*City and County of San Francisco Emergency Response Plan*

# Winter Storm & Flood Annex

# A Hazard-Specific Response Plan

## Record of Changes

| Revision Date | Version # | Section of Plan Revised | Revised By |
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# Contents

# Section 1: Introduction

## 1.1 Overview

The Winter Storm and Flood Annex covers the activities involved with the emergency management of severe winter weather including both storms and extreme cold temperatures. It also includes the response to localized flooding, which can be triggered by severe storms. For the purpose of this plan, a 'severe' winter storm is defined as a weather event accompanied by wind, intense rain, or marine wave/water action of sufficient severity to threaten lives and cause damage to property, vehicles, infrastructure, vegetation and/or the coastal environment.

A brief summary of National Weather Service statistics below describes the level of precipitation, high wind and tide conditions that both individually and in some combination can lead to severe storm activity within San Francisco. It also summarizes the impact and incidence of cold temperatures in San Francisco.

**Precipitation**: Based on a one hundred year average, San Francisco receives slightly more than 21 inches of rain annually (National Climatic Data Center). However, there is a large amount of fluctuation around this average given the local climate variation between wet and dry years. For example, the El Nino winter season of 1997 – 1998 generated 47.22 inches of rainfall, while the recent drought year of 2013 – 2014 produced only 12.54 inches of rain. During extreme wet years, climatologists forecast many atmospheric river events. An atmospheric river is a long, narrow corridor of moisture in the atmosphere. When this formation occurs in the waters adjacent to the Hawaiian Islands and extends toward the Pacific coast of California, it is commonly referred to as a "Pineapple Express" storm and is associated with heavy precipitation. The wettest months for San Francisco are December through February.

There are usually only five days during the year where total rainfall is an inch or greater in San Francisco. Flood warnings are issued when storm cells with particularly heavy rain amounts, such as rainfall approaching one inch per hour, are about to move across San Francisco. These incidents may produce localized flooding. The National Weather Service anticipates that a flood warning condition will occur two to three times a year for San Francisco. Flood warnings are generally issued with short lead times.

Historically, the City and County of San Francisco (CCSF) has not experienced the type of major flooding from winter storms experienced by other Bay Area jurisdictions with river facing communities. Flooding in the City generally occurs during large rain events that surpass the collection system's design capacity, causing stormwater to accumulate on the surface particularly in low-lying areas (i.e., stormwater ponding). For instance, the El Nino winter storms of 1997-1998 and 2003-2004 did create localized flooding incidents, resulting in significant property damage and the displacement of San Francisco residents. During these large rain events, certain areas of San Francisco are more prone to flooding due to their topography. These areas are largely found on the east side of the CCSF at locations that were once historic drainage basins, particularly Mission Creek and Islais Creek. Although San Francisco no longer contains active streams, stormwater still travels on the ground surface along historic waterways

(e.g. former creekbeds) dictated by gravity and the city's hilly terrain. Moreover, greater flood risk also exists in subsiding landfill areas, such as South of Market and Bayview-Hunters Point.

**High Winds**: Sustained winds of more than 50 mph have been recorded in San Francisco during various Pacific storms with gusts peaking close to 100 mph along the coast during isolated storm incidents. Normally, the City's hilly terrain breaks up strong winds, but there are occasional strong storms with significant wind gusts that disrupt normal activity throughout the CCSF. Wind gusts at 40 mph have the potential to bring down trees and branches and cause power line damage and resulting power outages. During a December 11, 2014 major storm event, there were 80,000 homes and businesses without power at one point within the CCSF. High winds can also send waves crashing over the seawall and onto the Embarcadero roadway. Typically, at least one winter storm each year will shut down San Francisco's coastal Great Highway as wind gusts deposit large accumulations of sand on the coastal roadway.

During high wind events, the local National Weather Service (NWS) office may issue a High Wind Warning. The warning is issued when the following conditions are occurring or imminent:

- Sustained winds of 40 mph or higher for one hour, or
- Wind gusts of 58 mph or higher for one hour or more.

**King Tide**: King tide is an annual occurrence and refers to an especially high tide. It occurs when the earth, moon and sun are aligned in a manner that creates a doubly strong gravitational field and causes the ocean to rise up to new heights. Tides are enhanced when the earth is closest to the sun around January 2 of each year, yet this phenomenon can occur in consecutive winter months. At a minimum, the king tide can create dangerous conditions for boaters and beachgoers. Places around the periphery of the Bay that are very close to mean high tide are likely to get some flooding during king tide conditions. This means that in San Francisco, areas along the Embarcadero are likely to see water lapping up over the piers during king tide conditions. In a worst case scenario, significant storm activity that coincides with a king tide condition will exacerbate coastal and bayside flood conditions.

**Extreme Cold**: While winters remain mild in San Francisco (freezing winter temperatures are not at all normal for San Francisco), temperatures can drop below 40°F. Colder temperatures combined with periods of heavy rain and wind present significant health risks for people without adequate shelter. While infrequent, these unexpected temperature drops can be dangerous to more vulnerable populations living on the streets and unable to take adequate measures to protect themselves. Nighttime lows of 40°F or less, coupled with wind and/or heavy rain, can also elevate health risks for the homeless population; they can create hypothermia and cause death. See Section 4.9 Winter Weather Impact on At-Risk Populations for more details on response plans for vulnerable populations during inclement weather events.

Depending on the severity of the combined storm factors above, resulting storm impacts may include:

- Road closures, traffic diversions and public transit disruptions,

- Power outages with impacts to business continuity and critical facility operations,
- Localized flooding (flooding impacts further detailed in Section 4.7 Flood Risk),
- Coastal inundation (the flooding of normally dry, low-lying coastal land),
- Potential for evacuations from either flooding incidents or power outages,
- Possible school closures,
- Emergency sheltering for displaced persons and at-risk (i.e., homeless) populations,
- Mud or landslides (when the ground becomes over-saturated),
- Debris fields from downed trees or flood waters,
- Water rescue for coastal storm incidents,
- Inundation of storm related calls to 3-1-1 and 9-1-1,
- Emergency commodity distribution for residents sheltering-in-place (depending on infrastructure impacts), and/or
- Activation of local assistance centers (depending on recovery needs).

## 1.2 Purpose

The Winter Storm and Flood Plan is an annex to the CCSF Emergency Response Plan (ERP). This Plan is focused on the CCSF response to hazardous winter weather events.

This plan was developed to:

- Describe the roles and responsibilities of CCSF Departments and community partners in responding to winter weather, especially winter storm events.
- Explain the storm response roles of Branches within the Operations Support Section of the CCSF Emergency Operations Center (EOC).
- Provide an overview of flood risk within the CCSF including both response activities and an identification of areas within the CCSF at greater flood risk (based on historical data).
- Explain the management and coordination required for the establishment of pop-up shelters and care for homeless persons during winter storm and extreme cold events.

## 1.3 Scope

The annex describes the actions taken by CCSF Departments in response to specific winter weather hazards that includes winter storms, flooding, and/or extreme cold temperatures.

Most of the attention is placed on the response to severe winter storms given their larger citywide impact and their greater frequency when compared to incidents of localized flooding and extreme cold temperatures.

## 1.4 Applicable Plans, Authorities, and Guidance

The following are applicable plans, authorities, and guidance documents that are relevant to the CCSF Winter Storm Plan

Local Level

- CCSF Emergency Response Plan (ERP)
- CCSF Hazard Mitigation Response Plan, June 2014

Regional Level

- Bay Area Regional Emergency Coordination Plan (RECP)

State

- California Emergency Services Act (G.C. §§ 8550–8660)
- State of California Emergency Plan (G.C. § 8560)
- Standardized Emergency Management System (SEMS)

Federal

Federal operations in support of local and State governments are governed by the following:

- Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (42 U.S.C. §§ 5121–5206 [2008])
- National Response Framework
- National Incident Management System

# Section 2: Pre-Storm Response Timeline

Over the course of an impending storm event, the National Weather Service may issue the following notifications.

- Outlooks – indicate that a hazardous weather event may develop in the near future.
- Watches – are issued when the risk of a hazardous weather or flood event has increased significantly, but its occurrence, location, and/or timing remains uncertain.
- Advisories – refer to events that are occurring, or are imminent.
- Warnings – are issued when a hazardous weather event poses an immediate threat to life and or property.

