REPORT

Revised Risk Management Plan

Former Petroleum Terminals and Related Pipelines Located at Pier 64 and the Vicinity
City and County of San Francisco, California

August 2006

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1. Introduction

This Revised Risk Management Plan (RRMP) has been prepared by BBL Environmental Services, Inc. (BBLES) on behalf of Atlantic Richfield Company, Chevron Products Company, Texaco Inc., and Union Oil Company of California (the Pier 64 Group) for the former petroleum terminals and related pipelines, located at Pier 64 and the Vicinity in San Francisco, California (the Site). The Site is located in the southeastern portion of the Mission Bay area of San Francisco (Figure 1), and consists of six Operable Units (OUs). The combined OUs are bordered by the San Francisco Bay to the east, Illinois Street to the west, El Dorado Street to the north, and a strip of land extending 30 feet south of the southern border of Parcel X4 to the south (Figure 2).

1.1 Regulatory Framework

Historically, various bulk petroleum facilities were located along and in the vicinity of 16th Street in San Francisco. These bulk facilities were supplied with petroleum via pipelines, some of which were located under 16th Street. A marine terminal for the transfer of petroleum fuels to pipelines was located at the Port of San Francisco Pier 64 at the eastern terminus of 16th Street.

On June 15, 2005, the RWQCB adopted Final Site Cleanup Requirements (Order No. R2-2005-0028) for the former petroleum terminals and related pipelines, located at Pier 64 and the Vicinity in San Francisco, California. Order No. R2-2005-0028 (Order) superseded and rescinded previous Orders No. 98-028, 99-064, 01-137, and R2-2003-0018. Through the adoption of the Order in June 2005, the Pier 64 Site was redefined into six operable units identified as the 16th Street West OU, North Terminal OU, Parcel X4 OU, 16th Street East OU, Illinois Street OU, and OAS OU as shown on Figure 2. The Order also required the submittal of a Revised Mission Bay Area Risk Management Plan (RRMP) addressing the remedial action conducted, any residual contamination, recommended risk management measures, and an update of any past revisions.

1.2 Relationship to the Mission Bay Risk Management Plan

As part of the Mission Bay Development project, ENVIRON Corporation (Environ) performed an area wide risk assessment and developed a Mission Bay Area Risk Management Plan (RMP) that provides guidance and specific protocols for managing the chemicals in soil and groundwater in the Mission Bay area (Attachment 1). The RMP delineates the specific risk management measures that must be implemented prior to, during and after development of each parcel within the Mission bay area. This original RMP was submitted to the RWQCB and California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC) on May 11, 1999. On March 2, 2005, Clayton Group Services (Clayton) prepared a Site Mitigation Plan for Parcel X4 (X4 SMP), which was not originally included in the Mission Bay RMP area. The mitigation measures noted in the X4 SMP were substantially based on those in the RMP, so risk management procedures on Parcel X4 were generally consistent with the surrounding properties. The property owner requested the incorporation of Parcel X4 into the RMP area and this request was approved by the Board on May 31, 2005 (Attachment 2).

This RRMP was developed to address any changes to the original Mission Bay RMP resulting from the completed remedial work and any residual contamination at the Site. It also discusses the delegation of responsibility for long-term management of residual contamination.

Pursuant to the terms of the RMP, two relevant deed restrictions were recorded with the City and County of San Francisco's Assessor-Recorder. Catellus, the then owner of the North Terminal OU, and the City and County of San Francisco, each recorded a Covenant and Environmental Restriction on Property that, among other things, required property owners to comply with the terms of the Mission Bay RMP (Attachment 3).

The owner of the X-4 OU has submitted a draft Covenant and Environmental Restriction on Property relating to the X-4 OU to the Regional Board which requires, among other things, that the property owner comply with the terms of the Mission Bay RMP for that property.

1.3 Applicability

This RRMP was prepared to address chemicals present in the soil and groundwater beneath the Site. It sets forth the requirements to appropriately manage the chemicals in the soil within the Site. It is not intended to catalogue all other legal requirements that may apply to projects or other activities conducted. The borders of the six operable units (OUs) comprising the Pier 64 site are set forth in the Order. This RRMP is not intended to be applied for the management of risks elsewhere within the Mission Bay area.

