Port of Oakland
Wildfire Mitigation Plan
December 2021

INTRODUCTION

This Wildfire Mitigation Plan (WMP) presents the Port of Oakland's Plan for mitigating risks of wildfire ignition from its electrical utility infrastructure. The Plan follows the guidance and requirements of SB901, Section 42, amending Public Utilities Code (PUC) Section 8387. PUC Section 8387 was amended on July 12, 2019 as a result of the signing of California's Assembly Bill (AB) 1054 into law. AB 1054 requires that after January 1, 2020, each publicly owned utility (POU) or electric cooperative submit, by July 1 of each year, a WMP to the California Wildfire Safety Advisory Board. The bill also requires each POU to comprehensively revise its plan at least once every three years.

The WMP describes the range of activities that the Port is taking to mitigate the threat of power-line ignited wildfires, including its various programs, policies, and procedures (Plan). This Plan is subject to policy direction and oversight by the Port's Board of Commissioners and is implemented by the Executive Director.

The Port is an independent department of the City of Oakland, established through the City of Oakland (City) Charter in 1927. The Port is governed by and through the Board of Port Commissioners. The Port owns and operates the Oakland International Airport (OAK), owns and leases facilities in the Oakland Seaport, and owns and leases commercial real estate holdings located along the San Francisco Bay between the Seaport and OAK. The Port of Oakland (Port) is a local publicly owned utility operating its own system of electrical lines, equipment, and other facilities to provide electric utility service to its own facilities and tenants at OAK and its own facilities and a portion of its tenants at the Oakland Seaport.

ELECTRICAL SYSTEM, OPERATING ENVIRONMENT, AND LAND USE

Power to the Oakland Seaport is provided at 115kV and 12 kV from PG&E's Substations C and L. OAK receives power from PG&E's Edes Substation with a 12kV connection. In both the Oakland Seaport and OAK areas, the Port owns and operates substations, metering and other distribution infrastructure. At OAK power lines are undergrounded. At the Oakland Seaport, the Port has less than 3 miles of overhead lines (rated at 12 kV), located in a flat, paved area with very few adjacent (palm) trees that are maintained to provide the required clearances[1]. All other areas of the Oakland Seaport served by the Port's utility have underground lines.

[1] The Port maintains vegetation clearances in accordance with GO95, PRC 4292, and 4293. See Vegetation Management page 9 of the Plan.

The City of Oakland Fire Department (OFD) is responsible for fighting fires in all areas of the Port. The Port contracts for dedicated response at OAK and maintains Aircraft Rescue and Fire Fighting facilities on the airfield of the Airport.

The Port has designated three Emergency Operations Centers (EOC), two located at OAK and one located at the Port's Administrative offices located at 530 Water Street. Depending on the nature of the emergency one or more EOCs may be activated that will work cooperatively with the City's EOC to handle a variety of emergencies including wildfires.

Both OAK and the Oakland Seaport are primarily paved areas with limited vegetation and structures. The nature of the transportation infrastructure the Port provides for aviation and maritime use requires large flat paved surfaces. Vegetation is mostly limited to isolated plants, bioswales or bushes between paved areas or in wetlands. The Oakland Seaport is virtually all paved or graded with the exception of two maintained parks. Non-paved areas at OAK consist primarily of several hundred acres of wetlands, and graded areas consistent with Federal Aviation Administration safety requirements. Adjacent land uses are dominated primarily by the San Francisco Bay and the urban communities of West and East Oakland, San Leandro, and Alameda. Significant trees are specifically prohibited and managed in the vicinity of OAK due to FAA requirements for air safety.

The design of the airport and seaport utility infrastructure, extensive paved areas, lack of vegetation and wetlands/ponds, and maintenance regimes serve as significant mitigations against the possibility of wildfires resulting from the Port's electric utility infrastructure.