The sequence below is a recommended timeline of pre-storm actions by CCSF Departments. The actual sequence of events may vary based on the actual forecast.

| 96 Hours Prior to Storm Event | |
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| **Activity** | **Department** |
| NWS provides initial notification of upcoming storm activity (i.e., Hazardous Weather Outlook). | NWS |
| If forecast indicates significant impact (i.e., heavy rainfall), DEM Day Watch Officer to arrange conference call with the Storm Incident Management Team (IMT) at the 72 hour mark. | DEM |
| Initial preparations are made to activate pop-up storm shelters for persons on the street without shelter (homeless residents). | HSA |
| Sandbags are made available to the public. | SFPW |

| 72 Hours Prior to Storm Event | |
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| **Activity** | **Department** |
| NWS may begin to issue the following products: Flash Flood Watch, High Wind Watch, High Surf Advisory, and/or Gale Watch. | NWS |
| DEM to hold initial conference call with the Storm IMT:<br>• Review planned response actions by IMT departments based on forecast<br>• Identify possible response gaps and/or areas at high risk based on potential storm impacts<br>• Determine pre-storm situation reporting schedule and future conference call meeting schedule | DEM |

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| CCSF Departments encouraged to take the following action steps:<br>• Begin planning for increased staffing and other additional resources as needed to carry out storm operations and maintain core response functions<br>• Remind employees to check on their individual and family preparedness plans<br>• Make an initial determination on whether to activate the Department's Operation Center (DOC) to coordinate storm response activities<br>• Notify employees of any planned response activities and response roles | All |
| DEM External Affairs updates social media platforms (Website, Facebook, Twitter) and begins public messaging. | DEM |
| SFPW begins inspection of scaffolding for safety and proper securing | SFPW |
| SFPW & PUC begin pre-storm inspection and cleaning of gutters, roadways, catch basins, storm drains and sewers, and establish a regular communication/coordination schedule for the duration of the event. | SFPW & PUC |

| **48 Hours Prior to Storm Event** | |
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| **Activity** | **Department** |
| NWS to continue with updated briefings on the incoming storm system<br>• NWS assurance on storm impact is now approaching high confidence<br>• However, NWS models are indicating the exact timing of the event may vary | NWS |
| DEM holds second conference call with the Storm IMT<br>• If EOC activation is recommended, determine the EOC activation level<br>• Develop schedule for EOC operational period(s)<br>• Identify EOC staffing needs and determine EOC staffing plan | DEM |
| CCSF Departments are now doing pre-storm checks on equipment and facilities<br>• Clearing catch basins around facility properties<br>• Checking on generators and generator fuel supplies<br>• Ensuring adequate fuel supply for department response equipment and vehicles<br>• Updating employees on response plans or situation status | All |
| **More specific department actions include:** | |
| DPH to communicate with all DPH healthcare facilities to ensure they have adequate fuel, water, health supplies and an adequate staffing plan | DPH |

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| HSA to complete implementation of severe weather protocols:<br>• Confirm availability of additional emergency pop-up shelter sites to support homeless residents<br>• Confirm staffing plan for sites<br>• Confirm plan for equipping sites with cots, blankets, comfort kits, and additional porta-potties if necessary<br>• Confirm feeding plan for shelter residents | HSA |
| SFPW & PUC continue with pre-storm inspection and cleaning of catch basins, storm drains and sewers, and continue to have regular coordination calls. | SFPW & PUC |
| Port sends out messaging to tenants to prepare for storm impact. | Port |
| DEM External Affairs continues with ongoing public messaging about the storm. | DEM |
| DPH to disseminate storm/health-related information to the public and issue any necessary health precautions. | DPH |
| SFUSD to determine whether to close schools or delay opening to reduce the number of children and parents using roadways. | SFUSD |
| PG&E begins the activation of Emergency Preparedness and Operations Teams. | PG&E |

| **36 to 24 Hours Prior to Storm Event** | |
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| **Activity** | **Department** |
| NWS continues with updated briefings on the incoming storm system; timing models continue to be refined. | NWS |
| Third storm conference call with the Storm IMT:<br>• Confirm EOC staffing schedule<br>• Identify any remaining gaps or problem areas<br>• Confirm final list of departments that will activate their Department Operation Centers (DOCs) | DEM |
| HSA to finalize emergency shelter plan for homeless residents without shelter. | HSA |
| DPH Homeless Outreach Teams increase efforts to get people on the streets into emergency shelters (from 24 hours prior to storm to onset of storm). | DPH |

| 6 Hours Prior to Storm Event | |
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| **Activity** | **Department** |
| NWS to provide detailed written storm briefing specific to San Francisco for the EOC | NWS |
| Activate the CCSF EOC | DEM |
| DOCs also begin to activate | Various |
| PUC to place response field crews in pre-defined response zones | PUC |
| PG&E pre-staging of Emergency Preparedness and Operations Teams continues | PG&E |

| Storm Arrival | |
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| **Activity** | **Department** |
| NWS to continues with updated briefings on the incoming storm system | NWS |
| In general, departments are monitoring storm impact to their employees, properties/ facilities, and continuity of operations | All |
| **For specific department storm response actions see the following Section 3: Roles and Responsibilities** | All |

# Section 3: Roles and Responsibilities

**Table 3-1: Department Responsibilities for a Winter Storm Event**

| Department | Responsibility |
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| Animal Care & Control (ACC) | • Coordinate animal care and shelter activities as necessitated by the storm<br>• Help with the evacuation of animals where flooding necessitates the temporary displacement of residents and their pets<br>• Assist in the reunification of storm-displaced animals with owners |
| Controller (CON) | • Provide direction to departments on cost tracking and time tracking<br>• Prepare an initial damage estimate of public and private sector losses, in coordination with CCSF Departments<br>• Coordinate overall cost recovery efforts including the financial tracking of costs incurred by the CCSF in response to a winter storm event<br>• Manage the Finance/Administration Section of the CCSF EOC (if activation of that section becomes necessary) |
| Department of Building Inspection (DBI) | • Coordinate response activities with Public Works<br>• Inspect weakening hillsides and suspected areas, including buildings, at risk of sliding<br>• Provide damage assessment inspections of building structures and other infrastructures that receive storm-related damages<br>• Provide building permits for any work needed to repair storm related damages |
| Department of Emergency Management (DEM) | • Maintain close, ongoing coordination with the NWS to monitor the evolving weather situation and its potential impact on the CCSF<br>• Coordinate the activation and management of the Storm Incident Management Team (IMT) and convene any necessary conference calls among Storm IMT members<br>• Update CCSF stakeholders on the severity and extent of the storm hazard<br>• Disseminate storm alerts and public messaging through the Public Information Officer (PIO)/Joint Information System (JIS)<br>• As necessary, activate the EOC to provide support to storm response activities in the field<br>• Request an emergency declaration from the Mayor, if needed<br>• Provide logistical and resource support to CCSF Departments and community partners involved in storm response and recovery<br>• Coordinate state, federal and private sector disaster assistance |

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| Department of Public Health (DPH) | • Assess any potential storm consequences on the operational continuity of DPH healthcare partners; communicate and coordinate with partners accordingly<br>• Issue any necessary health precautions to the public (as necessitated by the predicted or actual storm impact)<br>• Homeless Outreach Teams increase efforts to get people indoors during severe weather episodes<br>• Monitor storm impact on healthcare facilities including hospitals, neighborhood clinics, and behavioral/mental health clinics; support facilities with situation information and resources as requested<br>• Provide oversight for hospital transfers and/or evacuations (given extended power outages or other storm impacts to healthcare facilities)<br>• Assess the need to open medical shelters in the event of extended power outages<br>• Conduct environmental health inspections in flood areas to determine health risks to residents; disseminate appropriate guidance to the public<br>• In general, provide coordinated medical and public health assistance as necessitated by the storm |

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| Emergency Medical Services (EMS) | • Monitor hospitals for ambulance diversions and potential storm-related power outages; work with PG&E on power restoration<br>• Ensure the 9-1-1 system has adequate ambulance capacity; facilitate mutual aid for additional ambulance units as needed<br>• Work with ambulance providers and hospital emergency departments on any patient surge due to storm impact<br>• Serve as the Medical Health Operations Area Coordinator (MHOAC) for medical mutual aid needs due to a storm emergency |

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| General Services Agency (GSA) | • Deploy Real Estate Crews and Building Stationary Engineers to clean catch basins around the perimeter of GSA buildings<br>• Ensure adequate fuel is in place for facilities with generators maintained by GSA<br>• Coordinate any storm response activities and planning with other departments and programs that are part of GSA services, including the two convention facilities – Moscone Center and Bill Graham Civic Auditorium<br>• Receive storm-related calls from the public on downed trees, clogged catch basins, flooded streets and power outages (via the CCSF 3-1-1 system)<br>• Report storm damage information (received via 3-1-1) to relevant departments such as SFPW, SFPUC and SFMTA<br>• Support the CCSF EOC Logistics Section when activated<br>• In general, ensure uninterrupted, safe operations in GSA facilities for both CCSF staff and the general public |

