San Francisco Department of Public Health Extreme Heat Response Plan

An Annex to the SFDPH Emergency Operations Plan

SFDPH
Environmental HEALTH
improving environments protecting health

PROGRAM ON HEALTH, EQUITY AND SUSTAINABILITY

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Acknowledgments
This report was made possible through funding from cooperative agreement from the Centers for Disease Control and Prevention (CDC).

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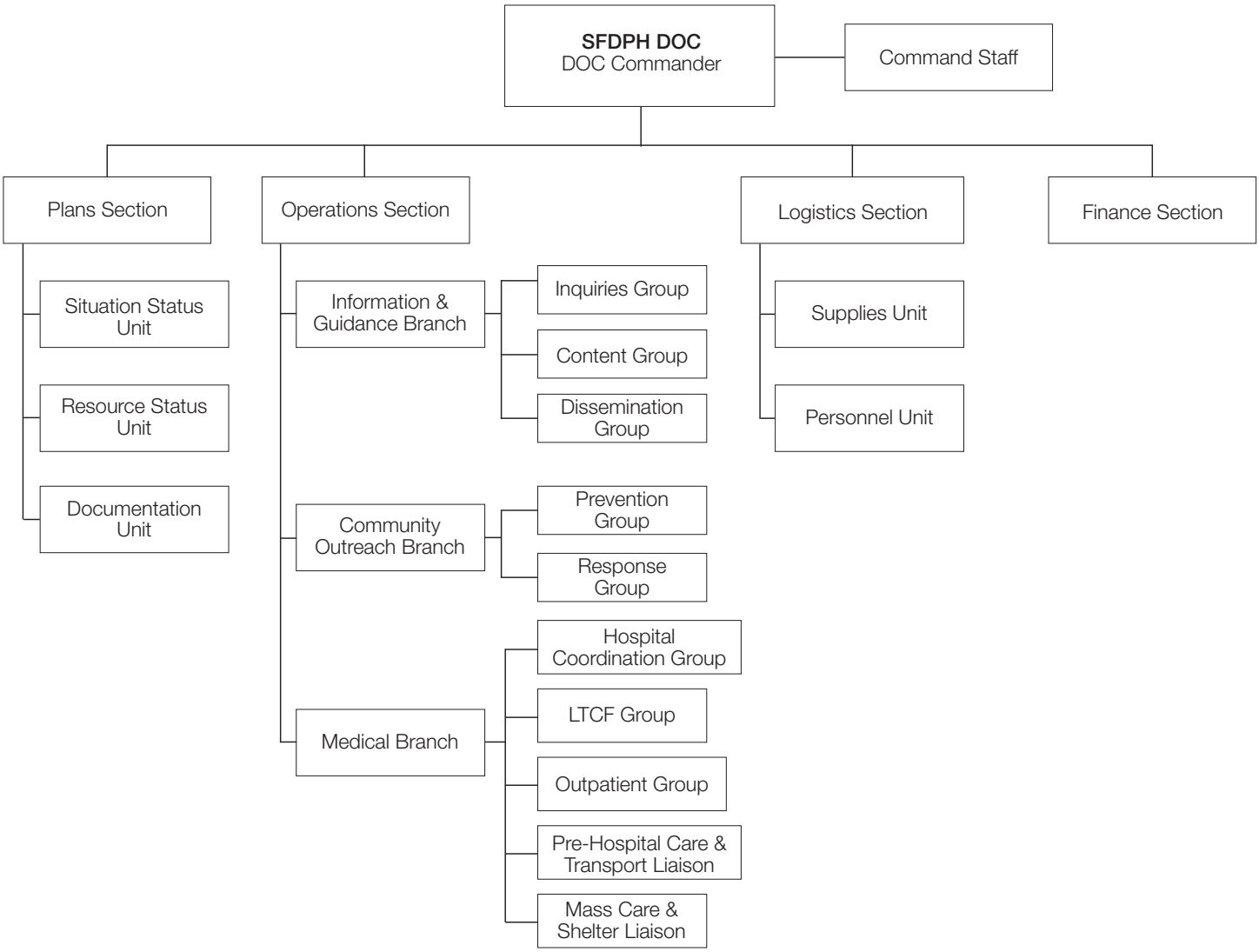
I. Suggested Department Operations Center (DOC) Organization



II. Overview

A. Extreme Heat Emergencies

Climate change is expected to increase temperatures, change precipitation patterns, increase the frequency and severity of extreme weather events, and increase sea-level rise—all of which will have significant impacts on San Francisco's environment, health, and economy. California is already experiencing the effects of climate change. Since 1920, average annual temperatures have been increasing across California, including in the San Francisco Bay Area.