1.4 Report Organization

This Revised Risk Management Plan is organized into the following sections:

- Section 2: Background
- Section 3: Revisions to Original Risk Management Plan
- Section 4: Long Term Responsibility for Operable Units
- Section 5: References

2. Background

2.1 Summary of Previous Investigations

On behalf of Catellus, Environ conducted an environmental assessment of the entire Mission Bay Redevelopment Project Area in 1997 (Environ, 1998). This investigation included collection of soil and groundwater samples for chemical analyses throughout the Mission Bay area, including the Site. Since then, numerous environmental investigations at the Site have been performed by interested parties to evaluate the distribution of constituents of concern in soil and groundwater, the presence of former petroleum pipelines, and feasible remedial alternatives.

Subsurface investigations revealed the existence of separate phase hydrocarbons (SPH) at the Site along the 16th Street pipeline corridor and under the majority of the footprint of the two former petroleum bulk storage facilities located in Parcel X4 OU and North Terminal OU, as well as their immediate surrounding and down gradient areas. SPH was observed predominantly as visual residual oil smeared into the soil matrix in a layer near the groundwater surface, presumably coincident with historical fluctuations of groundwater table, which is typically encountered at depths of 6 to 9 feet below ground surface (bgs) (SPH impacted soil smear zone). Across most of the Site, petroleum hydrocarbons were not visually evident in soil above historical groundwater tables. Elevated petroleum hydrocarbons were detected only sporadically in 15 isolated areas above historical groundwater tables. The lower vertical extent of SPH is present at the interface of fill material and native material, such as bedrock and bay mud. The majority of petroleum hydrocarbons that were present beneath the Site can be characterized as weathered total petroleum hydrocarbons (TPH) within the diesel (TPH-DRO) and motor oil (TPH-MO) ranges. SPH accumulation in the groundwater monitoring wells was evident in isolated areas. Petroleum hydrocarbons found in soil and groundwater posed potential threats to the San Francisco Bay due to the close proximity of the Bay to the Site.

Fill materials and native soil containing elevated levels of metals commonly underlie the Mission Bay. Elevated chromium and nickel concentrations at the Site appear to be correlated with native serpentine materials. Elevated lead concentrations at the Site were found within fill material containing brick, concrete, and other debris.

Additionally, methane was detected at various locations throughout the Site at concentrations as high as 16.9% by volume, likely derived from the decomposition of a combination of organic rich sediment and petroleum hydrocarbons.

2.2 Remedial Actions

2.2.1 Phase I

An initial remedial action was implemented from June through October 2001 within the OAS OU with the objective of creating a buffer zone to minimize potential impacts to the natural attenuation processes that currently protect the Bay. As discussed in *Remedial Investigation and Design Report for the Former Petroleum Terminals and Related Pipelines, Vicinity of Pier 64* (Clayton,), a zone of active sulfate reduction was identified between the San Francisco Bay and approximately 150 feet inland. Accessible SPH was removed from the soil and groundwater beneath the former rail yard to reduce the source of hydrocarbon solutes in the groundwater, effectively enhancing the natural attenuation zone, and minimizing the potential for mobile SPH to enter and

compromise the sulfate reduction zone. The 2001 Phase I remediation excavation area is outlined in Figure 3. Prior to excavation, monitoring wells located within the excavation footprint were abandoned. Excavation activities were conducted in two stages. The initial stage involved an interim cut to about 5 feet bgs. This clean overburden was processed to meet fill specifications and stockpiled for reuse as fill material as outlined in the original Mission Bay RMP Section 4.4.2 (v-vii). Following overburden removal, the excavation was extended to two feet below the groundwater surface (to approximately 9 feet bgs) and impacted soils were removed and disposed of offsite. A total of 14,020 tons of SPH impacted soil was removed. Soil containing residual oil below the target zone was left in place.

During overburden excavation, 57 pipelines were encountered in the former rail-yard area. Ten of the pipelines were determined to be utility lines and were left in place. Of the remaining pipelines, 25 were former petroleum pipelines, and 22 were not referenced on available historical site plans and lacked sufficient physical characteristics to determine their use. After removing any residual liquids contained in the non-utility pipelines, the pipelines were removed, cleaned, and transported to a steel recycling facility.