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| Human Services Agency (HSA) | • Monitor capacity/vacancies within the existing emergency (homeless) shelter system; add surge capacity to the system given severe weather<br>• Activate pop-up, severe weather shelters as needed<br>• Monitor storm impact on more vulnerable populations served by HSA programs (IHSS consumers, foster care children, etc.)<br>• Determine the need to support residents in their home (based on storm impact to infrastructure)<br>• Activate Commodity Points of Distribution (C-PODs) if necessary to support people sheltering-in-place<br>• Support storm evacuees with shelter if limited evacuations in affected neighborhoods become necessary<br>• Establish a Local Assistance Center (LAC) when storm impact creates a need for individual recovery assistance (the LAC is a location for receiving recovery resources)<br>• Coordinate the involvement of other City Departments in response to storm-related care and shelter service needs |

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| Municipal Transportation Agency (MTA) | • Based on severity of the forecast, perform pre-storm inspection of subway drains to ensure adequate storm water run-off<br>• Monitor overall traffic flow throughout the CCSF during the storm duration<br>• Report areas of street flooding (as identified by MTA units in the field)<br>• Deploy Parking Control Officers to priority intersections where traffic signals are out due to power outages<br>• Monitor the potential for flooding at underground MUNI stations and close stations as necessary due to flooding or extended power outages<br>• Adjust public transit operations and service routes based on storm impacts; some lines may be temporarily taken out of service for safety reasons<br>• Monitor overall MUNI ridership volume for any required storm-related service adjustments<br>• Provide transport for evacuees if storm impact requires the limited evacuation of any CCSF neighborhoods |

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| Pacific Gas & Electric Company (PG&E) | • Determine the neighborhoods and number of customers impacted by storm-related power outages<br>• Activate PG&E Emergency Preparedness and Operations Teams, as needed, to restore power by replacing blown transformers, broken cross arms and repairing downed electric wires<br>• PG&E gives priority to critical facilities such as hospitals, water pumping stations, police and fire departments for repair work and power restoration |

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| Pacific Gas & Electric Company (PG&E)<br><br>[continued] | • Where flooding, erosions, or landslides have affected gas service, deploy gas operation crews to relight gas pilots and perform gas-appliance safety checks<br>• Monitor the status of electrical infrastructure at substations; overland flooding may block access to underground utilities and damage electrical boxes and substations<br>• Work in coordination with SFPW to remove trees that have toppled over on power lines from wind and rain impacts |

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| The Port of San Francisco (Port) | • Prepare Port personnel, tenants and properties for storm impact<br>• In coordination with the US Coast Guard, ensure maritime safety during storm activity and establish restrictions as needed<br>• Monitor storm inundation and assess storm damage to various Port infrastructure such as buildings, piers, support structures, open space and waterfront promenades including the Embarcadero Roadway<br>• Identify locations where coastal storm surge and waves may top the Port's seawall<br>• Monitor storm impact on Ferry Operations<br>• Monitor the Port drainage system (separate from the PUC system) and mitigate any problems with storm water run-off |

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| Public Utilities Commission (SFPUC) | • Perform pre-storm inspection and cleaning of catch basins, storm drains and sewers<br>• Organize crews for Vactor, Storm Watch, and Sewer Operations, as needed<br>• Assign crews to designated zones throughout the CCSF to ensure timely storm response to any area within the CCSF<br>• Deploy flood barriers at specific locations when certain thresholds are met<br>• Work with SFPW to clear clogged catch basins and help to clear downed trees when appropriate<br>• Utilize Vactor Trucks to clear out clogged storm drains when appropriate<br>• Perform emergency waste water and sewer system repairs<br>• Monitor system capacity for managing storm water run-off including operations at pump stations and wastewater treatment sites<br>• Given sewer overflows during heavy storm water runoff, post signage for Beach Closures and/or Stay Out of the Water<br>• Monitor and respond to storm related power outages on Treasure Island and at other CCSF government facilities<br>• Gather and share information on storm impacts<br>• Coordinate with SFPW and other city partners concerning the release of public information on storm impacts |

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| Public Utilities Commission (SFPUC)<br><br>[continued] | Based on monitored forecasts from the National Weather Service, SFPUC takes the following actions:<br>• When the forecast has a 30% or greater chance of rainfall, the SFPUC prepares the North Point Wet-Weather Facility (NPF) for activation. This provides the CCSF with a third waste water treatment facility.<br>• When the forecast predicts rainfall of one-half inch or less, SFPUC checks on catch basins in pre-identified areas to ensure clearance for the collection of rainwater and street runoff.<br>• When the forecast predicts rainfall between one-half inch to one inch, SFPUC activates their Storm Watch Operations. The plan calls for additional staff to be put on standby for additional response.<br>• When the forecast predicts rainfall to be greater than one inch, SFPUC may deploy additional crews. Additional crews are assigned to one of eight field response zones throughout San Francisco. This ensures rapid response to reports of sewer backup or flooding issues. |

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| Public Works (SFPW) | • Obtain and distribute sandbags for flood prevention to San Francisco residents and businesses<br>• Pre-storm inspection and cleaning of gutters, roadways and catch basins<br>• Pre-storm inspection of scaffolding (based on permits issued) to ensure scaffold does not block public path-of-travel and to ensure scaffold integrity given potential storm impact<br>• Assign crews to known hot-spots and storm affected areas; work in tandem with SFPUC crews<br>• Respond to reports of downed trees, tree limbs, storm debris and street flooding<br>• Respond to reports of hill slides<br>• Work with SFPUC to clear clogged catch basins and to mitigate street flooding<br>• Conduct damage assessments (bridges, tunnels, streets, government buildings as requested, etc.) in the aftermath of a severe storm event<br>• As necessary, and as requested by SFPD or other departments, close streets that are unsafe for travel given storm impacts (i.e., Great Highway)<br>• Coordinate storm-related debris removal<br>• Identify and engage contractors who can provide heavy and specialized equipment, when needed in response to storm damage<br>• Repair and restoration of CCSF facilities and systems, as requested |

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| Recreation and Parks Department (RPD) | • Monitor storm impact on all RPD properties such as downed trees on roads in Golden Gate Park and storm surge along the Yacht Harbor<br>• Close and/or secure any RPD sites or parklands based on storm related impacts<br>• When multiple sites sustain damage, clear high priority storm damage first<br>• Make specific and selective recreation centers available for emergency use (as availability permits) |
| SF Fire Department (SFFD) | • Respond to 9-1-1 storm calls for trees and wires down, flooding and water removal, building alarm malfunctions, elevator rescues, electrical hazards and other utility emergencies<br>• Establish liaison with Public Works and DBI to ensure mutual support<br>• Respond to landslides, roadway undermining, and provide rescue where needed<br>• Provide equipment and personnel capable of removing water from flooded areas<br>• Respond to hazardous materials incidents if triggered by storm impacts<br>• Activate surf rescue and marine units as needed for Bay response to storm incidents<br>• Help to coordinate evacuation operations if triggered by flooding or extended power outage incidents; support healthcare facility evacuation, if necessary<br>• Coordinate neighborhood response with local NERT teams given declaration of a local emergency<br>• Continue to maintain the continuity of core response functions -- fire suppression, rescue services, hazardous materials response and emergency medical services |
| SF Police Department (SFPD) | • Monitor storm impact on CCSF neighborhoods (notify dispatch of downed trees, street flooding, traffic signal outages and other storm incidents); respond to storm-related 9-1-1 calls<br>• Restrict public access to locations where there is a storm-related hazard (flooding, hill/mud slides, downed power lines, etc.)<br>• Work with SFPW to close roadways due to flooding or other hazards<br>• Assist with any evacuation operations caused by the storm<br>• Provide support with any storm-related traffic and crowd control matters<br>• Continue to maintain the continuity of core public safety response functions |

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| SF Sheriff's Department (SFSD) | • Monitor the continuity of operations at county jails (adjust operations as needed given storm-related power outages)<br>• Monitor storm impact on CCSF facilities where SFSD has an on-site presence<br>• Support SFPD with law enforcement operations related to storm response<br>• Maintain the continuity of core public safety response functions |
| SF Unified School District (SFUSD) | • Ensure that SFUSD generators are operational with adequate fuel<br>• Clear storm drains at sites that regularly flood during storms<br>• Activate protocols for rapid response to downed trees, and blocked or backed-up storm and sewer lines<br>• Make a determination on the need for school closures and provide notification as necessary<br>• Serve as short-term storm shelters for displaced persons when school is not in session |
| Treasure Island Development Authority (TIDA) | • Monitor status of utility infrastructure throughout Treasure Island (TI) and Yerba Buena Island (YBI) including aerial power lines, utility poles and the TI/YBI separated storm sewer system in conjunction with SFPUC<br>• Monitor potential for isolated street flooding, storm sewer backups and localized flooding at Island properties in conjunction with SFPUC and SFPW<br>• Monitor potential for soil erosion and hillside weakening on YBI where debris runoff could block roadways<br>• Monitor potential for downed trees on TI and YBI which could block roads or impact utility infrastructure<br>• Support HSA sheltering operations by providing on-Island open space for HSA-shelter operations |

# Section 4: Concept of Operations

The following segment outlines the storm response roles of the various Branches in the Operations Support Section of the CCSF Emergency Operations Center (EOC), including the public messaging component of the Joint Information System.

