

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER 95-018

SITE CLEANUP REQUIREMENTS FOR:

CITY AND COUNTY OF SAN FRANCISCO

and

SAN FRANCISCO INTERNATIONAL AIRPORT TENANTS:

AIRLINE TENANTS:

American Airlines
Delta Airlines, Inc.
Federal Express
Japan Airlines
Quantas Airways
Trans World Airlines
United Airlines

CONCESSIONAIRES:

Avis Rent-A-Car System, Inc.
The Hertz Corp.
National Car Rental System, Inc.

AVIATION SUPPORT TENANTS:

Chevron U.S.A Inc.
Chevron Corporation
Ogden Allied Ground Services
P.S. Group, Inc.
Santa Fe Pacific Pipeline Partners, L.P.
Shell Oil Company
Signature Flight Support-San Francisco, Inc.
Unocal Corporation

GOVERNMENT AGENCIES:

United States Coast Guard
Federal Aviation Administration

FOR THE PROPERTY AT:

**SAN FRANCISCO INTERNATIONAL AIRPORT,
SAN MATEO COUNTY**

FINDINGS

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Regional Board), finds that:

1. SITE DESCRIPTION

- a. Site Ownership / Location The site is owned by the City and County of San Francisco which operates the San Francisco International Airport. Although it is owned by the City and County of San Francisco, it is located within San Mateo County and is bounded by the cities of South San Francisco, San Bruno, Millbrae, and Burlingame (see Figure 1).
- b. Airport Operations The Airport Commission is the governing body in charge of overseeing all airport activities. In order to facilitate airport

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operations, the Airports Commission leases out and issues permits for the use of parcels, known as plots, within the airport boundaries to various airlines, aviation support companies, and concessionaires, such as ground transportation companies, who operate within their leasehold agreement areas. In addition, the Airports Commission leases out or issues permits for other areas to agencies such as the federal government. The areas and agreements change depending upon the needs of both the Airport Commission and tenant operations.

- c. Adjacent Properties Land uses in the area vary depending upon which side of the airport. The San Francisco Airport is bounded on the north by San Bruno Channel. Directly across the channel is a commercial / industrial area which includes the Shell bulk terminal, the San Bruno sewage treatment plant and a shopping center. The San Francisco Bay lies to the east of the airport and the runways actually extend into the Bay itself. To the south is a park where jogging trails and a wetland area are surrounded mainly by hotels servicing airport travelers. To the west, directly adjacent to the airport, are federal jurisdictional wetland areas that provide habitat for the red legged frog, a potential candidate for threatened species list. This small wetland area continues on the other side of the Bayshore freeway (Highway 101) which runs parallel to the airport. Beyond this wetland to the west are residential neighborhoods.

2. SITE HISTORY, PRESENT AND FUTURE USAGE:

- a. The San Francisco International Airport has been in existence since the 1920's when it began as a small airfield. Through reclamation of baylands, filling of the Bay, and acquisition of adjacent property, it has expanded to its current size of approximately four and one half square miles.
- b. Historical and current property use include passenger transport both via air and ground support vehicles, cargo transport and associated facilities operations, maintenance operations for both airplanes and ground support, a U.S. Coast Guard facility, a fuel distribution depot, a pressurized aircraft fueling network, a materials testing laboratory, storm water holding basins, a domestic waste water treatment plant, and an industrial waste water treatment plant. In addition, the Airport was also used as a military airfield, including barracks, during World War II. Five of these facilities are currently regulated under other Board orders (three SCRs and two NPDES). Those Orders shall remain in effect, in addition to the requirements of this Order.
- c. The airport is undergoing a major expansion project which will result in an approximately 35% increase in total building square footage and

increase its passenger handling capacity significantly. As part of this \$2.4 billion expansion project, the airport has been systematically evaluating (i.e. plot by plot) the environmental conditions of the airport properties. To date, numerous investigations have been performed under the direction of both the Airport Commission staff and the tenants. As a result, certain areas have been found to contain pollution within the subsurface soils that could or do affect ground water as well as the ground water itself. Board staff have been working with the airport staff and the tenants to determine the extent of pollution within these areas. A description of the subsurface investigations performed to date is outlined within Finding 6. of this Order.

3. REGULATORY STATUS AND DESIGNATION OF DISCHARGERS

Airport and tenant studies and investigations have found that both soil and ground water at the Site(s) have been polluted by oil and grease, total petroleum hydrocarbons as gasoline (TPH-g), jet fuel (TPH-j), diesel (TPH-d), benzene (B), toluene (T), xylene (X), and ethyl-benzene (E), volatile organic compounds (VOCs), tetrachloroethylene (PCE), trichloroethylene (TCE), cis and trans 1-2 dichloroethene (1,2-DCE), 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethane (1,2-DCA), vinyl chloride, methylene chloride, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, isopropylbenzene, 4-isopropyltoluene, n-propylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, acetone, 2-butenone, polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PNAs) and various heavy metals.

Due to the airport expansion project, many of the lease agreements and permits will be changing to accommodate the new airport facilities and as a result many of the tenants are changing locations to meet the needs of the new airport layout. Cleanup, especially soil cleanup under the new proposed facilities and the installation of necessary soil and/or ground water treatment systems should be accomplished prior to the construction activities which will be occurring over the next few years.

Orders, direction, and requirements of the Board are needed now to facilitate cleanup consistent and coordinated with the airport expansion.

a. City and County of San Francisco

Many of the Airport facilities that have contributed to pollution at the Airport are operated primarily through leases and other agreements for use of the premises by tenants, permittees, and owners. The City and County of San Francisco is considered a discharger because it owns the entire airport and has operated various facilities, such as a laboratory and

a combined industrial and storm water system, that have contributed to soil and ground water pollution at the site.

- b. Other Dischargers: Airline Tenants, Aviation Support Tenants, Concessions, and Governmental Agencies: (See above listing at beginning of the order)

The Airline Tenants, Aviation Support Tenants, Concessions, and Governmental Agencies are considered dischargers because their operations have caused or contributed, or threaten to cause or contribute, discharges to soil and ground water pollution at one or more of the plots at the site. *(See Finding 6 - Subsurface Investigations for details regarding pollution responsibility, location, source activity and type.)*

- c. The City and County of San Francisco and the Tenants are hereinafter referred to as the "Dischargers".
- d. The designation of who is a Discharger at a given site on the Airport may change depending upon new information supplied. In addition, the Regional Board may consider the use of "Primary Discharger" and "Secondary Discharger" where requested and found appropriate. Under Board Policy, the Executive Officer may make amendments to this Order to change Discharger status.