The July 2006 California heat wave—which was felt in San Francisco—was the largest heat wave on record since 1948. While typical summer temperatures in California contribute to the untimely demise of 20 people on average per year, the heat wave experienced by California in July 2006 caused the death of at least 140 people statewide over a 13-day period. In San Francisco, the temperature during this period peaked at 95°F. Scientists predict that, due to climate change, extreme heat waves will become more frequent and more intense.

Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly take the lives of vulnerable populations. Excessive temperatures greatly impact the elderly, the sick, and the very young due to heat-related complications.

"Any individual, regardless of age, sex or health status can develop heat stress if engaged in intense physical activity and/or exposed to environmental heat (and humidity). Physiologic mechanisms maintain the core body temperature (i.e., the operating temperature of vital organs in the head or trunk) in a narrow optimum range around 37° C (98.6°). When core body temperature rises, the physiologic response is to sweat and circulate blood closer to the skin's surface to increase cooling. Over a period of one-to-two weeks, exposure to conditions that elevate body temperature – physical activity and/or environmental heat results in a process of physiological adaptation – "acclimatization". When acclimatized, the body produces more dilute sweat, and heart rate and body temperature increase less than when not acclimatized.

If heat exposure exceeds the physiologic capacity to cool, and core body temperature rises, then a range of heat-related symptoms and conditions can develop – from relatively minor treatable heat cramps to severe life threatening heat stroke, which is always an extreme medical emergency. Even when acclimatized, adequate hydration is critical to avoid the development of heat-related illness."

II. Overview

B. Heat-Related Health Conditions

The physiological consequences of extreme heat emergencies can present themselves in stages as described below:

Heat Cramps. Heat cramps usually affect people who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture. The low salt level in the muscles may be the cause of heat cramps. Heat cramps may also be a symptom of heat exhaustion. Heat cramps are muscle pains or spasms—usually in the abdomen, arms, or legs—that may occur in association with strenuous activity. If you have heart problems or are on a low-sodium diet, get medical attention for heat cramps.

Heat Exhaustion. Heat exhaustion is a milder form of heat-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. It is the body's response to an excessive loss of the water and salt contained in sweat. Those most prone to heat exhaustion are elderly people, people with high blood pressure, and people working or exercising in a hot environment.

Heat Stroke. Heat stroke occurs when the body is unable to regulate its temperature. The body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Body temperature may rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency

C. Vulnerable Populations

While everyone is at-risk of developing heat-related illness, certain populations are more at risk, such as people in highly dense neighborhoods, as well as the elderly and the homeless.

It typically takes human biology two weeks to adapt to temperature extremes. Since San Franciscans historically have not experienced extreme heat events for extended durations, the population – in particular the vulnerable groups mentioned above – has greater difficulty acclimating to long durations of extremely high temperatures. This causes an increased risk of heat stress and of heat related illness, which could subsequently result in death. Furthermore, the housing stock is also less likely to have central air conditioning both because of its age and because of the typically cooler climate.

D. Temperature Thresholds

According to historical weather and mortality data gathered by the National Weather Service (NWS) and the California Department of Public Health, there appears to be a significant increase in health risk (particularly to vulnerable populations) when temperatures "spike" for two or more consecutive days without an adequate drop in nighttime temperature to cool the outdoor and indoor environments. *For the City and County of San Francisco, an excessive heat event will be defined as daytime temperatures at or above 85°F*[1] *. This threshold is consistent with the 98th percentile of temperatures recorded over the past 10 years. However, additional factors (e.g. air quality, humidity, night time cooling, etc.) will need to be considered when determining further DPH action, as described below.*

[1] *The SFDPH Homeless Outreach Team (HOT) activates at a temperature threshold at or above 80°F.*

E. Activation & Notification Phases

The San Francisco Department of Emergency Management (DEM) Duty Officer is the designated individual to monitor National Weather Service (NWS) and temperature forecasts for the City and County of San Francisco. Select staff within DPH also receive NWS alerts.