## 4.1 Public Safety Branch

The Public Safety Branch provides the coordination and support for agencies engaged in public safety storm response operations. The Branch will also coordinate mutual aid requests from law and fire emergency response agencies as necessary for extended storm response operations. During a storm event, the Branch will provide the following EOC coordination.

**Emergency Support Function #2 – Communication**

- Monitor the Computer-Assisted Dispatch (CAD) system for situational awareness on the volume, location and nature (type of incident) of public safety response activities.

**Emergency Support Function #4 – Firefighting**

- Assist with the coordination of any response to severe flooding, power outages and/or hillside collapse (SFFD will likely act as the first responder when these storm-related calls are received at the 9-1-1 Dispatch Center).

- In addition, SFFD will assist with the EOC coordination of storm response functions involving emergency medical services and hazardous materials response.

**Emergency Support Function #9 – Urban Search and Rescue**

- Coordinate operations when there are collapsed structures that require the extrication of victims, or coastal storm incidents that require the water rescue of victims.

**Emergency Support Function #13 – Law Enforcement**

- As specific storm-related threats are identified, coordinate law enforcement, public safety and security operations within the EOC.

In response to a winter storm event, the Public Safety Branch is responsible for providing the EOC with situational status information on the following elements.

- Damage/Incident Reports

- Emergency Medical Service Volume

- Evacuation of any targeted buildings or neighborhoods

- Field Unit Activities
- Fire Response
- Incident Command Posts
- Injuries and Fatalities
- Mutual Aid
- Restricted Areas
- Search and Rescue

## 4.2 Health & Human Services Branch

The Health and Human Services Branch provides the coordination and support for agencies engaged in carrying out health and/or care & shelter support to persons impacted by the storm event. During a storm event, the Branch will provide the following EOC coordination.

**Emergency Support Function #6 – Mass Care, Housing and Human Services**

- Coordinate the activities and resources necessary to meet the housing (shelter), feeding, and human service needs of storm affected persons.
- Coordinate the provision of pop-up shelters to get persons living on the street into a warm, dry space during storm activity.
- Administer disaster assistance programs as needed to help persons affected by the storm recover their non-housing losses.
- Coordinate voluntary agency assistance that becomes available to support ESF #6 mass care services.
- Support the storm-related needs of persons with disabilities:
    - Given extended power outages, establish power stations at shelters where people with disabilities can charge mobility devices (primarily power wheelchairs) and other communication and assistive technology devices. This also includes having refrigeration available for medications that require refrigeration.
    - For storms that cause protracted service impacts, HSA will provide wellness checks for recipients served through their In-Home Supportive Services (IHSS) program. As care providers may also be impacted by the storm, the checks will ensure that higher risk persons are continuing to receive personal assistance

care. Wellness checks will also ensure IHSS recipients have enough food, water and medications on-hand.

- Where limited neighborhood evacuations are in effect, work with the Traffic and Transportation Branch to ensure there is accessible transportation for people with disabilities who need it. Similarly, work with responders (SFPD and/or SFFD) to ensure evacuations of people with disabilities include their mobility device and their medications, if possible.

- Client databases maintained by IHSS, SF Paratransit, and home-delivered meal providers (such as Meals on Wheels or Project Open Hand), are the best sources for identifying persons with disabilities for the purpose of a direct dissemination (mass emailing or hand delivery) of storm-related or recovery information to persons with disabilities.

**Emergency Support Function #8 – Public Health and Medical Services**

- Coordinate services that provide health and medical support during a storm incident, including the coordination of mental and behavioral health care.

- Where neighborhood flooding occurs, assess the environmental health impact to the public (such as the health impact due to possible sewage overflows).

**Emergency Support Function #11 – Animal Response**

- Coordinate veterinary, reunification, and other animal care and shelter services.

- Given a storm incident that causes localized evacuations, coordinate support to those evacuees that need assistance evacuating or sheltering their pet.

In response to a winter storm event, the Health and Human Services Branch is responsible for providing the EOC with situational status information on the following elements.

- Affected Populations
- Animal Response
- Assessment Teams
- Commodity Distribution (Food & Water)
- Evacuations
    - General population evacuation
    - Healthcare facility evacuation

- Family Assistance Center
- Family Reunification
- Hospital Diversions
- Individual and Family Assistance
- Interim Housing
- Local Assistance Centers
- Sheltering
- Support to Residents in their Homes
- NGO Support
- Vulnerable Populations/Access and Functional Needs

## 4.3 Infrastructure Branch

The Infrastructure Branch provides the coordination and support for agencies engaged in carrying out public works, engineering, water, and other utilities functions. During a storm event, the Branch will provide the following EOC coordination.

**Emergency Support Function #3 – Public Works and Engineering**

- Coordinate the activities and resources necessary to mitigate the impact of a storm event on CCSF infrastructure (i.e., keeping catch basins clear to prevent street flooding, or clearing debris and fallen trees from roadways).
- Provide engineering and construction management expertise as necessary when responding to storm impacts including damage to buildings, roadways, bridges, utilities and other CCSF infrastructure.

**Emergency Support Function #12 – Water and Utilities**

- Facilitate coordination among utility partners – gas, electric, water and sewer – as needed to address system damage, shortages or outages.
- Support system restoration efforts given damage or disruptions to the utility infrastructure during a storm event.

In response to a winter storm event, the Infrastructure Branch is responsible for providing the EOC with situational status information on the following elements.

- Damage/Impact Reports
- Debris Management (Fallen Trees)
- Field Unit Activity
- Flooding
- Infrastructure
    - Essential Utility Services Restoration
    - Infrastructure Repairs
- Power Outages
- PUC Pump Stations
- Street Cleaning

## 4.4 Traffic & Transportation Branch

The Transportation Branch maintains oversight for the activities of transportation providers and provides status updates on the condition of transportation networks during a storm event. Transportation networks with the CCSF include air, rail, roadway and marine traffic. During a storm event, the Branch will provide the following EOC coordination.

**Emergency Support Function #1 – Transportation**

- Consolidate assessment data on damage or disruptions to transportation networks, such as roads and bridges; coordinate with partners to adjust service delivery (i.e., shutdowns and re-routes, or adding additional transportation capacity to meet emergency demand).
- Serve as the EOC liaison to commercial transportation providers (i.e., Caltrain, taxis and ferry operators) and regional entities like Water Emergency Transportation Authority (WETA) and the Metropolitan Transportation Commission (MTC).

In response to a winter storm event, the Traffic and Transportation Branch is responsible for providing the EOC with situational status information on the following elements.

- Airport Operations
- BART
- Caltrain

- Evacuation Routes (if applicable)
- Ferries
- Paratransit
- Port of San Francisco
- Route Recovery/Route Clearance
- Maritime Restrictions
- MUNI Service
- Road Closures
- Traffic Flow/Changes

## 4.5 Community Support Branch

The Community Branch serves as a clearinghouse for a diverse cross section of external CCSF community partners. It includes representation from the commercial business sector, non-governmental organizations (NGOs) including neighborhood groups, the Interfaith Council, nonprofit organizations and schools. During a storm event, the Branch will provide the following EOC coordination.

**Emergency Support Function #16 – Community Support**

- Provide the EOC with a more complete operational picture of community needs given those diverse entities identified above.
- Support the EOC with a more in-depth accounting of storm impact and related service gaps affecting individuals and neighborhoods.