During the second stage of excavation, SPH accumulated on the exposed groundwater surface. Floating SPH was removed using a surface floating door skimmer and other pump devices. Once SPH had been removed, floating booms were used to isolate these areas from the active excavation area. Following completion of the final excavation and SPH removal, the excavation was dewatered by extracting groundwater from dewatering wells installed around the excavation perimeter. The extracted groundwater was treated through a series of particulate filters and carbon vessels prior to discharge to the San Francisco combined sewer system. Once the excavation was dewatered, the stockpiled overburden was used to backfill the excavation. Imported fill was placed in the upper 3-4 feet of the excavation, above the compacted overburden. All imported fill materials were submitted for geotechnical and chemical analyses and approved for use at the site. A hydroseed cover was applied following final grading activities.

An SPH collection trench approximately 3 feet in width and 9.5 feet deep was installed on the eastern side of the remedial excavation area to minimize potential SPH migration. High density polyethylene (HDPE) sheeting was placed from the base of the trench excavation to about four feet bgs. Collection sumps were constructed using 5-foot sections of 6-inch diameter continuous wire steel well screens placed across the water table. After the sumps were installed, the trench was backfilled with base rock below general rock. Until the commencement of Phase II activities, the collection sumps were monitored periodically for the presence of SPH. SPH were never observed in the collection sumps at thicknesses suitable for removal.

2.2.2 Phase II

Phase II of the remedial action consisted of the implementation of the *Remedial Action Plan, Other Areas of Site Operable Unit, Parcel X4 Operable Unit, Mission Bay, San Francisco* report (RAP) prepared by Clayton Group Services, Inc. (Clayton) and dated November 19, 2004. The specifics of the RAP are set forth in the *Project Specifications for Pier 64 Remediation Project – Phase II*, and the *Project Plans for Pier 64 Remediation Project – Phase II* (Project Plans and Specifications: Mark Thomas, 2005) prepared by Mark Thomas & Co., Inc., and dated February 16, 2005 and March 22, 2005 respectively, and *Project Plans for Pipeline Removal Under Terry A. Francois Boulevard* prepared by Blasland, Bouck and Lee, Inc. and dated December 15, 2005 (Project Plans and Specifications: BBL, 2005). Both the RAP and the Project Plans and Specifications reference provisions and standards set forth in the *Risk Management Plan – Mission Bay Area, San Francisco, California* (RMP; Environ, 1999). The tasks and activities that were implemented during the remedial action included:

- Demolition;
- Excavation and Management of Impacted Soils;

- Construction Dewatering and Separate Phase Hydrocarbon (SPH) Removal;
- Backfill and Compaction;
- Migration Control Measures;
- Petroleum Pipeline Removal; and
- Management of Residual Petroleum Hydrocarbons.

Demolition activities included the destruction of eighteen monitoring wells in accordance with the San Francisco Department of Public Health requirements, the demolition of existing structures and surface improvements on Parcel X4 OU, 16th Street East OU, and within the North Terminal OU, and the removal of aboveground and underground utilities within the Remedial Excavation Area footprint. Demolition activities were completed in May 2005. In accordance with the Project Specifications, the SPH Collection Gallery located on the western side of the Remedial Excavation Area that was installed as part of the 2001 Phase I Remedial Excavation was removed prior to the implementation of the Phase II Remedial Soil Excavation activities in June 2005.

Following Demolition, three stages of excavation were conducted:

- Stage I: Fifteen 20-foot diameter target areas that were identified by the Pier 64 Group and the property owners were excavated to elevation 95.5 feet Mission Bay Datum (MBD) and disposed offsite as a non-RCRA hazardous waste (Stage I). The excavation of these targeted areas was completed in June 2005. Two of the fifteen target areas within Parcel X4 OU had observed SPH-impacted soils at an elevation higher than 95.5 feet MBD. The deeper soil impacts from these cylinders were removed during Stage III activities, described below.
- Stage II: Based on the observed volume of accumulated SPH in groundwater monitoring wells, three locations were identified within the areas of excavation as Stage II soils to be removed prior to excavation dewatering. Clean overburden, per RMP Section 4.4.2 (v-vii) was removed, processed to meet fill specifications, and stockpiled onsite for future reuse as fill material. SPH impacted soils were excavated to 2-feet below groundwater table within the three Stage II regions and disposed offsite as a non-RCRA hazardous waste. The Stage II excavation was completed in July 2005.
- Stage III: All other soils that failed the reuse criteria as defined in the RMP, Section 4.4.2 (v-vii), were excavated and disposed offsite as a non-RCRA hazardous waste (Stage III). Stage III excavation was completed on January 13, 2006. In addition, SPH-impacted soils were discovered to extend beyond the anticipated limits of Phase II excavation as described in the RAP and Project Specifications and into the area of the adjacent parking lot beyond the north-northeast portion of the North Terminal OU. These limited areas with SPH impacts were successfully removed, disposed offsite as non-RCRA hazardous waste, and substantially backfilled per the requirements of the RAP and Project Specifications by January 20, 2006. The bottom of Stage III excavation is shown in Figure 4.