4. SCOPE OF THIS ORDER:

- a. Rationale for Airport Wide Site Cleanup Requirements In order to ensure a consistent and adequate cleanup that is coordinated with airport expansion and to implement the Regional Board's Non-Attainment Area policy, an airport wide cleanup and management strategy is appropriate. The following benefits are available utilizing an airport wide cleanup and management strategy:

- Cleanup consistency for similar sites with similar water quality, public health, and environmental threats that can be coordinated with airport expansion plans
- Streamlining of regulatory requirements and oversight for both the Dischargers and the Regional Board that could lead to a "partnership" approach
- Economies of scale for both the Dischargers and Regional Board in the areas of investigation, remediation design and implementation, monitoring, and regulation and oversight
- Level of effort and priority can match threat level for both Dischargers and Regional Board

- Encourages Tenants and the Airport to work together, especially in areas where there are commingled pollutant plumes, in the sharing of information, and in providing coordinated, consistent representation between the Regional Board and Dischargers.

This Order provides the framework to implement an airport wide cleanup and management strategy.

- Airport Wide Cleanup and Management Strategy** This strategy is based both on surface and ground water quality objectives and risk management considering the protection of human health and the environment, water quality in the surrounding San Francisco Bay, adjacent surface waters, and wetlands, as well as the protection of the useable ground water, especially the lower aquifer (the Westside Basin). It utilizes concepts similar to the Non-Attainment Area (NAA) policy recently (re)adopted by the Board as part of the August 1994 Basin Plan amendments.
- Non-Attainment Areas** The Non-Attainment Area concept was developed from Regional Board and other documented nationwide agency and responsible party experiences that cleanup to background is often impracticable; that most pollution of soil and ground water is limited in extent; that dissolved phase ground water cleanup to low levels is costly compared to the benefits; that some pollutants (TPHs especially) will naturally degrade given time; and that polluted sites in limited risk areas can be managed to prevent risk to water quality, public health and the environment without cleanup to background. NAA provides the Regional Board and Dischargers with an acceptable cleanup management option for polluted soil and ground water cleanups for sites with limited risk. With the information available at this time, the Regional Board believes that the San Francisco International Airport can utilize the NAA concept to manage its polluted soil and ground water cleanups. To ensure the protection of beneficial uses of useable ground water under the site and adjacent surface waters and the public health and environment, the Regional Board will require the Dischargers to develop a cleanup strategy for adequate pollutant source removal to limit further discharges of waste in addition to a plan to contain and manage the existing and/or remaining polluted soil and ground water. To document compliance, the Board will require a long term ground water monitoring program to ensure that the pollutant plume(s) is stable and is not exceeding the water quality objectives at the designated compliance monitoring points. These monitoring locations may be located at or adjacent to plume boundaries, along the preferential pathways, and at other appropriate locations as needed.

- d. **Remediation Management Zones** This Order establishes the concept of Remediation Management Zones (RMZ) for distinguishing different soil and ground water cleanup objectives appropriate to the risk to water quality, public health, and the environment. (The zones are shown on figure 3.) These zones are established in part by utilizing the information obtained during the United Airlines Plot 1 investigation and remediation.

Designation of RMZs includes the following factors:

- Assumes, although from limited sampling, that the bay mud layer which separates the upper water bearing zone (A-Fill Zone) is contiguous across the entire airport and will act as a barrier which will limit the vertical migration of ground water pollution from the A-fill zone into the lower zone drinking water known as the Westside Basin. This assumption needs to be verified.
- As part of the Plot 1 work, an ecological evaluation and risk assessment was conducted. It included the identification of sensitive ecological areas that might be impacted due to the migration of polluted ground water. In order to evaluate the possible adverse affects to aquatic organisms which may be exposed, a series of bivalve development tests were performed using total petroleum hydrocarbon impacted soil. Although these studies are not adequate to determine an exact cleanup number due to the small number of tests conducted, they do indicate that low concentrations do have significant adverse affects of the developing bivalves that are representative of the species living within the San Francisco Bay. The results of this study will aid in the determination of cleanup objectives within the Remediation Management Zones. Further evaluation of specific organisms may be performed by the dischargers if they desire to recommend different cleanup objectives.
- Also as part of the Plot 1 work, the study looked at possible mechanisms of transport within the subsurface. It was found that preferential pathways such as storm drain, fuel hydrant, and utility lines were the major mechanisms for polluted ground water transport. In addition, a human risk assessment was performed to identify the risk to future construction workers who may be exposed to residual soil pollution within the expansion project area. Additional risk and exposure analyses will be necessary to determine possible exposure of the workers within the newly constructed building and terminal areas.

The zones as shown on Figure 3 are considered draft and are subject to change in accordance with the findings of Task 3. The final number of zones and their respective boundaries will be determined in a subsequent Order. Zone boundaries will have some flexibility to accommodate

situations where a given site may fall into several zones. Cleanup objectives and levels for soil and ground water for the individual Remediation Management Zones are discussed below.

- e. **Cleanup Levels - Soils:** Implementing the NAA concept, the cleanup goals for on-Site polluted soils will be based upon meeting water quality objectives at compliance monitoring points while considering the possibility of ongoing limited leaching to ground water, the possible vertical movement to the Westside Basin; and the migration potential laterally to the Lower San Francisco Bay and adjacent wetlands; and the risk to human health and the environment. Human health considerations for onsite construction workers are important for areas where excavation will be required for the expansion project or future projects as well as occupational vapor exposure to future workers in the new buildings. Other concerns include the results of the bivalve bioassay tests conducted in September 1993 as part of the ecological assessment by United Air Lines at Plot 1 UST area; the integrity of the bay mud as a barrier to vertical movement of ground water; and the proposed BART underground tunnel location requiring flexible cleanup objectives because the tunnel bore may penetrate the bay mud aquitard that is separating the polluted shallow zone from the Westside Basin.

The soil cleanup objectives will be designated by Remediation Management Zones. The soil cleanup levels are expected to be more stringent as the distance to the Bay or an adjacent wetland decreases. For example, the soil remedial goal for Remediation Management Zone 1 will be more stringent than Remediation Zone 2, etc. These areas are indicated on Figure 3. Zone specific remedial cleanup goals for each pollutant including TPH, metals, solvents, PCBs, and PNAs, will be established in subsequent Order(s) based in part upon technical reports from the Dischargers. The cleanup objectives for reuse onsite of remediated soils will also be established in subsequent Order(s).

If any pollutants are left in the soil in concentrations in excess of the cleanup levels, follow up ground water monitoring may be required.