In response to a winter storm event, the Community Support Branch is responsible for providing the EOC with situational status information on the following elements.

- Affected Communities/Neighborhoods
- Business Impact
- Dormitory Space Available
- Hotel Rooms Available
- Interfaith Council

- NGO Support
- Recovery Assistance
- School Closures and Relocations
- Tourists and Visitors

## 4.6 Public Information

Providing the public with information before, during and after critical storm incidents can help to mitigate the storm's impact on persons and property. Information may guide people in preparing for the event and keeps them informed during the event. Whenever the EOC is activated for an emergency, the Joint Information Section is responsible for managing and coordinating the functions of public information. When the Joint Information Section is not activated, the Department of Emergency Management External Affairs coordinates public information functions across CCSF Departments.

**Emergency Support Function #15 – Joint Information System**

- The Joint Information Section supports EOC and field operations by providing accurate, coordinated, timely, and accessible storm-related information to affected audiences (i.e., other City departments, external partners, the media, private sector, and the local CCSF population).
- Dissemination of storm specific information may include the following content.
- Pre-Event Storm Information
    - National Weather Service advisories, watches and warnings
    - Closings, delays and openings for government buildings, schools, public transit systems, etc.
    - Encouraging the public to get supplies — Fill up gas tanks, and stock up with food, water, medications, flashlights, and any pet supplies
    - Telling the public to stay informed — Monitor text and email alerts from AlertSF and stay tuned to local TV and radio stations for updates
    - Have a backup plan — If power goes out, or a home becomes damaged, know where you can stay
    - Power up— Keep communication, mobility, and assistive devices charged (e.g., cell phones, computers, power wheelchairs, medical devices, etc.)

- Shelter information — Locations for rainy night, pop-up shelters (for homeless people)

- Storm Information During the Event
  - Protective actions — "Stay off the roads" and "Stay inside" notices during the storm
  - Road conditions, road closures, visibility, weather-related incidents such as flooding, debris slides or power outages, and traffic updates
  - Updates to National Weather Service advisories, watches and warnings
  - Emergency declarations, closings, delays and openings for government buildings, transit systems, schools, etc.

- Post-Event Storm Information
  - Progress updates on clearing roads of storm debris or flooding and requests for public to help clear storm drains
  - Updates: shelter closings, school openings, public building openings, transit lines rerouted, public transit restart
  - Emergency declaration updates and closings, delays and openings for government buildings, transit systems, schools and more

Information is not actionable if it is not accessible. Communication of storm-related information to people with disabilities requires the following additional considerations and awareness.

- Simplicity – Messaging should be kept simple – not higher than a third grade reading level.
- Captioning – Ensure that broadcasters and internet video providers (including local government) provide captioning for press conferences and television interviews.
- Audio – Include voiced reports to reach people who cannot read flashing news TV updates or text messages.
- Interpreters – They are required during press conferences to ensure accurate and effective communication. This includes both sign language interpreters for deaf and hard of hearing audiences and bilingual language interpreters for limited or non-English speaking populations – especially if trying to reach a specific neighborhood with a large immigrant population.
- Translation – Any written storm information being distributed to the public (such as storm tips or recovery assistance information) needs translation into multiple languages.

# 4.7 Flood Risk

The National Weather Service distinguishes between Floods and Flash Floods.

- **Flood:** An overflow of water onto normally dry land; the inundation of a normally dry area caused by rising water in an existing waterway, such as a river, stream, or drainage ditch; or ponding of water at or near the point where the rain fell. Flooding is a longer term event than flash flooding (below) as it may last days or weeks.

  Note: Although San Francisco no longer contains active streams, stormwater still travels on the ground surface along historic waterways (e.g. former creekbeds) dictated by gravity and the city's hilly terrain. Flooding in the City generally occurs during large rain events that surpass the collection system's design capacity, causing stormwater to accumulate on the surface particularly in low-lying areas.

- **Flash Flood**: A flood caused by heavy or excessive rainfall in a short period of time, generally less than 6 hours. Flash floods are usually characterized by raging torrents after heavy rains that rip through river beds, urban streets, or mountain canyons sweeping everything before them. They can occur within minutes or a few hours of excessive rainfall. They can also occur without rain; for instance after a levee or dam has failed.

When flooding does occur in San Francisco it will occur as either coastal flooding from storm surge, or localized flooding in lower-lying inland areas during periods of heavy rain.

## 4.7.1 Coastal Flooding

Coastal flooding in San Francisco is generally caused by high tides (including king tides), storm surge, and wave action associated with Pacific Ocean storms. These storms typically occur from November through February, and affect the open Pacific Ocean coast and the shoreline of San Francisco Bay. Most of the Pacific Ocean coastline consists of bluffs, beaches, and sand dunes. However, the Great Highway is frequently closed during storm events and was severely damaged during a winter storm in 2010. Along the bay shoreline, inundation may close roadways such as portions of the Embarcadero Roadway and cause damage to nearby structures; wave action can also damage waterfront facilities. Parts of Treasure Island and SF Port properties are generally at greatest risk from bayside coastal flooding.

## 4.7.2 Localized Flooding

Localized flooding or stormwater ponding results when either the intensity or duration of a storm event overwhelms the capacity of the collection system. The overland flow of rainfall exceeds the system's ability to capture, store, convey, treat, and release it. The result is that stormwater has no place to exit and may begin to "pond" in low-lying areas. Most often this ponding takes place at street intersections, but ponding may also flow into nearby structures if drainage and grading are cannot keep water away. For an overview of the stormwater system see Section 4.7.3 San Francisco's Stormwater Management System.

Localized flooding may also carry potential pollution risks. San Francisco operates a combined sewer system, whereby both stormwater and sewage are managed through the same infrastructure of underground pipes. During heavy rain events, the combined water in the system consists of mostly stormwater and if the system reaches capacity, a surcharge of the system can occur in lowlands. Combined water may flow upwards and out of manholes or catchbasins and further exacerbate a localized flooding incident. While extreme flooding is rare, there have been incidents where up to 4 feet of water has collected in isolated locations (see Section 4.8 Flood Response Actions).

Areas in San Francisco where there is a history of localized flooding have been identified by the SFPUC (see Appendix 2: Flood Risk Locations in San Francisco).

Severe incidents of localized flooding may generate the following hazards:

- Street closures and transportation impacts including closure of underground transit stations impacted by flood waters
- Hazardous debris flows (hazardous materials carried by flood waters)
- Electrical hazards (when flood waters come in contact with downed wires)
- Natural gas leaks (As floodwaters rise, there is potential to penetrate the natural gas system in low-lying areas and/or to potentially cause breaks in gas mains.)
- Bacteriological contamination of persons, animals and property
- Residential sewage back-ups (Sewage flows out of lower drains and toilets.)
- Open manhole covers (when dislodged by extreme water pressure)
- Property Damage (Inundation of buildings can adversely impact structural integrity, as well as cause damage to interior property and fixtures.)
- Vehicle floatation (Six inches of water will reach the bottom of most passenger cars and a foot of water will float many vehicles.)
- Drowning

## 4.7.3 San Francisco's Stormwater Collection and Treatment System

The CCSF is unique in California as the only city served predominantly by a combined sewer system. As mentioned in the previous section, San Francisco collects both sewage and stormwater in the same network of pipes. These pipes then carry the combined flow for treatment at one of three SFPUC treatment facilities:

- Southeast Water Pollution Control Plant,

- Oceanside Water Pollution Control Plant, or
- North Point Treatment Facility (operates only during wet weather).

Once treated, the flow is eventually discharged into either the San Francisco Bay or Pacific Ocean. To enhance system capacity (especially during rainfalls), large volumes of combined water that cannot be immediately processed are held in underground storage vaults called transport/storage (T/S) structures. The combined water is held in these T/S facilities until it can be directed to one of the three treatment plants. The T/S facilities literally encircle the city and during sustained rainfall they can hold nearly 200 million gallons of stormwater runoff.

On a typical dry weather day, this system collects and treats 70 million gallons of wastewater, primarily municipal sewage. However, during rainy weather, with the T/S structures and with 3 treatment plants at full capacity, the system can collect, transport, store and treat 575 million gallons per day of combined water. Storms that bring too much water, too quickly, or bring a sustained high volume of rainfall for an extended time can eventually exceed system capacity. Whereas a separated storm drainage system would directly discharge untreated flows to receiving waters when overwhelmed, the City's T/S structures provide the added benefit of primary treatment by allowing floatables and other solids to settle out before combined water is released from the system.