WMP ELEMENTS

Responsibilities *(CPUC 8387, b2A)*

Roles and responsibilities for development, maintenance, and implementation of the WMP:

- Board of Commissioners – Review and approve the Plan
- Executive Director – Direct Port resources to ensuring the Plan is implemented, evaluated, and maintained
- Directors of Maritime and Aviation – Responsible for communications to the Port's tenants within the Oakland Seaport and OAK respectively
- Harbor and Airport Facilities Managers – Responsible for vegetation management, and maintenance of utility infrastructure
- Manager of Utilities Administration – Responsible for the development and maintenance of the Plan, collection of relevant data necessary for the implementation of this Plan, tracking metrics to determine the Plan's effectiveness

Objectives of the Plan *(CPUC 8387, b2B)*

The objectives of this WMP are to:

1. Minimize the probability that Port of Oakland's transmission and distribution system may be the origin or contributing source for the ignition of a wildfire
2. Implement a WMP that reflects that safety, prevention, mitigation, and recovery are central to the goals of the Port of Oakland
3. Ensure the Port of Oakland maintains a WMP that is consistent with State law and objectives

Geographic Area ***(CPUC 8387, b2K)***

As can be seen from Figure 1, the Port utility infrastructure is not located within the areas of the City designated by OFD as high fire severity zones. Staff consulted with OFD's Vegetation Management Unit, and OFD concurs that the Port's overhead electrical lines and equipment are not in an area with a significant risk of catastrophic wildfire.

Historically, there has not been a wildfire in the Port area. The OFD map (Figure 1) shows that the Port is approximately five miles or greater from the nearest OFD-designated high fire severity area, and the CPUC Fire-Threat map (Figure 2) shows the Port utility infrastructure is also approximately five miles or greater from any area with an elevated risk and further from any area with an extreme risk for utility-associated wildfire.