- f. **Cleanup Levels - Ground Water:** All free phase constituents of concern / product reasonably accessible will be removed; remaining constituents of concern /product must be managed. Final cleanup levels and goals for polluted ground water will be dependent upon all applicable water quality objectives and the risk of the polluted ground water to migrate to a potential receptor. These levels are expected to vary by Remediation Management Zone based upon proximity to the Bay, adjacent wetland areas, potential threat to the lower aquifer (Westside Basin), and protection of public health and the environment. In addition, a long term

airport wide monitoring program (surface, ground water, sediment) will be necessary to determine compliance with the non-attainment compliance monitoring points as well as when to implement contingency measures to assure that the compliance monitoring points are not violated. An airport wide monitoring network for both interior and along the airport boundary will be required. The monitoring program will focus on the preferential pathways including but not limited to utility and storm drain conduits.

- g. Subsequent Order(s) This order will be followed by subsequent Order(s) which will set final Remediation Management Zone boundaries and cleanup objectives for each RMZ after completion of initial tasks. It will also specify tasks and schedules for which additional work will be required. At this time it is expected that these technical report tasks will include proposals for airport wide monitoring, contingency plan(s), operation and maintenance plans, and institutional arrangements for ongoing operations, control, and notification. Board staff anticipate that this subsequent Order(s) will be brought before the Board in mid 1995.
- h. Discharger Compliance and Regional Board Enforcement If the Dischargers satisfactorily implement, maintain, and comply with a Regional Board approved site cleanup plan that incorporates the non-attainment area concept, the Regional Board, utilizing its discretionary authority, will not enforce the requirement to meet water quality objectives within the approved non-attainment areas. The Regional Board will enforce the requirement to meet all applicable soil cleanup levels and water quality objectives for ground water in the areas within the Airport that are not within the approved non-attainment areas.
5. **HYDROGEOLOGY** Many of the areas of concern within the airport are covered by asphalt which varies from one half to four feet in thickness. The asphalt is underlain by a fill material which varies in thickness (2 to 14 feet) and composition dependent upon the time of fill and areal location. The fill varies in composition from sand to a fine grained silt or clay and has a permeability which varies depending on the composition of fill material. Within the fill material, there are buried stream channels that consist of sands and gravels and manmade gravel channels due to various utility and storm drain lines. These channels, both as manmade and original stream bed deposits, are a major mechanism for ground water and pollutant transport. The fill material is underlain by bay mud which begins anywhere from 3.5 feet below ground surface (bgs) to 16 feet bgs dependent upon the thickness of the fill material. The bay mud ranges in thickness from approximately 3 to 30 feet. Based upon limited subsurface investigations performed to date it appears that the bay mud is contiguous across the site. However, further studies will be necessary to confirm the continuity of the bay mud layer.

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The first water bearing zone, known as the A-fill zone, occurs at approximately 3.5 to 16 feet bgs at the intersection of the fill material and bay mud interface. It varies in depth and thickness depending upon of the thickness and type of fill material in the upper zone and the depth of the original bay mud prior to fill activities.

The second zone, or A-sand zone occurs below the bay mud layer. It consists of poorly sorted sands containing some discontinuous layers of silts and clays. This zone begins generally around 15 to 20 feet bgs depending upon the thickness of the overlying fill and bay mud layers and extends to depths ranging from approximately 35 to 50 feet bgs. There appears to be a clay layer approximately 3 to 4 feet thick separating the A-sand zone from the underlying B-sand zone, but this is not conclusive due to very few sample locations. The B-sand zone begins approximately 40 to 50 feet bgs and extends to approximately 140 to 155 feet bgs where bedrock is encountered.

6. **SUBSURFACE INVESTIGATIONS** Many investigations have been performed to date at the airport under contract with the Airport Commission and by many of the tenants as well in order to identify polluted areas within the airport. The following table summarizes the areas that have been investigated, the plot number, the Discharger(s) for the site indicated, the source of the pollution, and the pollutants that have been detected either in the subsurface soils or ground water. [Note: as described in Finding 3, in addition to the named Discharger(s), the City and County of San Francisco is also considered as a Discharger since they own or have operated on the property at the time of the release. Also, the designation of Discharger may be modified dependent upon new information provided.] (See Figure 2 for site locations as indicated by their corresponding site number.)

SITE NO.	AREA NAME	PLOT NO.	DISCHARGER	POLLUTION SOURCE	POLLUTANT
I	Former Pan Am Facility	1	United Airlines, Ogden Allied Ground Services	USTs, Fuel Hydrant System, Operations, Spills	TPH-g, TPH-d, TPH-j, PNAs, BTEX, VOCs PCBs, Metals
II	Trans World Airlines Cargo/Freight	3	Trans World Airlines	USTs, Fuel Hydrant System	TPH-g, TPH-j, Oil & Grease, BTEX
III	National Car Rental Facility	Road 20	National Car Rental Systems, Inc.	USTs	TPH-g, BTEX
IV	Hertz Car Rental Facility	Road 20	The Hertz Corp.	USTs	TPH-g, BTEX

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SITE NO.	AREA NAME	PLOT NO.	DISCHARGER	POLLUTION SOURCE	POLLUTANT
V	Avis Car Rental Facility	Road 20	Avis Rent-A-Car System, Inc.	USTs	TPH-g, BTEX
VI	Chevron Station	Road 20	Chevron U.S.A. Inc.	USTs	TPH-g, BTEX, Oil & Grease
VII	United Air Lines Service Center	Plots 4,5,6	United Airlines	USTs, Fuel Hydrant System, Maintenance Operations	TPH-d, TPH-j, Motor Oil, VOCs, Semi-VOCs, Metals
VIII	South Terminal	Areas A & B	Trans World Airlines, Delta Airlines, Inc.	Fuel Hydrant System	TPH-j, TPH-d, Motor Oil
IX	North Terminal	Gate 75	United Airlines, Chevron U.S.A Inc., Shell Oil Company	USTs, Fuel Hydrant System	TPH-g, TPH-j, Oil & Grease
X	United Parking Area	Lot DD	Santa Fe Pacific Pipeline Partners	Fuel Hydrant System	TPH-j
XI	American Cargo Facility	Plot 9	American Airlines	USTs	TPH-g, Oil & Grease
XII	Eastern Airlines Facility	Plots 7,8, 10	City & County of San Francisco, Quantas Airways, Signature Flight Support, Chevron Corporation	USTs, Maintenance Operations, Fuel Hydrant System	TPH-g, TPH-d, TPH-j, Oil & Grease, BTEX, VOCs, Metals
XIII	American Super Bay Hanger	Plot 40	American Airlines	USTs	TPH-g
XIV	ASI Building/ FAA Hanger	Plots 41/42	City & County of San Francisco	Maintenance Operations	Metals, Chromium, TPH
XV	Former Treatment Plant	Plot 52	City & County of San Francisco	Treatment Plant Operations, Misc.	TPH-g, TPH-d, Oil & Grease, Metals