Sixty-eight dewatering wells and numerous sumps were installed around and within the excavation area to provide a dry working area for SPH soil excavation and backfilling. An onsite groundwater treatment system was installed to treat extracted groundwater in accordance with the San Francisco Public Utility Commission discharge requirements. SPH that accumulated on the groundwater surface following Stage II excavation and throughout the Stage III excavation was removed by skimming, pumping, placing of absorbent pads and use of a vacuum truck. Dewatering and water-treatment activities were implemented in August 2005 and ran until January 2006, when the dewatering well system was removed. Approximately 48,172,000 gallons of treated groundwater was discharged to the SFPUC system.

Following SPH impacted soil removal, the excavation area was backfilled with processed demolition materials (concrete crushed in accordance with the geotechnical specifications), processed overburden soils (in accordance with the RMP), and approved imported fill or virgin quarry fill. Stabilization fabric was placed directly on top of the excavation bottom, and covered with crushed concrete. Filter fabric was then placed between the crushed concrete layer and stockpiled overburden, and imported fill was used to bring excavations to final grade. Soil analytical data documenting the quality of the imported fill material was provided to, and approved by, the RWQCB, the San Francisco Department of Public Health and property owner before use. Substantial completion of backfill and compaction was completed by January 20, 2006 and additional backfilling and compaction to the final grade on the North Terminal OU will be completed by the property owner.

To minimize recontamination of the Phase II Remedial Excavation Area, a SPH migration barrier trench was installed on the western property line of the Parcel X4 OU. The barrier trench was constructed by placing a geo-membrane across the existing groundwater surface and backfilling with angular gravel. To minimize the potential for creating preferential pathways, clay trench plugs were installed at a minimum of every 300 feet. The installation of migration control measures was completed on November 18, 2005.

Residual liquids contained in the former petroleum pipelines were drained and disposed of in accordance with the RAP and Project Specifications. Steel pipelines were cleaned and disposed at a steel recycling facility. Soil removed a minimum of 2 feet from either side and beneath the former pipelines was stockpiled within the interim cut and disposed of along with SPH containing soils. Soils excavated above the former pipelines that were in compliance with the Mission Bay RMP re-use criteria were separated for re-use. The removal of petroleum pipelines in the Parcel X4, 16th Street East and North Terminal OUs was completed in December 2005. Removal of a previously unidentified 10 inch petroleum pipeline discovered underneath the adjacent parking lot was completed on January 25, 2006. Fifty-six former petroleum pipelines were removed underneath Terry A. Francois Boulevard in the near-shore portion of OAS; this removal was completed on March 7, 2006.

2.3 Residual Contamination

Detailed description of the excavation work is included in the *Pier 64 Phase II Completion Report* (BBLES, 2006). Summaries of the work completed within each OU are described below.

2.3.1 North Terminal Operable Unit

The North Terminal OU was excavated in accordance with the RAP prepared by Clayton and the Project Plans and Specifications prepared by Mark Thomas. Soil that did not meet reuse criteria as specified in RMP Section 4.4.2 (v-vii) of the Mission Bay RMP was excavated and disposed of as a non-RCRA hazardous material at a Class I - non RCRA landfill facility. Following excavation of impacted soils, inspection of the bottom of excavation was conducted across the grid. Confirmation tests and observations were photo-logged and documented on SPH removal grid verification packages. SPH that accumulated on the surface of exposed groundwater during excavation was skimmed and removed. As a result of these measures, the presence of residual contamination in the North Terminal OU is highly unlikely.

2.3.2 Parcel X4 Operable Unit

The Parcel X4 OU was excavated in accordance with the RAP, prepared by Clayton and the Project Plans and Specifications prepared by Mark Thomas. Soil that did not meet reuse criteria as specified in RMP Section 4.4.2 (v-vii) was excavated and disposed of as a non-RCRA hazardous material at a Class I - non RCRA landfill

facility. Following excavation of impacted soils, inspection of the bottom of excavation was conducted across the grid. Confirmation tests and observations were photo-logged and documented on SPH removal grid completion forms. SPH that accumulated on the surface of exposed groundwater during excavation was skimmed and removed. To prevent potential upgradient SPH from migrating onsite, an impermeable trench was constructed along the western boundary of the OU. As a result of these measures, the presence of residual contamination in the Parcel X4 OU is highly unlikely.