Figure 1: City of Oakland High Severity Zone Map

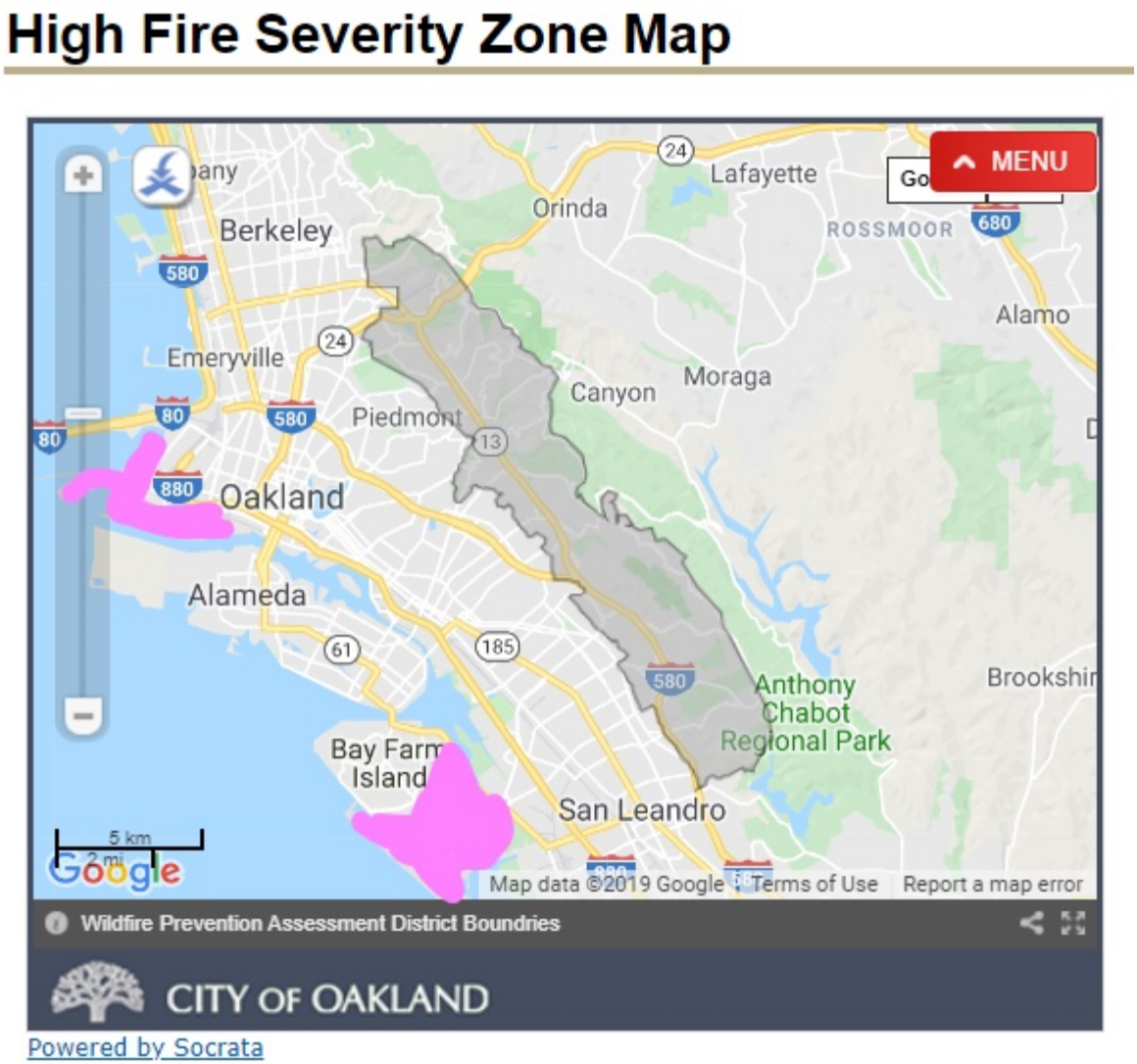
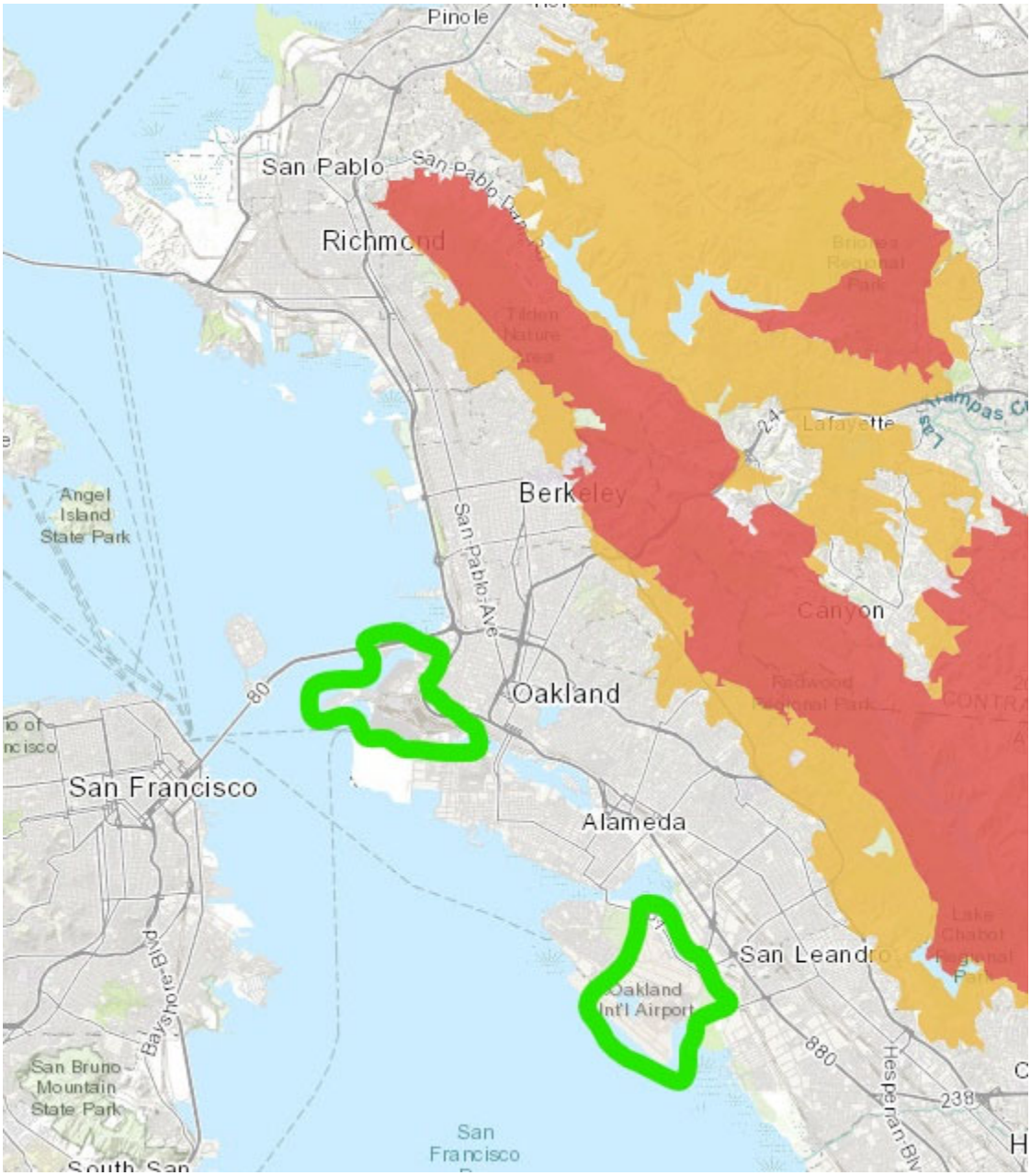