### 4.7.4 FEMA Flood Zones & National Flood Insurance Program (NFIP)

The CCSF became a member of the NFIP in 2010. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Flood Insurance Rate Maps (FIRMs), which define a community's base flood elevations, flood zones, and floodplain boundaries, were developed by FEMA for the CCSF in 2007. The FIRM map is used for both floodplain management and insurance purposes.

The CCSF has been working with FEMA to amend the original 2007 proposed FIRMs in several respects. These include ensuring that work done at SFO to address flooding is reflected in the FIRM; and that the FIRMs recognize the Port's finger piers and sea wall as actual structures, so they are classified in a way that allows them to be developed. The piers and sea wall are currently shown as VE[1], or within a Special Flood Hazard Area, which would preclude development. It is possible that an updated FIRM map will be finalized for the CCSF toward the end of 2016. See CCSF Hazard Mitigation Response Plan, June 2014, for more details and maps.

## 4.8 Flood Response Actions

Localized flooding incidents with ponding of a few inches occur during heavier rain events. Incidents of major flooding, with ponding depths from 2 to 4 feet are irregular, isolated events.

[1] VE refers to a coastal flood hazard area on the FIRM with a 1% or greater chance of flooding and an additional hazard associated with storm waves.

However, their occurrence requires the coordinated response of multiple CCSF Departments. The incident described below illustrates the actual impact given a severe localized flooding incident.

On the morning of February 25, 2004, San Francisco experienced an intense storm cell that traveled from the southwestern sector of the City in a northeast direction towards the Bay Bridge. The storm severely impacted areas around the San Francisco State University campus, as well as residents and businesses in the St. Francis Wood/Ingleside District, Excelsior District, Mission District, and South of Market area. The most intense period of the storm lasted less than one hour, after which the water drained into the sewers within a relatively short timeframe.

The severity of flooding ranged from localized ponding on the streets to entire streets and homes flooded with 2 to 4 feet of water. In several areas, cars floated down streets creating safety hazards. In one area of the City, a pedestrian was picked up and carried by the floodwaters. The water in several areas was electrified, causing the death of at least one homeowner's pet. Many areas of the City did not have traffic control during the flooding period, and automobiles moving down flooded streets caused wakes which increased flood damage in peoples' homes and businesses.

### 4.8.1 Field Level Flood Response Activities

The field level response to a major flooding incident, as described above, is outlined below.

- Reports of serious flooding are likely to be received as 9-1-1 calls to the City's Emergency Communications Center.
    - The City's 3-1-1 phone line will also coordinate non-emergency flood call-taking and dispatch activities for both SFPW and SFPUC.
- As first on the scene, either SFFD or SFPD will likely assume incident command and establish a command post.
- Their first priority will be to assess the situation for existing life hazards and respond with any necessary rescue or life safety operations.
- Depending on the scope of the incident, a unified command with other responding departments may be established.
    - Additional departments to SFFD and SFPD may include ARC, DBI, DPH/Environmental Health, PG&E, SFMTA, SFPW and SFPUC.

The Command Post may then coordinate the following flood response operations.

- Establish a perimeter around the impacted area to divert additional traffic from entering (SFPD and SFMTA).
- Direct utilities to be shut off in flooded areas (PG&E, SFPUC).

- Create a staging area where additional response vehicles, equipment, and resources may be safely deployed (SFFD, SFPW & SFPUC).

- Engage in mitigation efforts to reduce the current flooding and lessen its impact.

    - Unclog drains and sewers if necessary, and/or perform any necessary emergency waste water and sewer system repairs (SFPW and SFPUC).

    - Place sandbags at critical points to divert water flow (SFFD and SFPW).

    - Pump out flood waters (SFFD, SFPW, SFPUC).

    - Test the safety of drinking water (SFPUC).

    - Remove vehicles at risk of being swept away by flood waters (SFPD, SFMTA/DPT).

    - Check for displaced manhole covers (SFPUC & SFPW).

- Communication with flood impacted residents (SFFD, SFPD & SFPUC).

    - As floodwaters may contain pollutants and other contaminants (given flooding from sewer backups), inform residents about steps to take to protect themselves and their property. See the advisories below.

    - Issue safety advisories about the possibility of unsafe drinking water and/or the dangers of entering into, or coming in contact, with flood waters.

    - Instruct residents to use rubber gloves when handling flood-affected items.

    - Advise property owners to photograph and document any property damage or losses from the incident.

    - Provide impacted residents with ongoing flood status updates.

- If the flood zone is growing, provide a warning to residents in adjacent areas who may be subject to impending flood impacts (SFFD, SFPD, and SFPUC).

- Perform an initial inspection of impacted properties to determine if there are habitability concerns (DBI).

    - DPH may also dispatch Environmental Health Inspectors to assess the impact of flooding on the public health of residents and determine any specific public health needs.

- Determining whether to evacuate or shelter-in-place:

  - Waters from street flooding typically recede quickly; an immediate evacuation of low risk buildings may not be prudent. The hazards – electrical, bacteriological, hazardous debris, etc. – of evacuation through flood waters are substantial.

  - The safest short-term option is to suggest residents temporarily shelter-in-place and relocate, if possible, to an area of their home or office, away from the water.

  - If it is determined that there is a life hazard that warrants evacuation, and/or if the building is at risk or is uninhabitable, then SFFD and SFPD will jointly develop an evacuation plan that determines the safest means (given the situation) for moving residents from their home to an area of safety.

  - Provide emergency shelter for people displaced from their homes as a result of the flood (ARC and HSA).

- Assess the immediate needs of impacted residents and connect the resources of other City Departments or community partners to meet needs.

- Determine whether a representative from the City Attorney's Office should be at the site to assess the situation and gather information related to future claims that property owners may file.

<u>Cleanup and Restoration</u>

- Once flood waters recede, perform street sweeping and cleaning (SFPW).

- Reopen the area for vehicular access once the area has been cleared as safe (SFMTA and SFPD).

- Complete a final assessment of needs within the affected area and ensure that residents are connected with recovery services as needed (HSA, SFDPH and SFPUC).

  - This may require continued monitoring within the area to identify any unmet needs or additional problems that develop in the following days (SFPUC).

- Property owner responsibilities (in addition to consideration for obtaining flood insurance):

  - Debris Removal – The pick-up and disposal of debris on private property is the responsibility of the property owner. Owners should document (photograph) any losses due to water damage prior to the disposal of damaged personal items.

  - Sidewalk Cleaning – Property owners maintain responsibility for cleaning their own sidewalks.

  - Landscaped Area Cleaning – Owners are also responsible for cleaning any landscaped areas on the sidewalk, or on their personal property.

- Note: SFPW may exercise discretion in making additional assistance available to property owners with street and sidewalk cleaning.

### 4.8.2 Emergency Operations Center (EOC) Level Flood Response Activities

The EOC will maintain and share a common operating picture of the situation with stakeholders and will support responding elements with resources. Additional EOC activities may include the following.

- Consider the proclamation of a local emergency to facilitate access to outside resources and to help with cost reimbursement and resident recovery including property loss.
- Obtain targeted forecast information, such as updates on duration and projected intensity of storm activity for the impacted area, from the National Weather Service.
- Ensure the continuity of City services to residents both in and outside the flood area.
- Keep the public informed through press releases and periodic media briefings, including any protective actions that may become necessary.
- Receive and fill resource requests from activated Department Operation Centers (DOCs).
- Establish resource allocation priorities and share with the DOCs if necessary.
- Coordinate mutual aid requests with state and federal partners if necessary.
- Communicate and coordinate with senior and elected officials; receive direction from the Policy Group.

## 4.9 Winter Weather & At-Risk Populations

The CCSF Human Services Agency (HSA), in conjunction with their community and faith-based service partners, routinely arranges for the sheltering and care of individuals on our streets who are unable to provide themselves with adequate shelter. On those occasions when nighttime temperatures are forecast to go below 35°F, or when other hazardous winter storm events are forecast, HSA will take preventative steps to augment the existing emergency (homeless) shelter system. Through their partner organizations, HSA can increase the number of available shelter beds on very short notice. This ensures that those individuals who are outdoors and are most impacted by inclement weather events will have an opportunity to find a bed indoors.

During severe weather incidents HSA will implement its Cold Snap Protocol, which acts to maximize the resources of every shelter in San Francisco. Additional beds are made available on an emergency basis, and the normal reservation system for obtaining a shelter bed is suspended. In essence, it tells all shelters on contract to HSA to let people into any vacant bed

after 8 p.m. regardless of whether they have a reservation or not. It makes securing a bed much easier for people who need an indoor place to sleep.