2.3.3 16th Street East Operable Unit

The 16th Street East OU was excavated in accordance with the RAP, prepared by Clayton and the Project Plans and Specifications prepared by Mark Thomas. Soil that did not meet reuse criteria as specified in Sections 4.4.2 (v-vii) in the Mission Bay RMP was excavated and disposed of as a non-RCRA hazardous material at a Class I - non RCRA landfill facility. Following excavation of impacted soils, inspection of the bottom of excavation was conducted across the grid. Confirmation tests and observations were photo-logged and documented on SPH removal grid completion verification packages. SPH that accumulated on the surface of exposed groundwater during excavation was skimmed and removed. As a result of these measures, the presence of residual contamination in the 16th Street East OU is highly unlikely.

2.3.4 16th Street West Operable Unit

Pursuant to the Order, petroleum pipeline removal must be completed no later than November 15, 2006. The 16th Street West OU consists of approximately 2,100 lineal feet of 16th Street beginning at the eastern boundary of Illinois Street and extending to a point 120 feet west of 7th Street as well as portions of Third Street extending 100 feet north and south of 16th Street. A number of petroleum pipelines have been identified within the 16th Street West OU, generally at depths of four to six feet bgs. Pipelines will be removed in accordance with the 16th Street West OU FS/RAP prepared by Clayton and dated October 13, 2005. Pipelines accessible by excavation will be removed, cleaned, and transported to a steel recycling facility. Non-accessible pipelines will be cut, drained of any residuals, and sealed with cement, bentonite, and/or mechanical plugs. Residual SPH contamination may be present in soil and groundwater after the pipeline removal is complete.

2.3.5 Illinois Street Operable Unit

The Order states that outside of the Remedial Excavation Area (i.e., under the 16th Street West OU, the Illinois Street OU, and in isolated areas within the OAS OU, under Terry A. Francois Boulevard, etc.), all applicable risk management measures in the RMP must be complied with. While petroleum contamination beneath Illinois Street may be present, all contamination in the Illinois Street OU is contained below the street. Thus, there is minimal risk for exposure to native soils prior to development.

2.3.6 Other Areas of the Site Operable Unit

Remedial activities occurred in the Other Areas of the Site OU during both the 2001 Phase I remediation and the near-shore pipeline removal conducted during Phase II. During Phase I, SPH impacted soil was excavated to two feet groundwater surface (to approximately 9 feet bgs) in the area of the former rail-yard. During the pipeline removal, soil extending approximately two feet below the high tide groundwater surface was excavated and disposed of offsite. Beyond these limits of excavation, both laterally and vertically, residual SPH contamination may be present.

3. Revisions to Original Risk Management Plan

3.1 Previous Amendments to the RMP

Parcel X4 was recommended for incorporation into the Mission Bay Area by ECOR-SF Holdings, Inc., the former owner of Parcel X4, in a proposal dated March 25, 2005. The California RWQCB approved this amendment on May 31, 2005, with no changes made to the risk management measures contained within the RMP (Attachment 2).

On June 23, 2005, the RWCQB approved a second amendment regarding the language in Section 4.3.5.3 of the original RMP as requested by the California Department of Toxic Substances Control (DTSC). Specifically, the original section stated that soil excavated from within the RMP Area could be moved around, managed and reused within the RMP area without triggering hazardous waste regulatory requirements if the reuse complied with the soil management procedures of the RMP. However, it did not expressly address any requirements pertaining to the movement of hazardous waste soil along public streets within the RMP Area. The amended section clarified the DTSC requirements for transportation of soil along public streets within the RMP without otherwise restricting the right to reuse soil within the RMP area (Attachment 2).

3.2 Risk Management Measures within the Pier 64 Remediation Area

Because much of the uncontaminated native soil from within the Mission Bay RMP area was reused as per section 4.3.5.3 of the original Mission Bay RMP, many of the original risk management measures are still adequate and relevant for the Pier 64 OUs. Some risk management measures are no longer applicable in certain OUs due to remedial construction and removal of contamination. The original Mission Bay RMP is included in Attachment 1. Table 1 references the appropriate risk management measures from the original Mission Bay RMP which apply to each operable unit.