Figure 2: CPUC Fire Threat Map



Risks and Risk Drivers *(CPUC 8387, b2J i and ii)*

Design and construction of electrical infrastructure at the Port of Oakland comply with the requirements of: the Institute of Electrical and Electronics Engineers IEEE C2, *National Electrical Safety Code*; National Electrical Contractors Association (NECA) 1, *Standard Practice of Good Workmanship in Electrical Construction*; National Fire Protection (NFPA) NFPA

70, *National Electrical Code*; National Fire Protection (NFPA) NFPA 70E, *Standard for Electrical Safety in the Workplace*; Underwriters Laboratories (UL), *Labels*; National Electrical Manufacturers Association (NEMA), *Standards as Applicable*; International Electrical Testing Association (NETA), NETA STD ATS, *Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems*; and the California Electric Code (CEC) as adopted by the City of Oakland. The Port also complies with the standards defined in General Order 95.

The Port, located along the San Francisco Bay, consists of mostly paved areas and limited vegetation. Therefore, the typical wildfire risks do not exist at the Port or Oakland. Wildfire risks and their characterization in the Port Utility areas include the following:

- Extended drought - low risk due to limited vegetation isolated by paved and graded areas and open water/wetlands
- Vegetation type – low risk due to isolated areas of vegetation, irrigated landscaping, and limited isolated trees and brush
- Vegetation Density – low risk due to very low density and maintenance requirements for safe operations where vegetation exists
- Terrain – low risk as virtually all areas are flat and primarily paved or graded to serve their intended transportation purpose
- Communities at Risk – low risk as residential communities are separated from the Port area by highways, railyards or industrial areas
- Fire History – low risk as there is no known history of wildfires occurring in the Port area
- Overhead power lines – low risk as no overhead lines exist at OAK and the majority of the Oakland Seaport does not have overhead lines.
- Changing Weather Patterns (Climate Change)
- Weather
- High winds

Preventative Strategies and Programs in Place or to be Adopted *(CPUC Section 8387, 2C)*

The Port's preventative strategies and programs include several elements fundamental to the nature of its transportation operation infrastructure in addition to strategies and programs related to design, construction, operations, and maintenance of the electrical system and staff training. These elements include:

- Minimizing landscaped and vegetated areas on its property, typically limited to irrigated landscaping or environmentally sensitive habitats such as wetlands not in the vicinity of utility infrastructure
- Minimizing overhead power lines

- Maintenance protocols by dedicated Facilities staff to inspect and perform preventative and as needed maintenance on the electrical system
- Use of a computerized maintenance management system to track maintenance work and provide maintenance schedules
- Incorporating inspection and maintenance requirements provided in CPUC GO 165 and CPUC GO 95, Rule 18 into current inspection protocols and schedules
- Weekly, monthly, and annual infrastructure inspections depending on the element of the system
- Instituting preventative maintenance work orders for Vegetation Management in accordance with CPUC GO 95 (see "Vegetation Management" below)
- Tracking weather related to potential fire risk and specific environmental and geographical conditions and communicating relevant information and alerts to staff and tenants for vigilance of increased wildfire potential
- Monitoring drought conditions and other relevant factors throughout the year to determine if more frequent inspections are required
- Provide extensive safety training Port staff on the electric utility environment and proper operating conditions and maintenance protocols to prevent fires

Metrics to Evaluate the WMP ***(CPUC 8387, b2D)***

The Port will evaluate the WMP's performance through the use of the following metrics:

Metric 1: Fire Ignitions

For purposes of this metric, a fire ignition includes the following:

- A Port facility was associated with the fire
- The fire was self-propagating originating from a material other than electrical or communication facilities
- The resulting fire traveled greater than one linear meter from the ignition point; and
- The Port knew that the fire occurred

Metric 2: Wires Down

The second metric is the number of distribution and transmission wires downed within the Port's service territory. For purposes of this metric, a "wires down event" includes any instance where an electric transmission or primary distribution conductor falls to the ground or on to a foreign object.