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SITE NO.	AREA NAME	PLOT NO.	DISCHARGER	POLLUTION SOURCE	POLLUTANT
XVI	United Airlines Maintenance Operations Center		United Airlines	USTs, Maintenance Operations	TPH-g, TPH-d, TPH-j, VOCs, Metals, Waste Oils, Stoddard solvents,
XVII	U.S. Coast Guard	Taxi-C	U.S. Coast Guard	Fuel Hydrant System	TPH-j
XVIII	Federal Express	Plot 50	City & County of San Francisco, Federal Express, Chevron U.S.A. Inc., Shell Oil Company, P.S. Group, Japan Airlines	USTs, Fuel Hydrant System, Former Laboratory	TPH-g, BTEX, TPH-j, VOCs, vinyl Chloride
XIX	Bulk Tank Farm Area	North Tank Farm	Chevron U.S.A. Inc., P.S. Group, Shell Oil Company	Bulk Storage Above Ground Tanks and Related Fuel Hydrant System Piping	TPH-j
XX	FAA Spill Area	Run way 28R	Federal Aviation Administration	2,000 gallon diesel spill	TPH-d
XXI	North Storm Water Retention Pond	North Pond	City & County of San Francisco	Industrial Waste Water, Spills, Misc.	TPH-g, TPH-d, TPH-j, PNAs ?, PCBs ?, BTEX, VOCs, Metals, Cyanide?, Oil
XXII	South Storm Water Holding & Oxidation Pond	South Pond	City & County of San Francisco	Industrial Waste Water, Spills, Misc.	TPH-g, TPH-d, TPH-j, PNAs ?, PCBs ?, BTEX, VOCs, Metals, Cyanide?, Oil
XXIII	Satellite II Facility	South Tank Farm	Unocal Corporation, Shell Oil Company	Industrial Waste Water, Spills, Misc.	

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- 7. GROUND WATER POLLUTION** The first ground water bearing zone has been polluted with various chemical constituents dependent upon the area. The pollutants detected are listed above in tabular form on a Plot by Plot basis. They include the following: petroleum hydrocarbons, benzene, toluene, xylene, ethyl-benzene, solvents, metals, PNAs, and PCBs. Free product has been documented in various locations and mainly consists of jet fuel from the fuel hydrant system and from leaking underground storage tanks.
- 8. FUEL HYDRANT SYSTEM** This system distributes aircraft fuel from the bulk storage above ground tank farm, located at the northern section of the airport, to the terminals where the airplanes are fueled, was found to contribute significant soil and ground water pollution throughout the entire airport. Many leaks have been discovered, the most notable at Boarding Areas A and B where in excess of 3,500 gallons of free product have been recovered due to a leak in one of the subsurface valves. Many of the fueling pits, and elbows have led to significant product loss due to the high pressure (approximately 160 to 180 psi) of the fuel within the lines.
- 9. INTERIM REMEDIAL ACTIONS** Various interim remedial measures have been performed to date including soil excavation and treatment and free product removal from ground water extraction systems at various site locations. An interim task for an expedited cleanup of the Ground Transportation Center area is included to accommodate the construction schedule of the Airport's Master Plan.
- 10. BASIN PLAN** The Regional Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on December 17, 1986, and has been subsequently amended. The Basin Plan was amended by the Regional Board on August 17, 1994, to include a Non-Attainment Area policy. Although essentially identical in concept to the Basin Plan amendments, this Order stands alone and does not depend upon the Basin Plan in the implementation of a Non-Attainment Area(s). The Basin Plan identifies beneficial uses and water quality objectives for the surface and ground waters in the region, as well as discharge prohibitions intended to protect beneficial uses.
- 11. DESIGNATION OF GROUND WATER BENEFICIAL USES** The present and potential beneficial uses for ground water beneath and adjacent to the airport including the Westside Basin are designated in Section II of the Basin Plan. The shallow ground water zone underlying the site is not currently being used. The present and potential beneficial uses of the ground water under and adjacent to the facility including the Westside Basin are:

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- a. Industrial process water supply
- b. Industrial service water supply
- c. Surface water discharge to the San Francisco Bay
- d. Municipal and Domestic Supply*

*This beneficial use may not be applicable to some of the *shallow* ground water underlying the airport based upon the initial data collected at Plot 1 due to high total dissolved solids. Further evaluation will be necessary to determine whether or not this beneficial use will apply airport wide.

The Remediation Management Zone 1 (The Zone closest to the Bay) shallow ground water, and possibly other Zones, existing and beneficial uses also include protection of surface water beneficial uses due to infiltration to the Bay and other surrounding surface waters.

The deeper aquifer underlying the shallow or fill zone is identified as the Westside Basin. This Basin is currently used as a drinking water supply. It is also currently being considered for additional municipal supply and is considered by several water agencies, including the City, to be a high priority basin for future municipal water supply development.

12. **DESIGNATION OF SURFACE WATER BENEFICIAL USES** The largest surface water body adjacent to the Site is the Lower San Francisco Bay. The existing and potential beneficial uses of Lower San Francisco Bay as identified within the Basin Plan include:

- a. Water Contact Recreation
- b. Non-Contact Water Recreation
- c. Preservation of Rare and Endangered Species
- d. Estuarine Habitat
- e. Wildlife habitat
- f. Fish spawning
- g. Saltwater Species Habitat
- h. Industrial Process Supply
- i. Navigation
- j. Ocean Commercial and Sport Fishing
- k. Fish Migration
- l. Shellfish Harvesting

In addition, the adjacent wetlands to the Airport provide similar existing and potential beneficial uses, primarily wildlife habitat as well as non-contact water recreation, and potentially preservation of rare and endangered species.