Over the past several years, the members of the Pier 64 Group have entered into legal agreements with affected property owners to address long term responsibility for the management of residual contamination within the OUs. The RRMP summarizes key points in these agreements; however, it is important to recognize that this only a summary, and is not intended to affect or in any way modify the legal obligations set forth in the agreements among the various parties.

4. Long Term Responsibility For Operable Units

4.1 Responsibilities

Based on agreements between the property owners and the Pier 64 Group, the responsibilities for investigation, monitoring and environmental response activities with respect to petroleum hydrocarbons are summarized in Table 2.

4.2 Protocols for Coordination

The following describe the protocols for coordination with the property owners of each OU.

North Terminal OU

Texaco Inc. will coordinate access agreements for groundwater monitoring well installation, monitoring, and decommissioning. Texaco will coordinate installation of monitoring wells per the Revised Groundwater Monitoring Program approved by RWQCB on July 26, 2006.

Parcel X4 OU

Union Oil Company of California (Unocal) will coordinate access agreements for groundwater monitoring well installation, monitoring, and decommissioning. Unocal will coordinate installation of monitoring wells per the Revised Groundwater Monitoring Program approved by RWQCB on July 26, 2006. While the migration barrier is the responsibility of the property owner, any modifications to the migration barrier must be approved by the Pier 64 group, the property owner and the RWQCB.

16th Street East OU, OAS OU, Illinois Street OU, 16th Street West OU

The City or its contractor will manage petroleum impacted soil and/or groundwater within excavations in accordance with Mission Bay RMP with prior authorization of Pier 64 Group's Joint Consultant; however, emergency work may proceed without prior authorization. The Pier 64 Group will coordinate installation of monitoring wells per the Revised Groundwater Monitoring Program currently approved by RWQCB on July 26, 2006.

4.3 Deadlines for Response Actions to Mitigate Construction Delays

If required by the various agreements among the parties, applicable members of the Pier 64 Group will continue to work with each property owner to coordinate environmental response actions to meet the property owner's construction schedules.

4.4 Responsibility for Long-Term Management of Residual Pollution

Table 2 includes sections of the agreements between the property owners and the Pier 64 Group which address the responsibility for long-term management of residual pollution.

5. References

Blasland, Bouck & Lee, Inc. (BBL). 2005. *Project Plans for Pipeline Removal Under Terry A. Francois Boulevard*. December 15.

California Regional Water Quality Control Board San Francisco Bay Region (RWQCB). 2005. *Approval of Proposed Amendment to Mission Bay Risk Management Plan to Include Parcel X4, City and County of San Francisco, California.* May 31.

California Regional Water Quality Control Board San Francisco Bay Region (RWQCB). 2005. *Order #R2-2005-0028: Adoption of Final Site Cleanup Requirements and Rescission of Orders Nos. 98-028, 99-064, and R2-2003-0018 for Atlantic Richfield Company, Chevron U.S.A. Inc., Phillips Petroleum Company, Texaco, Inc., Union Oil Company of California, City and County of San Francisco, and ECOR-SF Holdings, Inc. for the former petroleum terminals and related pipelines located at Pier 64 and the Vicinity, City and County of San Francisco, California.* June 15.

California Regional Water Quality Control Board San Francisco Bay Region (RWQCB). 2005. *Approval of Amendment to Mission Bay Risk Management Plan to Clarify DTSC Requirements regarding Certain Movement of Hazardous Waste Soil along Public Streets within the RMP Area, Mission Bay Redevelopment Project Area, City and County of San Francisco, California.* June 23.

Clayton Group Services (Clayton). 2001. *Remedial Investigation Report and Design Report for the Former Petroleum Terminals and Related Pipelines, Vicinity of Pier 64, Port of San Francisco, San Francisco, California.* June.

Clayton Group Services (Clayton). 2004. *Remedial Action Plan, Other Areas of Site Operable Unit, Parcel X4 Operable Unit, Mission Bay San Francisco California.* November.

Clayton Group Services (Clayton). 2005. *Site Mitigation Plan, Mission Bay Parcel X4, 499 Illinois Street, San Francisco, California.* March

ENVIRON Corporation (Environ). 1999. *Risk Management Plan Mission Bay Area, San Francisco, California.* May.

Mark Thomas & Company, Inc. (Mark Thomas). 2005. *Project Specifications for Pier 64 Remediation Project Phase II.* Prepared for Clayton Group Services. February 16.