Metric 3: Annual Inspection/Documentation of Plan Conformance

The Port will annually inspect compliance with maintenance and vegetation management protocols by visually inspecting vegetated areas and reviewing maintenance

records and completed work orders. This metric will evaluate the level of conformance with the plan.

Previous Metrics Used ***(CPUC 8387, b2E)***

This is the first year of a Port WMP. Therefore, there are no previous metrics.

Protocols for Disabling Reclosers and Deenergizing ***(CPUC 8387, b2F)***

The Port does not have automatic reclosers. If a circuit opens, Port staff manually inspects, contacts the tenant if relevant, and, if safe, reenergizes the line. The Port does not have a SCADA system. When power needs to be shut off due to planned or unplanned maintenance, the Port follows procedures to ensure safety and the expedited restoration of service through its standard protocols and training of staff on those work safety protocols. All transmission lines to the Port distribution lines are owned by PG&E. If PG&E shuts off power to the Port service area due to a wildfire event, Port staff will work to protect its distribution equipment and the grid from the effects of a sudden power loss and restoration.

Procedures for Customer Notification ***(CPUC 8387, b2G)***

The Port has a three Emergency Operations Centers (two at OAK and one in Jack London Square), staffed 24/7. The Port has a robust Emergency Notification System (ENS), and official public bulletins, which is utilized routinely to notify tenants and staff of operational incidences and impacts in the OAK. The Port will also utilize this system to similarly notify tenants and staff in the Oakland Seaport. Some Port customers will be contacted by the Port Utilities Department or by one of the Port's business units as appropriate. The Port continuously updates its emergency contact list for all tenants.

Vegetation Management ***(CPUC 8387, b2H)***

As previously described, there is very little vegetation in the Port area. Much of the existing vegetation is in wetland areas, graded or mowed areas, or irrigated landscaping. This alone is probably sufficient to ensure no vegetation will assist in fueling a wildfire if an electrical power line has a failure. However, the Port also meets or exceeds the minimum industry standard vegetation management practices related to the electric utility infrastructure it owns and maintains. For both transmission and distribution level facilities, the Port meets: (1) Public Resources Code section 4292; (2) Public Resources Code section 4293; (3) GO 95 Rule 35; and (4) the GO 95 Appendix E Guidelines to Rule 35. The Port complies with these standards even though they relate to High Fire Threat Districts, which the Port is not located in. The recommended time-of-trim guidelines do not establish a mandatory standard, but instead provide useful guidance to utilities. The Port will use specific knowledge of growing conditions and tree species to determine the appropriate time of trim clearance in each circumstance. The Port currently has an active landscape management plan across its territory and complies with the requirements of Rule 35 in the Port utility infrastructure area.

GO 95, Rule 35, Table 1					
Case	Type of Clearance	Trolley Contact, Feeder and Span Wires, 0-5kv	Supply Conductors and Supply Cables, 750 - 22,500 Volts	Supply Conductors and Supply Cables, 22.5 - 300 kV	Supply Conductors and Supply Cables, 300 - 550 kV (mm)
13	Radial clearance of bare line conductors from tree branches or foliage	18 inches	18 inches	¼ Pin Spacing	½ Pin Spacing
14	Radial clearance of bare line conductors from vegetation in the Fire-Threat District	18 inches	48 inches	48 inches	120 inches

Appendix E
Guidelines to Rule 35

The radial clearances shown below are recommended minimum clearances that should be established, at time of trimming, between the vegetation and the energized conductors and associated live parts where practicable. Reasonable vegetation management practices may make it advantageous for the purposes of public safety or service reliability to obtain greater clearances than those listed below to ensure compliance until the next scheduled maintenance. Each utility may determine and apply additional appropriate clearances beyond clearances listed below, which take into consideration various factors, including: line operating voltage, length of span, line sag, planned maintenance cycles, location of vegetation within the span, species type, experience with particular species, vegetation growth rate and characteristics, vegetation management standards and best practices, local climate, elevation, fire risk, and vegetation trimming requirements that are applicable to State Responsibility Area lands pursuant to Public Resource Code Sections 4102 and 4293.