- 13. CONDITION OF POLLUTION OR NUISANCE** The Dischargers have caused or permitted, and threaten to cause or permit, waste to be discharged or deposited where it is or probably will be discharged to waters of the State and create or threaten to create a condition of pollution or nuisance.
- 14. COST REIMBURSEMENT** Pursuant to Section 13304 of the Water Code, the dischargers are hereby notified that the Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects of thereof, or other remedial action, required by this Order.
- 15. CEQA EXEMPTION** This action is an Order to enforce the laws and regulations administered by the Regional Board. This action is categorically exempt from the provisions of the CEQA pursuant to Section 15321 of Title 14 of the California Administrative Code, Enforcement Actions by Regulatory Agencies.
- 17. NOTIFICATION OF ORDER AND PUBLIC HEARING** The Regional Board has notified the Dischargers, responsible parties and interested agencies and persons of its intent under California Water Code Section 13304 to prescribe Site Cleanup Requirements for the discharge and provided them with the opportunity for a public hearing and an opportunity to submit their written views and recommendations.
- 18. PUBLIC MEETING** The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the Dischargers shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS

- 1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect the beneficial uses of the waters of the State is prohibited.**
- 2. Further significant migration of pollutants through subsurface transport to waters of the State is prohibited.**

3. Activities associated with subsurface investigation and cleanup which will cause significant adverse migration of pollutants are prohibited.

B. SPECIFICATIONS

1. Investigation, Remediation, and Monitoring Activities: The Dischargers shall conduct Site investigation, remediation and monitoring activities as needed to define the current hydrogeologic conditions, to define the lateral and vertical extent of soil pollution on-Site, to define the lateral and vertical extent of ground water pollution on or emanating from their individual sites, remediate as may be required any soil pollution on-site, and remediate as may be required any ground water pollution on or emanating from their site(s). Should monitoring results show evidence of pollutant migration, the source of which is the Site, additional characterization and remediation may be required.
2. Nuisance: The storage, handling, treatment or disposal of soil or ground water containing pollutants shall not create a nuisance as defined in Section 13050(m) of the California Water Code.
3. Remediation Management Zone Soil and Ground Water Cleanup Levels Final RMZ boundaries and cleanup levels will be set in subsequent orders based in part on technical reports required in the Provisions below.
4. Reclamation: If ground water extraction and treatment is considered as an alternative, the feasibility of water reuse, re-injection, and disposal to the sanitary sewer must be evaluated. Based on Regional Board Resolution 88-160, the Dischargers shall optimize, with a goal of 100%, the reclamation or reuse of ground water extracted as a result of cleanup activities. The Dischargers shall not be found in violation of this Order if documented factors beyond the Dischargers' control prevent the Dischargers from attaining this goal, provided the Dischargers have made a good faith effort to attain this goal. If reuse or re-injection is part of a proposed alternative, an application for Waste Discharge Requirements may be required. If discharge to waters of the State is part of a proposed alternative, an application for an NPDES permit must be completed and submitted, and must include the evaluation of the feasibility of the water reuse, re-injection, and disposal to the sanitary sewer.

C. PROVISIONS

1. The Dischargers shall comply with the Prohibitions and Specifications above, in accordance with the following time schedule and tasks.

TASK 1A: Submit a technical report acceptable to the Executive Officer that compiles and evaluates all geological data pertaining to the thickness and integrity of the Bay Mud for a given location of which each individual is named as a Discharger.

DUE DATE: FEBRUARY 15, 1995

Description: The technical report should include the boundaries of the study area for which the Discharger is named and a compilation of all geotechnical information available pertaining to the thickness, integrity, permeability, etc. Board staff recommend that Dischargers form task groups for common areas and submit the information together. The information should include a map showing locations of all borings and the detailed information or boring log data for that particular boring. Cross sections or isopachs should accompany these figures along with a complete evaluation of the data. Recommendations for locations where additional data is needed and a strategy for conducting a uniform approach for collection of data shall also be included.

TASK 1B: Submit a workplan and implementation schedule satisfactory to the Executive Officer to evaluate the risk to the Westside Basin across the entire airport area utilizing the bay mud as a barrier.

DUE DATE: MARCH 7, 1995

Description: Each Discharger or group of Dischargers shall submit a workplan for their individual area (as determined by Task 1A) to determine the risk to the underlying Westside Basin by utilizing the Bay Mud under the A-Fill Zone as a barrier. The risk should consider at least the thickness, integrity, and possible onsite activities that may alter the integrity (BART tunnel, pilings, etc) of the bay mud and may be categorized by Remediation Management Zones. Dischargers are strongly encouraged to utilize a joint approach, workplan and report. An implementation schedule including a date for the submittal of the study results must be included.

TASK 2: Submit a workplan satisfactory to the Executive Officer identifying discharger responsibility, location of leaks within the fuel hydrant system, a delineation of the extent of pollution for those areas, and a remediation plan with schedule either airport wide, by individual site, or by Remediation Management Zone.

DUE DATE: FEBRUARY 15, 1995

Description: The Technical Report (workplan) shall determine the current ownership/responsible parties of the fuel hydrant system for the entire airport. Based upon this determination, the responsible Discharger or group of Dischargers will be responsible for submitting a workplan to determine the integrity of the section of pipeline that they own and the extent of the pollution, if any, emanating from the leaking pipeline and hydrant system. The workplan should include investigation at hydrant pits, elbows, fittings, abandoned lines, and any other area that may be potential candidate for leaking (or determined to be leaking as a result of a line integrity test) hydrocarbons into the surrounding soils and ground water. The final product shall include a proposed cleanup plan with time schedule. A joint and/or master workplan airport wide or by Remediation Management Zone for all the responsible dischargers is strongly encouraged. An Implantation schedule including a date for the submittal of the study results must be included.

TASK 3: Submit a technical report satisfactory to the Executive Officer recommending appropriate and applicable cleanup objectives and an implementation schedule for all constituents for soil and ground water within each Remediation Management Zone.

DUE DATE: APRIL 15, 1995

Description: The Dischargers which have detected particular constituents of concern within their designated areas shall submit a technical report satisfactory to the Executive Officer which details an approach for setting cleanup objectives. This report should include and incorporate the results of both Task 1A and Task 1B (the evaluation of the integrity of the Bay Mud study). Recommendations of numerical cleanup objectives for both soil and ground water to protect water quality, human health, and the environment for both fuel the non-fuel constituents for each Remediation Management Zone shall be included. The approach should utilize risk based techniques for assessing exposure to water quality, human and ecological receptors. The implementation

schedule shall be coordinated with the Airport expansion plans such that polluted soil removal or remediation is completed at polluted sites before or during demolition and as a minimum prior to new building construction or occupancy. Dischargers are strongly encouraged to prepare and submit a joint technical report.

TASK 4: Submit a technical report for interim time frame prior to the adoption of the final RMZ cleanup objectives for the remediation of the Ground Transportation Center Area and New International Terminal Area.

DUE DATE: JUNE 1, 1995

(Submit proposed implementation schedule: March 16, 1995.)