In accordance with procedures and protocols outlined in DPH emergency plans, DPH will follow a tiered-level response for extreme heat events:

Optional Outreach Activities:*
*these may or may not occur throughout the year dependent on available resources and needs

- Send an email reminder to local community based organizations to initiate awareness campaigns: implement Train-the-Trainer Extreme Heat curriculum to educate staff and clients/constituents regarding heat illness and prevention methods
- Encourage DPH Units and Branches that regularly conduct home visit services to conduct heat education outreach – distribute heat brochures to nurses and other providers that conduct home visits
- Orient and train pre-identified DPH Department Operations Center (DOC) staff to this Extreme Heat Response Annex, and other related protocols and/or procedures

LOW Level – correlates with NWS Excessive Heat Outlook or Advisory

DPH DOC WILL NOT BE ACTIVATED.

Low Level actions may be implemented within 72 to 96 hours (3-4 days) prior to a forecasted extreme heat event. LOW Level actions may include the following:

- Designated DPH staff will be alerted by NWS and/or the DEM Duty Officer, and will keep key stakeholders apprised of weather conditions.
- Designated DPH staff will send an email reminder to key stakeholders to review heat response protocols and procedures.
- Review DPH Homeless Outreach Team (HOT) Protocol:

1. DPH HOT activates when temperatures are expected to be 80 degrees or higher.
2. Outreach becomes focused on areas of highest concentrations of homeless individuals (Tenderloin, South of Market, Mission neighborhoods). Outreach workers check on individuals on the street, especially on those at highest risk, i.e. people lying down in the sun, wearing layers of clothing, and those who have visible mental health, substance use or physical health conditions.
3. For clients who do not need medical treatment, offers of voluntary help to get indoors will be made. If cooling centers are open, individuals can be transported there.
4. Distribute bottles of water - during heat waves, this has been the most effective way to lessen impact of dehydration.
5. If individuals are suspected of suffering from hyperthermia/heat stroke, call 911.

- Obtain access to pre-existing databases/lists with concentrations of high-risk individuals in order to facilitate notification activities for MEDIUM or HIGH Level activities (e.g. childcare centers, residential care facilities, etc.)

II. Overview

MEDIUM Level – correlates with NWS Excessive Heat Watch
(Extreme heat will occur within next 72 hours)

DPH INCIDENT MANAGEMENT TEAM MAY BE ACTIVATED.

Medium Level actions are taken as a result of credible predictions by the NWS of extreme heat within the next 72 hours or of power outages during warmer than normal weather conditions. During this phase, coordination with regional and state agencies increases.

MEDIUM Level actions will be initiated when one or more of the following exists:

- The NWS issues a special weather statement for the City and County of San Francisco operational area predicting an Excessive Heat Watch.
- There are credible predictions of power outages, electrical blackouts, or rotating blackouts during periods of high heat.

MEDIUM Level actions include the following:

- DPH contacts DEM Duty Officer to confirm whether or not the City's Emergency Operations Center (EOC) will be activated.
- DPH Incident Management Team will convene to do the following:

1. Initiate public information efforts via communication through DEM, Human Services Agency (HSA), Department on Aging and Adult Services (DAAS), American Red Cross, and local community based organizations; communicate that extreme heat events are dangerous and conditions can be life-threatening.
2. Inform the public of anticipated extreme health event conditions: when will conditions be dangerous? How long will they last? How hot will it feel at specific times during the day?
3. Provide information and frequently asked questions to San Francisco 311 in anticipation of questions from the public. Consider use of 311 as an information phone line that can be used to inquire about heat-related health concerns.
4. Media messages to public should include recommendations to check on high-risk relatives and neighbors (e.g. sick and elderly individuals) throughout the day.
5. Determine whether DEM and/or other agencies will assist in disseminating information to public meeting areas, including but not limited to: churches, recreation centers, libraries, & schools.