Voltage of Lines	Case 13	Case 14
Radial clearances for any conductor of a line operating at 2,400 or more volts, but less than 72,000 volts	4 feet	12 feet
Radial clearances for any conductor of a line operating at 72,000 or more volts, but less than 110,000 volts	6 feet	20 feet
Radial clearances for any conductor of a line operating at 110,000 or more volts, but less than 300,000 volts	10 feet	30 feet
Radial clearances for any conductor of a line operating at 300,000 or more volts	15 feet	30 feet

The Port performs an evaluation of trees that have the potential to strike overhead facilities if they were to fall. The Port also performs more frequent and detailed inspections of any such trees. In cases where "hazard trees" (dead, dying, diseased or leaning) could strike the facilities, the Port will remove, or work with the landowner to remove, the tree or portion of the tree that poses a risk.

Inspection of Electrical Infrastructure ***(CPUC 8387, b2I)***

Annual inspections of the electrical infrastructure are currently performed by Port facilities staff.

Methodology for Enterprise wide safety and wildfire risk ***(CPUC 8387, b2L)***

Safety is paramount to the Port. Risks associated with fire, including wildfire, are incorporated into the Port's design, construction, maintenance, and operations. Also, as part of ascertaining the level of enterprise risk of wildfire, the Port reviewed historic outages in the Port caused by animals, birds, vegetation, car-pole accidents, and overhead equipment failures. Generally, these are not viewed as posing a meaningful risk of igniting wildfires due to lack of vegetation near the source of the risk. The potential risks and this mitigation plan are presented to the Board of Port Commissioners and the Port's senior staff as well all relevant staff who need to be trained in aspects of the Plan.

Restoration of Service After a Wildfire ***(CPUC 8387, b2M)***

Safety of the public, tenants, and staff is the Port's highest priority. The sequence for service restoration includes the following:

- Port crews complete an assessment of the overall system and focus on repairing major lines and substations. Crews must also clear hazards such as snapped or leaning utility poles.
- Port crews focus on restoring power to key services essential to community safety, health and welfare—such as fire and life safety systems, pumps, security areas, substations, cranes, etc.
- Repair priorities are based on the electrical facilities that will return service to the largest number of customers in the shortest period. Once crews restore major circuits, they then turn their attention to system repairs that affect fewer customers.
- Port crews must repair damaged substations and main electric lines and wires that feed power to all Port locations, followed by repairing, downed or damaged wires between utility poles and individual service lines.

Monitor, Identify Deficiencies, and Audit ***(CPUC 8387, b2N i, ii, iii)***

Based on feedback from Port staff, the independent evaluator, and Port tenants, , Port staff will modify this wildfire mitigation as needed. Changes will be incorporated, reviewed, and

presented to the Board of Commissioners at least annually for approval. The Plan may also from time to time be audited by the Port's internal auditor.

Although the Board of Port Commissioners reviewed the draft WMP, the Board did not formally adopt the WMP and it was posted on the Port website as a draft plan. Rule 35 has been added to the Port's planning documents.

The Port has emergency operations plans that are updated as needed, and according to federal regulations where appropriate, and cover varying emergencies such as weather, accidents, terrorism, earthquakes, and civil disobedience. The Port also exercises its plans with annual tabletops and major live emergency drills at least every three years. Inspecting locations for potential hazards is an on-going task at the Port. This Plan and the Emergency Operations Plans will be coordinated.

Public Review and Approval ***(CPUC 8387, b3 and c)***

This Plan will be presented to Port Board of Commissioners on an annual basis at a duly noticed public meeting. A qualified independent evaluator will review this Plan and provide the Port Board of Commissioners a report that will also be available on the Port website in compliance with Public Utilities Code section 8387(c). The independent evaluator will have experience in assessing the safe operation of electrical infrastructure to review and assess the comprehensiveness of this Plan.