Description: All Dischargers located within the Ground Transportation Center area and proposed International Terminal area shall submit individual or a combined workplan acceptable to the Executive Officer for the remediation/management of contaminated soils and groundwater. The plan should include an implementation schedule which corresponds to the Airport Master Plan, selection of remedial option, confirmation sampling and analyses plan, disposal plan for contaminated/treated soils, a groundwater treatment plan for both dewatering during excavation activities and long term, and a groundwater quarterly monitoring plan. Staff are aware that the final design specifications are forthcoming and therefore will allow for flexibility on the implementation of the remedial action plan.

- 2. The Dischargers shall submit to the Regional Board reports acceptable to the Executive Officer on the compliance with the requirements of this Order and activity monitoring reports that contain descriptions and results of work and analysis performed. These reports are to be submitted according to a program prescribed as outlined below.**
 - a. ON A QUARTERLY BASIS, the Dischargers shall submit status reports, which may be prepared in a business letter format, documenting compliance with this Order commencing on April 15, 1995. Thereafter, reports shall be due quarterly on the 15th of each ensuing July, October, January, and April. These reports may be submitted separately, but it is strongly encouraged that the reports be submitted in combination with other Dischargers**

and/other report due. Each quarterly report shall cover the previous calendar quarter and include at least the following information:

- (1) Summary of the work completed since submittal of the previous report, and work projected to be completed before the submittal of the next report.
- (2) Identification of any obstacles which may threaten compliance with the schedule set forth by this Order, and what actions are being taken to overcome these obstacles.

b. **ADDITIONALLY, ON A QUARTERLY BASIS**, technical reports documenting quarterly ground water monitoring shall be submitted by the Dischargers to the Regional Board commencing April 15, 1995, and covering the previous calendar quarter. In order to facilitate Airport wide consistency, water level measurements and samples of all monitoring wells shall be collected the first week of the month prior to the month of submittal. Each quarterly monitoring report shall include, but not be limited to, the following information:

- (1) Cumulative tabulated results of free product measurements for total petroleum hydrocarbons and water quality sampling analyses for all monitoring wells both on and related off-Site. This data shall be accompanied by pollutant isoconcentration plume maps for each chemical constituent of concern for the first water bearing formations based upon the results of the recent sampling event.
- (2) A cumulative tabulation of all well construction details including screen intervals, screen lengths, well installation dates, quarterly water level measurements, and cumulative chemical concentrations for each well.
- (3) Quarterly updated water table and piezometric surface maps, based upon the most recent water level measurements for all affected water bearing zones for all on-Site and related off-Site wells.
- (4) A cumulative tabulation of volume of extracted ground water, quarterly chemical analyses results for all extraction wells, and

a report indicating the pounds of pollutants removed during the quarter and total pounds of pollutants removed to date.

- (5) Reference diagrams and maps including the hydrogeologic conditions of the Site, and appropriately scaled and detailed base maps showing the location of all monitoring wells and extraction wells, and identifying facilities and structures.
- c. **ON AN ANNUAL BASIS**, technical reports on the progress of compliance with all requirements of this Order and any proposed modifications which could increase the effectiveness of final cleanup actions shall be submitted to the Regional Board by the Dischargers. The first annual compliance report is due January 15, 1996, and would cover the previous calendar years activities. Annual reports may include quarterly reports due concurrently. The annual progress reports shall include, but not necessarily be limited to, progress on site investigation and remediation activities, operation and implementation of interim and final remediation systems, effectiveness of remediation actions and systems, and an evaluation of the feasibility of meeting the ground water and soil cleanup goals established by this Order.

With appropriate justification and written request from the dischargers, the Executive Officer may amend the reporting requirements for content and frequency.

3. The dischargers may, by written request, seek modifications or revisions, or termination of this Order or any program, plan, or schedule submitted pursuant to this Order at any time. This Order and any applicable program, plan, or schedule may be modified, terminated, or revised by the Regional Board.
4. If the Dischargers are delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the Dischargers shall promptly notify the Executive Officer. If, for any reason, the Dischargers are unable to perform any activity or submit any document within the time required under this Order, the Dischargers may make a written request for a specified extension of time. The extension request shall include justification for the delay, and shall be submitted to the Regional Board in advance of the date on which the activity is to be performed or the document is due. The Regional Board staff may

propose an amendment to the Order and bring the matter to the Board for consideration.

5. All hydrogeological plans, specifications, technical reports and documents shall be signed by or stamped with the seal of a State registered geologist, registered civil engineer, or certified engineering geologist.
6. All samples shall be analyzed by a State certified laboratory or laboratory accepted by the Regional Board using approved EPA methods for the type of analysis to be performed. All laboratories or the consultant shall be required to maintain quality assurance/quality control records for Regional Board review.
7. The Dischargers shall maintain in good working order, and operate in the normal standard of care, any facility or control system installed to achieve compliance with the requirements of this Order.
8. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order shall be provided to the following agencies:

San Mateo County Health Department (Attn: Ms. Gail Lee)

9. The Dischargers shall permit, within the scope of each of their authorities, the Regional Board or its authorized representative, in accordance with Section 13267 (c) of the California Water Code:
 - a. Entry upon dischargers' premises in which any pollution sources exist, or are suspected to exist, or inspection of any required records, which are relevant to this Order.
 - b. Access to copy any records required to be kept under the terms or conditions of this Order.
 - c. Inspection of any monitoring equipment or methodology implemented in response to this Order.
 - d. Sampling of any ground water or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the Discharger.

**Order 95-018 / Site Cleanup Requirements
San Francisco International Airport et. al.**

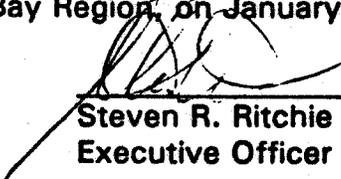
10. To the extent a Discharger has any ownership or present possessory interest in or to the Site, such Discharger shall file a report in a timely manner on any changes in Site occupancy and ownership associated with the facility/property described in this Order.
11. If in performing any work pursuant to this Order, any hazardous substance is discharged in or on any waters of the State, or discharged and deposited where it is, or probably will be discharged in or on any waters of the State, the Dischargers shall report such a discharge to this Board, at (510) 286-1255 on weekdays during office hours from 8:00 a.m. to 5:00 p.m., and the Office of Emergency Services at (800) 852-7550 during non-office hours. A written report shall be filed with the Board within five (5) working days and shall contain information relative to: the nature of the waste or pollutant, quantity involved, duration of incident, cause of spill, Spill Prevention, Control and Countermeasure Plan in effect, if any, estimated size of affected area, nature of effects, corrective measures that have been taken or planned, and a schedule of these activities, and persons notified.
12. This Order is intended to be the primary regulating document by which Site cleanup shall proceed for the Dischargers and properties identified herein with the Regional Board as lead agency. The Dischargers shall establish a primary contact representing the named Discharger(s) and submit the name of that representative to the Regional Board.
13. If the Executive Officer finds that the Discharger(s) have failed to comply with the Provisions of this Order, he is authorized to issue a complaint for Board consideration of Administrative Civil Liabilities, or after approval of the Board Chairperson, to request the Attorney General to take appropriate action against the Discharger(s), including injunctive and civil remedies, if appropriate.
14. The Dischargers shall be liable, pursuant to Section 13304 of the California Water Code, to the Board for all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial actions, required by this Order. All sites regulated under the Above-Ground Petroleum Storage Tank (AGT) program will continue to reimburse pursuant to the AGT program. If the other site(s) addressed by this Order are enrolled in a State Board-managed reimbursement program, reimbursement shall be made pursuant to this Order and according to procedures established in that program. Any