**Pop-Up Shelters**: Aside from making sure that HSA is able to maximize bed space at the eight existing city contracted shelter facilities, HSA may also activate temporary emergency shelter sites referred to as pop-up shelters. These sites are opened when an overflow of persons seeking shelter from the street during inclement weather is expected. The added sites help to ensure that everyone on the street who needs shelter has a bed somewhere within the emergency shelter system. HSA maintains a list of a dozen facilities that have the potential for being activated as pop-up shelters. The sites are managed either through HSA staff or through existing contracts HSA maintains with qualified homeless service providers.

In addition, personnel with the DPH Homeless Outreach Team (HOT Team) are called on to perform wellness checks for those who remain on the streets overnight during inclement weather. They check persons still on the street and urge those to seek shelter indoors. The HOT Team will give people rides to shelters to expedite their move.

# Section 5: Plan Maintenance

This Section describes the process for maintaining the plan. The description identifies who will receive and review the Plan, how the Plan will be updated, how the Plan will be tested, what type of training and exercises will be developed to enhance understanding and execution of the Plan, and how after-action review will be conducted after the Plan has been implemented.

## 5.1 Plan Updates

DEM is responsible for the maintenance, revision, and distribution of this plan. In coordination with key stakeholders and agencies with critical roles and responsibilities for the management and response to severe winter weather, DEM will annually assess the need for revisions to the plan based on the following considerations:

- Changes to city, state, or federal regulations, requirements, or organization
- Lessons learned through exercises or real events
- Implementation of new tools or procedures that alter or improve plan components

DEM will maintain a record of amendments and revisions as well as executable versions of all documents, and will be responsible for distributing the plan to all applicable agencies.

## 5.2 Plan Testing, Training and Exercising

Exercising the plan and evaluating its effectiveness involves using training and exercises and evaluation of actual disasters to determine whether goals, objectives, decisions, actions, and timings outlined in the plan led to a successful response.

Exercises are the most available method of evaluating the effectiveness of a plan. Exercises allow emergency responders and government officials to become familiar with the procedures, facilities, and systems that they will actually use or manage in emergency situations. Exercises will be conducted on a regular basis to maintain readiness. Exercises should include city departments and representatives from Cal Office of Emergency Services (OES) if practical.

## 5.3 After-Action Review and Corrective Action

After every exercise or disaster, an After Action Report (AAR)/Improvement Plan (IP) should be completed. The AAR/IP has two components: the AAR, which captures observations and recommendations based on incident objectives as associated with the capabilities and tasks; and the IP which identifies specific corrective actions, assigns them to responsible parties, and establishes targets for their completion.

# Appendix 1: List of Acronyms

The following acronyms are used in this annex:

| | |
|---|---|
| ARC | American Red Cross |
| ACC | Animal Care & Control |
| CCSF | City and County of San Francisco |
| C-POD | Commodity Point of Distribution |
| DEC | Division of Emergency Communications |
| DEM | Department of Emergency Management |
| DES | Division of Emergency Services |
| DHR | Department of Human Resources |
| DOC | Department Operations Center |
| DPH | Department of Public Health |
| EMS | Emergency Medical Services Agency |
| EOC | Emergency Operations Center |
| ESF | Emergency Support Function |
| HSA | Human Services Agency |
| ICS | Incident Command System |
| IMT | Incident management Team |
| JIC | Joint Information Center |
| MCI | Mass Casualty Incident |
| ME | Medical Examiner |
| MHOAC | Medical Health Operational Area Coordinator |
| MTA | Municipal Transportation Agency |
| NGO | Non-Governmental Organization |
| NWS | National Weather Service |
| OME | Office of the Medical Examiner |
| PIO | Public Information Officer |
| POD | Point of Dispensing |
| SEMS | Standard Emergency Management System |
| SFFD | San Francisco Fire Department |
| SFPD | San Francisco Police Department |
| SFSD | San Francisco Sheriff's Department |
| SFUSD | San Francisco Unified School District |
| TI | Treasure Island |
| YBI | Yerba Buena Island |

# Appendix 2: Flood Risk Locations

Locations at risk for flooding in San Francisco can be identified based on historical data – areas where repeated incidents of flooding have been documented. In most instances, flooding in these areas results from topographical factors that influence drainage flows described below. To help understand the drainage system within the CCSF, the SFPUC divides the city into two drainage basins: the Westside Basin (62% of the total city area) that drains into the Pacific Ocean, and the Bayside Basin (38% of the total city area) that drains into the San Francisco Bay.

Within these two basins are eight major urban watersheds that align with the historic creeks that once formed San Francisco's native landscape (each described below). The combined sewer system for San Francisco is organized according to these eight urban watersheds and therefore follows the natural topography of San Francisco (see Appendix 3 for a map of these drainage basins). Areas known for flooding are identified below for each of the eight urban watersheds.

**Bayside (Eastern) Basin -- Major Urban Watersheds & Flood Risk Areas**

1. **Channel Urban Watershed** -- The Channel Urban Watershed encompasses the downtown or urban core of San Francisco including the Financial District, Tenderloin and South of Market neighborhoods. It also includes the Mission, Mission Bay, Castro, and Western Addition neighborhoods, as well as portions of Pacific Heights, Nob Hill, and Potrero Hill. The Channel Urban Watershed once included waterways (Hayes Creek, Mission Creek, and Dolores Creek) that fed into Mission Bay, as well as the Precita Creek, which once flowed into the present-day Mission and Noe Valley Districts.

   Mission is a sub-watershed within the larger Channel Urban Watershed and the area most prone to flooding. It is largely a low-lying, subsidence area that receives flows from higher elevation drainage areas such as Noe Valley, the Mission Street commercial corridor, and the higher elevation areas south of Cesar Chavez Street. These three flows merge as one within Mission sub-watershed. Given that the combined sewers in the Mission sub-watershed were constructed over 100 years ago, flow capacity becomes challenged during heavy rain incidents. Known locations for flooding include the following.

   - Folsom Street between 14th and 18th Streets; with the most significant flooding at Folsom and 17th/18th Streets (San Francisco's lowest point and the site where Mission Creek used to flow)
   - Shotwell Street between 14th & 15th Streets and 17th & 18th Streets
   - Cesar Chavez and Mission Streets (The surrounding area is in a topographic low point within the basin.)
   - Cesar Chavez Street between Folsom and Harrison Streets

- Cesar Chavez Street between Valencia and Guerrero Streets
- Caesar Chavez and Highway 101
- Mariposa and Third Streets
- The South of Market area between Clara & Townsend Streets and 5th & 6th Streets (subsidence occurring in the South of Market area)

2. **Islais Creek Urban Watershed** -- The Islais Creek Urban Watershed covers the southeastern side of the City and includes Potrero Hill, Noe Valley, Bayview, Excelsior, Glen Park, Diamond Heights, and Bernal Heights neighborhoods. The basin is bounded by Twin Peaks to the west, Potrero Hill to the north, and San Francisco Bay to the east.

   The Cayugais a sub-watershed within the Islais Creek Urban Watershed and is known for serious flooding issues, especially along the lower (northern) end of Cayuga Avenue near the 280 Freeway. The topography of the area resembles a valley, as it is aligned with the historic Islais Creek. This means that overland flows coming into the Cayuga sub-watershed from Glen Park and the Outer Mission tend to follow the original creek route, which generally follows Cayuga Ave. However, the 280 Freeway is nearby and functions as a dam to stop the overland flow at the Cayuga Avenue cul-de-sac. Current limitations on the ability to move stormwater downstream from the Cayuga sub-watershed means the flow and water build-up cannot be processed fast enough in heavy rains, which results in flooding. Specific locations for flood risk include the following.

   - Lower end of Cayuga Ave (Mission Terrace) from Cotter Street (the 500-block of Cayuga Avenue) to the beginning of Cayuga Ave near Interstate 280 (especially the area near Cayuga and Rousseau Street)
   - Theresa Street between San Jose and Cayuga Avenues (These properties are below the Cayuga Ave street elevation.)
   - Alemany Boulevard and San Bruno Avenue (near the Alemany Farmer's Market)
   - San Jose Avenue and Monterey Boulevard (near the 280 Freeway)
   - Circular Avenue and Congo Street (also near the 280 Freeway on the west-side)
   - Toland Street between Evans and Jerrold Avenues

3. **Yosemite Urban Watershed** -- The Yosemite Urban Watershed includes the Hunters Point and Bayview neighborhoods as well as portions of the Portola, Bayview Heights, Excelsior, and Silver Terrace neighborhoods. It is located on the southeast side of San Francisco, bounded by McLaren Park to the west and San Francisco Bay to the east.

