfall gauge system and provides more precise rainfall data in real time.

In addition, under the District’s Safe, Clean Water Program Priority C Project, Emergency Response Upgrades Project, the District is running an experimental flood forecast and warning system, using automated hydrologic and hydraulic models to determine creek runoff and expected reservoir levels. The models ingest data from both the QPFs and monitoring sensors mentioned earlier. As the back-end modeling system and front-end user interface are perfected, additional forecast points and features can be added to provide intelligence to decision makers, emergency responders, and the general public.

Reservoir Management

The District operates 10 surface water reservoirs throughout the county. The District reservoirs are operated primarily as water supply facilities that provide incidental flood protection, environmental and recreational benefits. Many reservoirs are operated to flood risk reduction rule curves. The volume of water above the flood management rule curve may be released if it is safe to do so, to create additional storage in the reservoir and to reduce flood potential. The curves maximize water supply benefit and minimize flood risk with a high probability of the water being recovered by the end of the season. For the 2017/2018 winter season, because of the improved water supply resulting from last winter’s above-average precipitation, the Board has directed staff to operate Anderson and Coyote Reservoirs at a lower combined level this year than in past years, which will further reduce the risk of flooding downstream.

The following is a checklist of activities performed by Raw Water Operations/Field Operations staff before a reservoir flood release is initiated;

- Check weather forecast (estimate rainfall runoff)
- Check stream flow
- Check for National Weather Service Advisories/Watches/Warnings
- Coordinate with Watershed Operations (identify any existing blockages or restrictions downstream)
- Notify residents and agencies on creek contacts list

Real-time Information, Alerts and Warnings

The District provides precipitation and stream gauge data to the public via its website and this year the District launched a new flood watch website <<https://gis.valleywater.org/SCVWDFloodWatch/>> that utilizes a user-friendly interactive map to allow residents to monitor levels in their own neighborhoods.

The District website also provides access to weather forecasts, reservoir levels, precipitation, and flood-safety measures through its Weather/Hydrologic Assessment and Strategic Update Plan (WHASUP) that, beginning in November, is issued twice per week or more frequently as needed throughout the winter. The public can sign up to receive automatic emails when WHASUP information is updated. The District also promotes the County's emergency alert system [AlertSCC](https://www.sccgov.org/sites/alertscc/Pages/home.aspx) <<https://www.sccgov.org/sites/alertscc/Pages/home.aspx>> as well the [ReadySCC](http://appshopper.com/reference/readyscc-santa-clara-county) <<http://appshopper.com/reference/readyscc-santa-clara-county>>.

District, Countywide and Regional Emergency Management Systems

The District maintains facilities, equipment, procedures, trained staff and inter-agency relationships that enable it to respond to floods and other emergencies. District emergency management facilities include its Districtwide Emergency Operations Center (EOC) and Water Utility and Watersheds Departmental Operations Centers (DOCs). The District maintains a dedicated, primary EOC that is equipped with both high and low-tech communication and information storage and display technologies to allow the enable EOC functions to perform under all hazard scenarios. EOC equipment is regularly inventoried, maintained and tested to ensure readiness. District DOCs facilities are equipped for emergencies that can be handled within departmental resources and capabilities. The District maintains its Emergency Operations Plan and EOC Activation Guides within the District's Quality and Environmental Management System (QEMS). Position-specific checklists are available within the EOC to help guide EOC staff in the performance of their Standardized Emergency Management System (SEMS) response functions.

Over the last year, select District EOC response staff have participated in internal and multi-agency exercises. Exercises are designed to develop, learn, and test response capabilities under various hazard scenarios.

12/07/16	San Francisquito Creek Workshop and Tabletop Exercise (TTX)
02/07/17	San Francisquito Creek Levee Activation
02/09/17	San Francisquito Creek HWY 101 Activation
02/20/17	Coyote Creek Flood Event Activation
03/01/17	Llagas-Chual Spur Potential Landslide Activation
April 2017-Present	Development of a Joint Coyote Creek EAP
09/14/17-09/15/17	SCC Operational Area-Wide Exercise
09/21/17	Joint Coyote Creek EAP TTX

These exercises enabled staff to practice and identify areas of improvement for the operational coordination, operational communication, situational awareness, public information and warning,

and infrastructure system core capabilities as defined by the National Response Framework.

Each fall, the District Emergency and Security Unit hosts a multi-jurisdictional Winter Emergency Operations and Preparedness Workshop. This year's event was held on Oct. 26, 2017. Attendees included emergency managers and public works representatives from all 15 cities within the county, the County, and other local and state agencies. District staff reviewed the following topics during the workshop:

- Flood priority inspection locations (flooding hot spots)
- Real-time online resources for stream/reservoir/precipitation data
- Dam operations during the winter (flood rule curves, seismic stability operating restrictions)
- Coordination of District flood fighting resources (levee repair, debris blockages, and sand bagging)

The following made presentations on resource support:

- California Department of Water Resources (DWR)
- California Conservation Corps (CCC)
- CAL FIRE
- NWS
- Santa Clara County Office of Emergency Services (SCC OES)
- City of San José (CSJ OEM)

In addition to the Winter Preparedness Workshop, District emergency management staff, senior executives and elected officials foster strong interagency emergency preparedness relationships by participating in several important groups including the Santa Clara County Emergency Managers Association, the Santa Clara County Operational Area Signatories, and the Santa Clara County Emergency Operational Area Council.

District Field Response Actions and Capabilities

During a flood event the District can mobilize a field response that includes:

- maintaining a watersheds 24/7 hotline;
- deploying Field Information Teams (FIT); and
- maintaining a list of known flooding hotspots to expedite on-site arrival of resources and crews that are able to remove blockages, deploy sandbags and perform other functions to maximize flood conveyance capacity during a storm.

The District provides filled sandbags to 5 sites throughout Santa Clara County. Typically for winter seasons with average rainfall forecasts, the District stocks 20,000 filled sandbags to these locations by the end of October, restocking those sites with up to 40,000 filled bags as needed. When all the filled sandbags have been used, the District will then supply empty bags and sand at those locations.

Additionally, the District provides empty sandbags to municipal and county public works

departments to stock an additional 19 sites around the County. Empty sandbags are offered to county public works agencies beginning October 1.

Maps of sandbag locations have been prepared in conjunction with other entities. The site locations are provided through the following link:

[<http://valleywater.org/services/sandbagsites.aspx>](http://valleywater.org/services/sandbagsites.aspx)

[<http://valleywater.org/services/sandbagsites.aspx>](http://valleywater.org/services/sandbagsites.aspx).

The Morgan Hill and Palo Alto sites have webcams installed to allow residents to check on sandbag availability via the District webpage. These webcams provide the District a cost-effective way to remotely monitor the sites to replenish and provide more timely services to the residents and the county.

The District currently has 407,000 empty sandbags and 278 cubic yards of sand in storage.

The District is Certified Storm Ready

As a result of the District's efforts to protect parcels from flooding, preserve flood conveyance capacity, engage the public to reduce flood risks, and maintain capabilities to respond to storm and flood events, the District continues to be recognized by the NWS as Storm Ready. The District received the recertification in October 2017 and it is valid through October 2020.

FINANCIAL IMPACT:

Staff time was budgeted in respective programs for coordination efforts outlined in this briefing. There is no other financial impact with this item.

CEQA:

The recommended action does not constitute a project under CEQA because it does not have a potential for resulting in direct or reasonably foreseeable indirect physical change in the environment.

ATTACHMENTS:

Attachment 1: PowerPoint

UNCLASSIFIED MANAGER:

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