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disputes raised by discharger(s) over the reimbursement amounts or methods used in that program shall be consist with the dispute resolution procedures of that program.

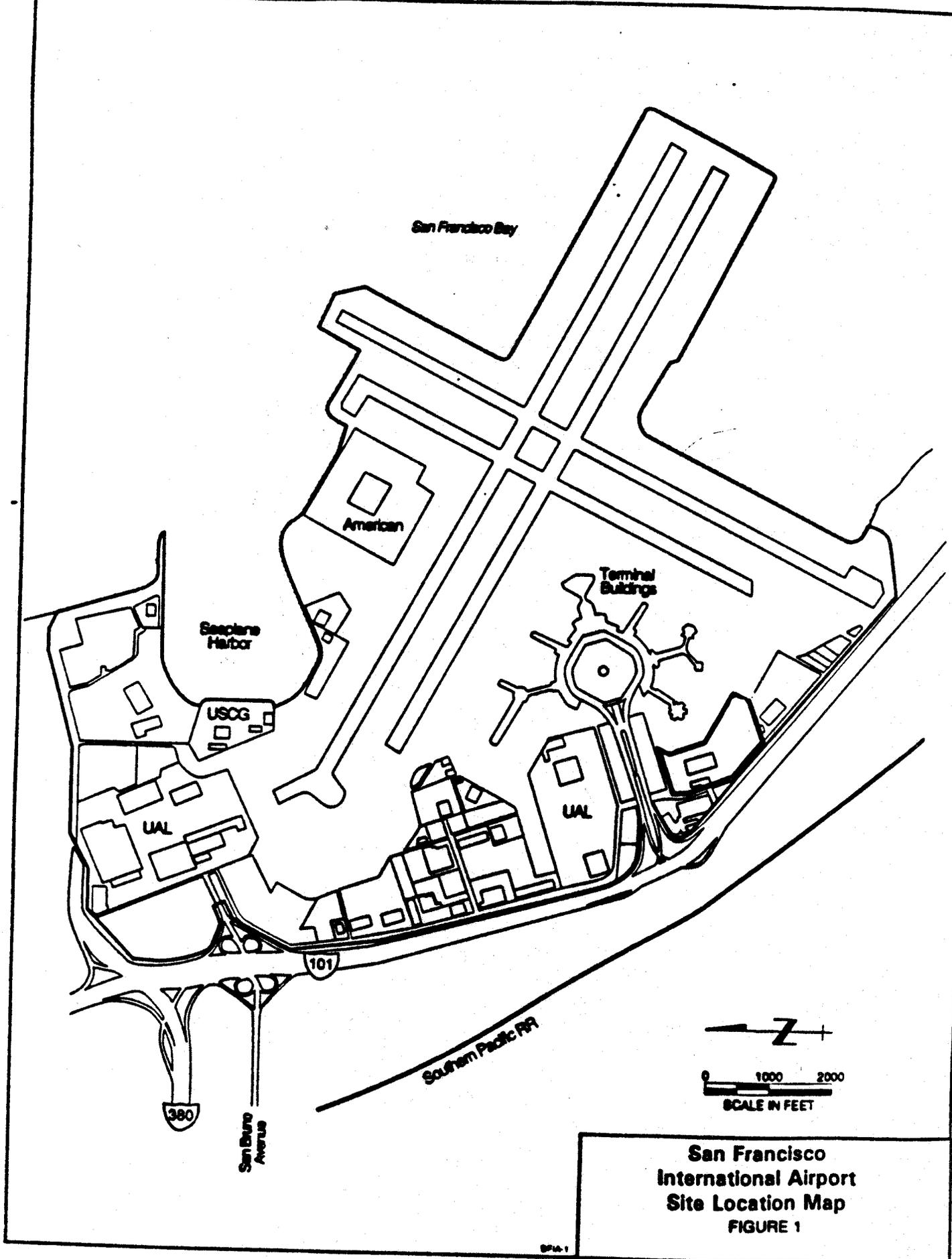
15. The Regional Board will review this Order periodically and may revise the requirements when necessary.

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on January 18, 1995.