- Contact DPH HOT to coordinate efforts to reach homeless population.
- In collaboration with Emergency Management System (EMS), notify hospitals and other healthcare facility partners of Excessive Heat Watch and possible increase in heat-related illness
- Verify use/availability of cooling center facilities (in partnership with DEM) for potential activation

Overview

HIGH Level – correlates with NWS Excessive Heat Warning
(Extreme heat event will occur within next 24 hours)

DOC MAY BE PARITALLY OR FULLY ACTIVATED. CITY EOC MAY ALSO BE ACTIVATED.

High Level actions are taken when one or more of the following exists in the City and County of San Francisco:

- The NWS issues a special weather statement for the City and County of San Francisco operational area predicting an **Excessive Heat Warning**
- Abnormal human medical emergencies and mortality due to excessive heat
- Extended power outages during expected excessive heat conditions

High Level efforts include urgent and comprehensive actions by the DPH DOC to complement and support local actions during the most severe heat event. **These actions include all of the above Medium Level activities, as well as:**

- Initiate activation of cooling centers, if appropriate.
- Coordinate periodic or daily calls as needed among the key San Francisco agencies (e.g. DEM, HSA), state agencies (California Department of Public Health, California Emergency Management Agency), and Region 2 constituents with weather and power updates as deemed necessary.
- Utilize San Francisco 311 system as an information phone line that can be used to inquire about heat-related health concerns.
- Assist in efforts to promote cooling centers to public, especially vulnerable populations.
  - May include dispatching DPH staff (e.g. HOT teams) to single room occupancy housing and/or vulnerable neighborhoods to go door-to-door (see list of vulnerable neighborhoods in Annex Appendix).
- Provide resource and communications support to hospitals and other healthcare facilities.
  - Resources may include water pallets, medical supplies and equipment to treat heat-related health conditions.
- Receive situation status updates from hospitals to help assess potential patient surge due to heat related illness.
- Provide resource and communications support to local community based organizations.
  - Resources may include provision of Train-the- Trainer curriculum, brochures.

E. Potential City Wide Impacts

Potential city wide impacts of an extreme heat emergency may include:

- Thousands of exposed and/or affected persons.
- Social activities, day-to-day business, and school may be interrupted due to voluntary or recommended closures.
- Widespread public concern.
- Overload of 911 system.
- Excess Emergency Department visits and excess hospitalizations due to heat-related causes.
- Increased respiratory and cardiovascular illness due to degraded air quality.

III. San Francisco Response Overview

A small extreme heat event may only require activation of a public health response. For complex and/or larger extreme heat emergencies that affect many people, coordination of local, regional, state, and federal agencies may be required.

A. Lead Response Agencies

In an extreme heat emergency, DPH will be the lead response agency and activities will be coordinated through the DPH Department Operations Center (DOC) in coordination with the city Emergency Operations Center (EOC), if activated. If other events are also occurring (e.g., earthquake response), DPH may share unified command with other partners.

Department	Responsibilities during an Extreme Heat
DPH	• Assess medical impact of heat event • Identify/inform city officials, medical community, responders, and the public of appropriate health precautions • Provide informational messages for, and outreach to, community based organizations and the public to protect and promote health • Coordinate with health care partners regarding medical surge related to heat • Initiate activation of cooling centers based on pre-established triggers • Monitor environmental health of conditions at cooling centers

B. Partner Agencies

City & County of San Francisco

In an extreme heat event, support may be required from other City departments, agencies and non-profit organizations, as well as local organizations. Key agencies include:

Department/Agency/Organization	Responsibilities
Human Services Agency (HSA)	• Lead role in coordinating cooling centers • Open, staff and operate emergency cooling centers • Communication with clients especially via the Department of Aging and Adult Services
American Red Cross	• Support cooling centers with ARC resources as available and appropriate

Support may also be required from additional City departments and agencies, including:

- Department of Emergency Management
- Fire Department
- Police Department
- Department of Public Works
- Public Utilities Commission
- Recreation & Parks Dept.
- Animal Care & Control
- 3-1-1
- Mayor's Office on Disability
- SF Unified School District
- SF CARD – Community Agencies Responding to Disaster
- Small Business Assoc.
- Neighborhood Emergency Response Teams (NERT)
- Medical Reserve Corps
- Other local CBOs