   - Bayshore Boulevard and Industrial Street

- The vicinity of Third Street and Bancroft Avenue
- The vicinity of San Bruno Avenue between Felton and Woolsey Streets

4. **Sunnydale Urban Watershed** -- The Sunnydale Urban Watershed spans approximately 2 square miles on the southeastern side of the City. The basin includes the Visitacion Valley neighborhood and portions of the Bayview Heights, Excelsior, and Crocker Amazon neighborhoods. This urban watershed is bounded by McLaren Park to the west and Candlestick Park and San Francisco Bay to the east.

   Most of the combined sewers in this urban watershed were constructed within the past 80 to 100 years. A number of the sewers in the area consist of 8 - 12-inch diameter pipes that flow into a 6 foot diameter sewer along Sunnydale Avenue. This area has experienced recurrent flooding incidents during heavy rain periods particularly at the following locations.

   - The vicinity of Sunnydale Avenue near Talbert and Peabody Street
   - Sunnydale Avenue near Bayshore Boulevard
   - The industrial vicinity of Allan Street, Schwerin Street and Bayshore Boulevard

**Westside (Oceanside) Watershed -- Major Urban Watersheds & Flood Risk Areas**

5. **Lake Merced Urban Watersheds** -- The Lake Merced Urban Watersheds is located in the southwestern corner of the City. It encompasses the neighborhoods of Park Merced, Ingleside, Ingleside Terrace, Ingleside Heights, and Westwood Park, among others. The urban watershed is bounded by Twin Peaks to the east, the Pacific Ocean to the west, and San Mateo County to the south. Areas of flood risk include the following.

   - 19th Avenue between Winston and Holloway (near SF State)
   - Entrada Court off of Ocean Avenue in Ingleside Terraces
   - John Muir Drive from Lake Merced to Skyline Boulevards

6. **Sunset Urban Watersheds** -- The Sunset Urban Watersheds is one of the largest in the City, second only to Islais Creek Urban Watersheds in size. The urban watershed encompasses the hilly neighborhoods of St. Francis Wood, Forest Hills, and Midtown Terrace, as well as the Outer Richmond, Sunset, and Parkside neighborhoods. The Sunset Urban Watersheds also includes a large portion of Golden Gate Park. Flood risk is generally limited to the outer Avenues in the Sunset District near the ocean, including the following areas.

   - The Great Highway between Lincoln Way and Sloat Boulevard (Ocean winds and high waves can add to Great Highway flooding.)

- Lincoln Way from 30th Avenue all the way out to the Great Highway
- The outer Avenues between Quintara Street and Sloat Boulevard
- Wawona Street and 15th Avenue

7. **Richmond Urban Watersheds** -- The Richmond Urban Watersheds includes the Inner and Central Richmond, Seacliff, Lone Mountain, and Laurel Heights neighborhoods, as well as major open space areas including Land's End and parts of the Presidio and Golden Gate Park.

   Flood risks in the Richmond Urban Watersheds are a function of isolated drainage issues and system capacity issues. Known locations of flood risk within the Richmond Urban Watersheds include the following.

   - Lake Street between 14th and 17th Avenues, especially 17th Avenue and Lake Street. The street surface at the end of 17th Avenue, next to the Presidio Trust, is built up higher than the crest elevation; flow will go down towards the low-lying garage area.
   - Old Mason Street between Halleck Street and Crissy Field within the Presidio

8. **Northshore Urban Watersheds** -- The Northshore Urban Watersheds stretches across the northern shore of San Francisco, from the Golden Gate Bridge in the west to the intersection of Market Street and the Embarcadero in the east. It includes Fisherman's Wharf, Chinatown, North Beach, and parts of the Financial District, the Marina District and Pacific Heights. It also contains a large portion of the Presidio.

   - The Embarcadero from North Point to Green Streets (High waves add to flooding issues along the Embarcadero waterfront.)
   - The Financial District area between California & Sacramento and Drumm & Davis Streets (Embarcadero Four)

Note: Much of the information above was taken from the City and County of San Francisco 2030 Sewer System Master Plan, December 2010.

# Appendix 3: SF's 8 Major Urban Watersheds

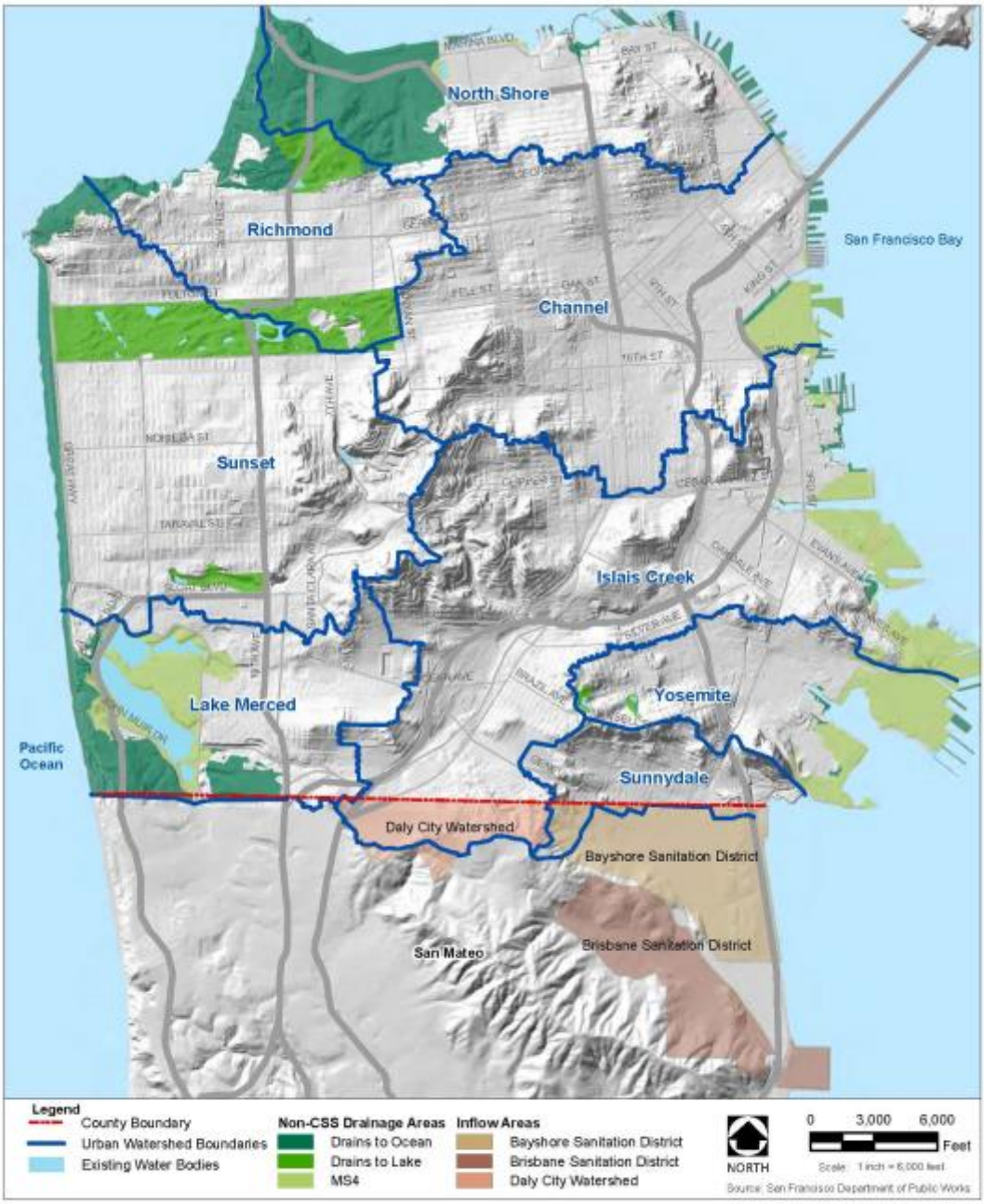


Figure 2.1: Service Area Map

San Francisco Water Power Sewer

San Francisco Public Utilities Commission Sewer System Improvement Program
Bayside Drainage Basin Urban Watershed Characterization
FINAL DRAFT Technical Memorandum (July 2013)