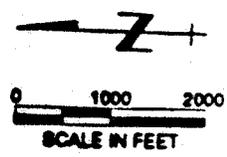
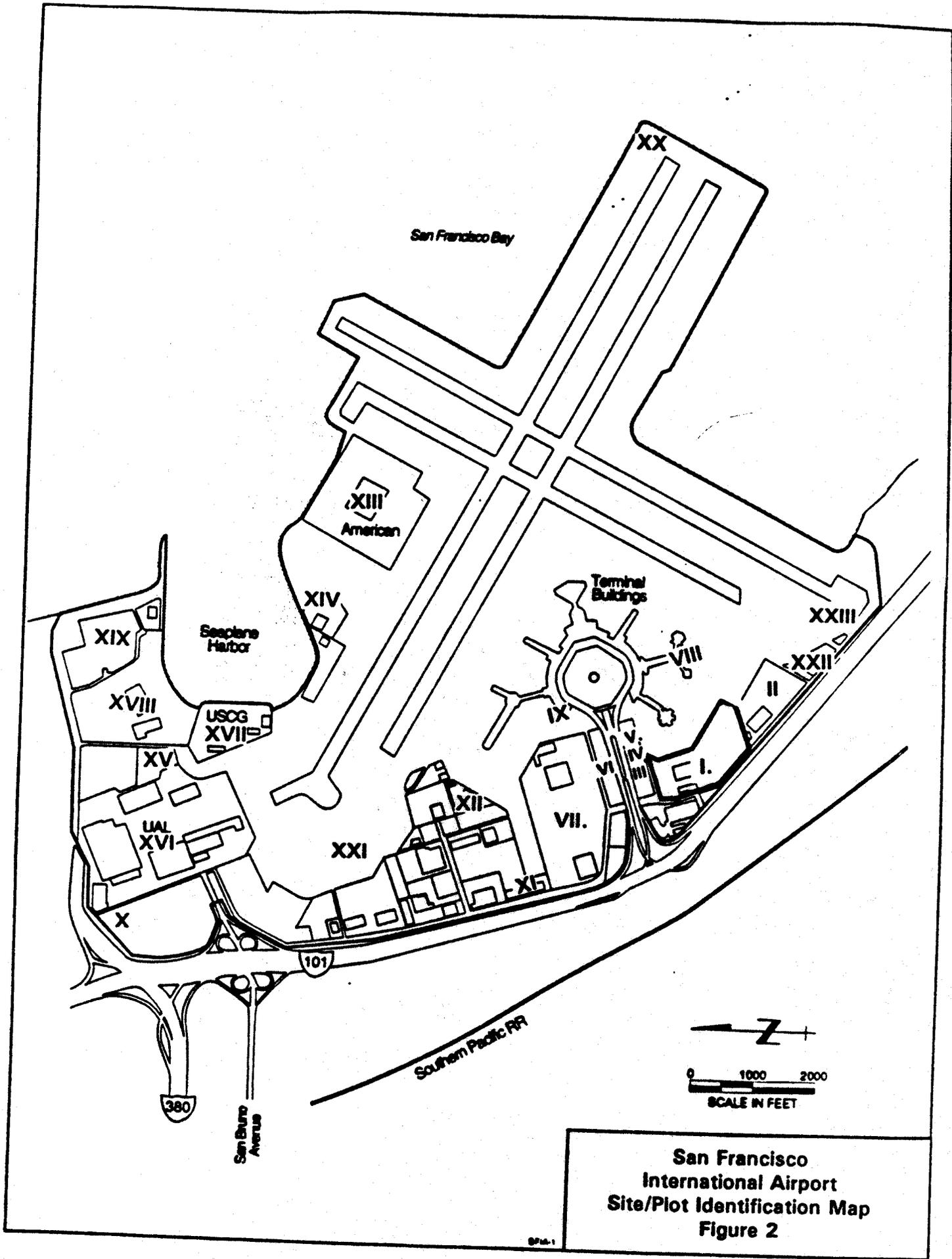
Steven R. Ritchie
Executive Officer

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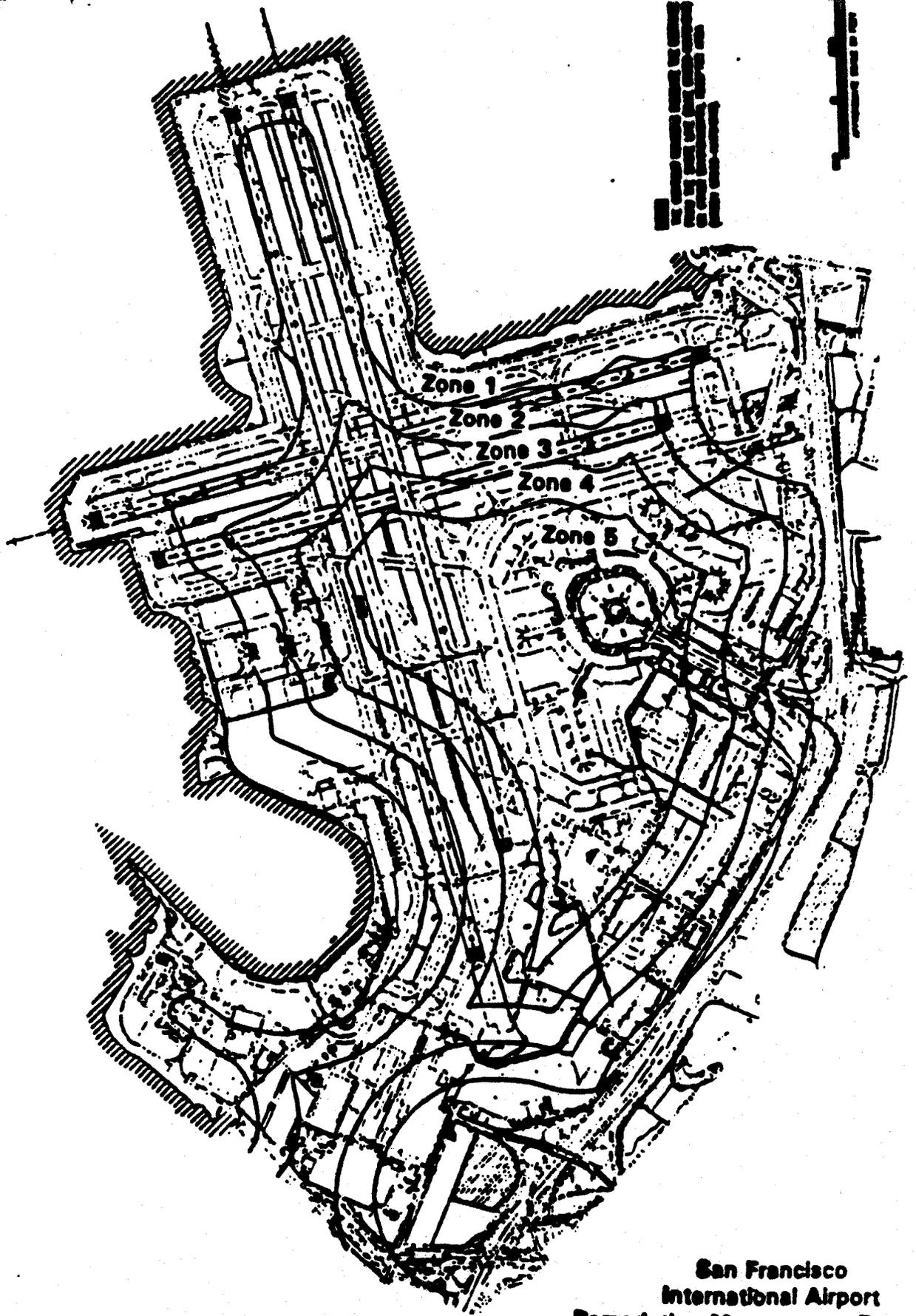


San Francisco International Airport Site Location Map
FIGURE 1

SP-1



San Francisco International Airport Site/Plot Identification Map Figure 2



San Francisco
International Airport
Remediation Management Zone Map
Figure 3