Regional/State/Federal Agencies

Coordination with regional, state, and federal agencies may initially occur via the EOC. Close ongoing communication and coordination may occur through the DOC. Key agencies may include:

- Local Health Departments
- Bay Area Air Quality Management District
- California Department of Public Health (CDPH)
- The Centers for Disease Control and Prevention (CDC)
- National Weather Service (NWS)
- National Oceanic and Atmospheric Administration (NOAA)

C. Scale and Scope of the Response

Extreme heat emergencies have the ability to cause significant morbidity and mortality in the population. Further, the emergency can escalate when contributors to heat vulnerability – described below – have not been addressed and/or are exacerbating the event. An aggressive public health response should attempt to address these contributors.

The scale and scope of the response will depend on the duration of the heat emergency, which could be a few days to several weeks. Key factors that could impact the scale and scope of the response include:

- Access to health care
- Ability to receive and understand educational/prevention information regarding heat emergencies
- Social isolation
- Underlying health conditions in the population (e.g. mental illness, chronic health conditions)
- Air quality
- Significant morbidity and/or mortality

IV. Public Health Response Overview

A. DPH DOC

The DPH DOC should be activated when the extreme heat emergency requires a response that exceeds (or has the potential to exceed) the management capacity of DPH designated staff and meets at least one of the following criteria:

- Extreme heat event (NWS Excessive Heat Warning) with potential for significant illness or death
- High profile public health situation
- Assessment by DPH that hospitals are impacted and DPH can support
- Cooling centers are needed

Department/Agency/Organization	Responsibilities
Human Services Agency (HSA)	• Lead role in coordinating cooling centers • Open, staff and operate emergency cooling centers • Communication with clients especially via the Department of Aging and Adult Services
American Red Cross	• Support cooling centers with ARC resources as available and appropriate

IV. Public Health Response Overview

B. Proposed DOC Structure

It is recommended that the DOC Functions checked in the table below be activated immediately. See the guidance below regarding additional functions to consider activating:

DOC Activation Priorities for an Extreme Heat Event - High Level Activation

Function	Activate Immediately
COMMAND	√
• DOC Commander	√
• Information Officer	√
• Safety Officer	√
• Liaison Officer	√
POLICY GROUP	√
PLANS SECTION	√
• Situation Status Unit	√
• Resource Status Unit	√
• Documentation Unit	√
• Technical Specialist Unit	
• Demobilization Unit	
OPERATIONS SECTION	√
Information & Guidance Branch	√**
• Inquiries Group	√
• Content Group	√
• Dissemination Group	√
Environmental Health Branch	consider*
• Hazmat Group	
• Food Group	
• Sanitation Group	
• Water Group	consider*
Community Outreach Branch	√
• Prevention Group	√
• Response Group	√

Function	Activate Immediately
Containment Branch	
• Community Mitigation Group	
• Restriction, Exclusion, & Clearance Group	
• Mass Prophylaxis Group	
• Isolation & Quarantine Group	
Medical Branch	√
• Hospital Coordination Group	√
• LTCF Group	√
• Alternate Care Group	consider*
• Outpatient Group	√
• Pharmacy Group	
• Pre-Hospital Care & Transport Liaison	√
• Mass Fatalities Liaison	consider*
• Mass Care & Shelter Liaison	√
Epidemiology, Surveillance, & Data Branch	consider*
• Investigation Group	
• Surveillance Group	consider*
• Data Group	consider*
Lab Branch	
• Lab Testing Group	
• Lab Receiving/Documentation Group	
LOGISTICS SECTION	√
• Personnel Unit	consider*
• Supplies Unit	√
• Facilities Unit	
• Communication Equipment Unit	consider*
• Info Technology Unit	consider*
FINANCE SECTION	√

* Consider activation if the response is large and/or requires coordination with city agency partners.
** Consider staffing Information & Guidance Branch with EH staff as subject matter experts in extreme heat events.

IV. Public Health Response Overview

C. Operational Goals, Objectives and Activities

Primary DPH DOC operational goals and objectives include:

Goals

- Assess the situation and threat
- Determine strategies to mitigate the threat and protect and promote health

Objectives & DOC Lead	Activities
Support provision of medical care Medical Branch	• Respond to requests for information, resources, and logistical support from medical providers. • If hospital and/or other facility surge plans have been activated and cannot meet population medical needs, activate field treatment sites. • Support cooling center medical needs.
Provide information and guidance Information and Guidance Branch	• Provide guidance to the medical community on diagnosis, treatment, and prevention. • Provide guidance to city officials, responders, and the public on the situation, prevention, treatment, and when to seek health care. • Provide information to the public regarding location of cooling centers.
Disseminate information & educate Community Outreach Branch	• Implement outreach and education strategies recommended by Information & Guidance Branch in community, with focus on most vulnerable neighborhoods & populations
Assess & provide technical expertise Environmental Health Branch	• Assess temperature and weather forecasts for City/County of San Francisco • Provide guidance on water usage • Collaborate with Bay Area Air Quality Management District to provide guidance on air quality
Investigate and survey Epidemiology, Surveillance, & Data Branch	• Conduct surveillance to obtain information about the extent of the heat emergency. • Determine the morbidity and mortality of high risk populations.
Support cooling center activation Logistics Section	• Support activation of cooling centers (e.g. identification of supplies). • Support medical resource requests. • Support personnel needs and requests.

V. Additional Response Considerations

The DPH Emergency Operations Plan (EOP) is the primary functional response guide for all DPH emergency response activities. However, because of the unique nature of an extreme heat event, the following modifications and/or considerations should be considered and applied when necessary to the appropriate operational section of the EOP.

A. Command Staff

- Liaison Officer should be the single point of contact to American Red Cross (ARC), HSA, and other key stakeholders and partners outside of DPH. An exception to this is any activated cooling centers (Mass Care and Shelter Liaison in Medical Branch is point of contact with individual cooling center sites and may liaise with ARC representative at the EOC to receive updates.)
- As appropriate, the Safety Officer should provide recommendations on prevention of heat-related health conditions for responders and DPH staff who may be exposed to high temperatures for extended periods of time during the extreme heat event.

B. Policy Group

- As much as possible, policies should be similar across the City and County of San Francisco, as well as the region. Work with other City Departments such as the Department of the Environment and regional policy groups such as the Association of Bay Area Health Officials (ABAHO) to develop guidelines.
- Policy Group should consider the following critical issues:
  - School/daycare closures
  - Possible reassignment of City employees who work outdoors
  - Cancellation of outdoor events

C. Operations Section

Information & Guidance Branch

- If the extreme heat event is occurring regionally, coordinate information and guidance regionally.
- Consider that most heat-vulnerable populations will have limited access to health care, are socially isolated, and/or have an impaired ability to receive and/or understand heat information and guidance.
- Educate medical providers on providing ICD-9 code documentation pertaining to heat-related illness.

Environmental Health Branch

- It may be necessary for the Water Group to provide guidance on water usage to the public.
- It may be necessary for this Branch to provide guidance on air quality issues.

Community Outreach Branch

- The Community Outreach Branch may be used to assist in efforts to visit the City's SRO's and most vulnerable neighborhoods to promote heat reduction strategies and/or movement to cooling centers.

Medical Branch

- The Mass Care and Shelter Liaison may serve as a link to any activated cooling centers, to receive and report situation status updates and resource requests. The Mass Care and Shelter Liaison may liaise with ARC representative at the EOC to receive updates on cooling center operations.

Data Branch

- Consider conducting an analytic study to determine the impact of the heat event locally.

V. Additional Response Considerations

D. Logistics

- Consider transportation needs to transport seniors or others to cooling centers.
- Anticipate resource requests from healthcare facility partners for water and other cooling supplies.

E. Plans

- No additions to the core EOP.

F. Finance

- No additions to the core EOP.

VI. Resources

Items	Location
Lists/Maps	
Cooling Center List	
High-risk CCSF populations/neighborhoods	
Excessive Heat Event Education: Other Education/Outreach Materials	
Train-the-Trainer Extreme Heat Curriculum	
Extreme Heat FAQs	