Mark Thomas & Company, Inc. (Mark Thomas). 2005b. *Project Plans for Pier 64 Remediation Project Phase II.* Prepared for Clayton Group Services. March 22.

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Tables

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Table 1
Applicable Sections of Original Mission Bay RMP
Revised Risk Management Plan
Pier 64
San Francisco, CA

Operable Unit	Applicable Sections of Original Mission Bay RMP					
	1	**2**	**3**	**4**	**5**	**6**
	Introduction	**Principal Environmental Findings**	**Risk Management Measures Prior to Development**	**Risk Management Measures During Development**	**Risk Management Measures After Development is Complete**	**Regulatory Oversight and Enforcement of RMP**
North Terminal	All	All	None[1]	All except section 4.4 [3]	All	All
Parcel X4	All	All	None[1]	All except section 4.4 [3]	All	All
Other Areas of the Site	All	All	None[1]	All	All	All
16th Street East	All	All	None[1]	All except section 4.4 [3]	All	All
16th Street West	All	All	Interim Risk Management Measures (v) and (vi)[2]	All	All	All
Illinois Street	All	All	Interim Risk Management Measures (v) and (vi)[2]	All	All	All

Table 1
Applicable Sections of Original Mission Bay RMP
Revised Risk Management Plan
Pier 64
San Francisco, CA

Notes:

1. Because North Terminal, Parcel X4, OAS and 16th Street East OUs are currently under development, interim risk management measures (IRMMs) designed for undeveloped parcels are not relevant to the protection of human health on those OUs. If development ceases or areas are created with uncovered native soils, IRMMs may again be necessary.

2. Because the 16th Street West and Illinois Street OUs do not contain any exposed native soils, the only necessary IRMMs are (v), Conduct All Subsurface Work in Compliance with the Worker Health and Safety Guidelines, and (vi), Conduct Periodic Monitoring.

3. Because all free product in the North Terminal, Parcel X4, and 16th Street OUs was removed by excavation or skimming SPH from the exposed groundwater surface, Section 4.4, Additional Management Measures Applicable to Development in the Free Product Area, is no longer applicable.

Table 2
Summary of Agreements Among the Parties
Revised Risk Management Plan
Pier 64
San Francisco, CA

Area	Agreement Sections Pertaining to Responsibility for Long-term Management of Residual Pollution[1]
North Terminal Operable Unit	Property Owner assumes responsibility for all non-groundwater future RMP requirements, including, without limitation, vapor issues (including the cost of vapor barriers), additional soil removal and/or dewater during future development, and any other applicable RMP requirements. Property Owner also responsible for all future investigation, monitoring, and (if required) environmental response activities related to petroleum hydrocarbons (including any petroleum or petroleum product, or any fraction or component thereof (including, without limitation, benzene, toluene, xylene, ethylbenzene, and MTBE)) related to the operations of the Pier 64 Group on the Property in soil on and below the OU, as may be required by the Regional Board or any other governmental agency. Texaco retains responsibility for and shall conduct all investigation, monitoring and environmental response activities at the Property relating to groundwater pursuant to the Order or any other order, directive, notice, ruling, pronouncement, or decree issued by the Regional Board or any other Governmental Authority with respect to (i)petroleum hydrocarbons (including any petroleum or petroleum product, or any fraction or component thereof (including, without limitation, benzene, toluene, xylene, ethylbenzene, and MTBE)) related to the operations of the Pier 64 Group on the Property, and (ii) any other compounds or substances related to the operations of the Pier 64 Group on the Property that are in the groundwater on or under or emanating from or migrating onto the Property.
Parcel X4 Operable Unit	Property owner assumes responsibility for implementation of Site Risk Management Plan for Parcel X-4 specifically including, but not limited to any petroleum hydrocarbon vapor mitigation measures (e.g., designing, constructing and/or maintaining a vapor barrier, if needed, beneath future development(s) constructed on Parcel X-4). Property owner is also responsible for implementing and complying with soil and/or groundwater investigation, assessment, remediation or monitoring, to the extent that it is required by the RWQCB or another regulatory agency as a result of any breach or failure by the property owner of the obligations to effectively implement and/or comply with the requirements of the Mission Bay RMP.

[1] This chart is a summary of several lengthy agreements, and is not intended to affect or in any way modify the legal obligations set forth in the agreements among the various parties.

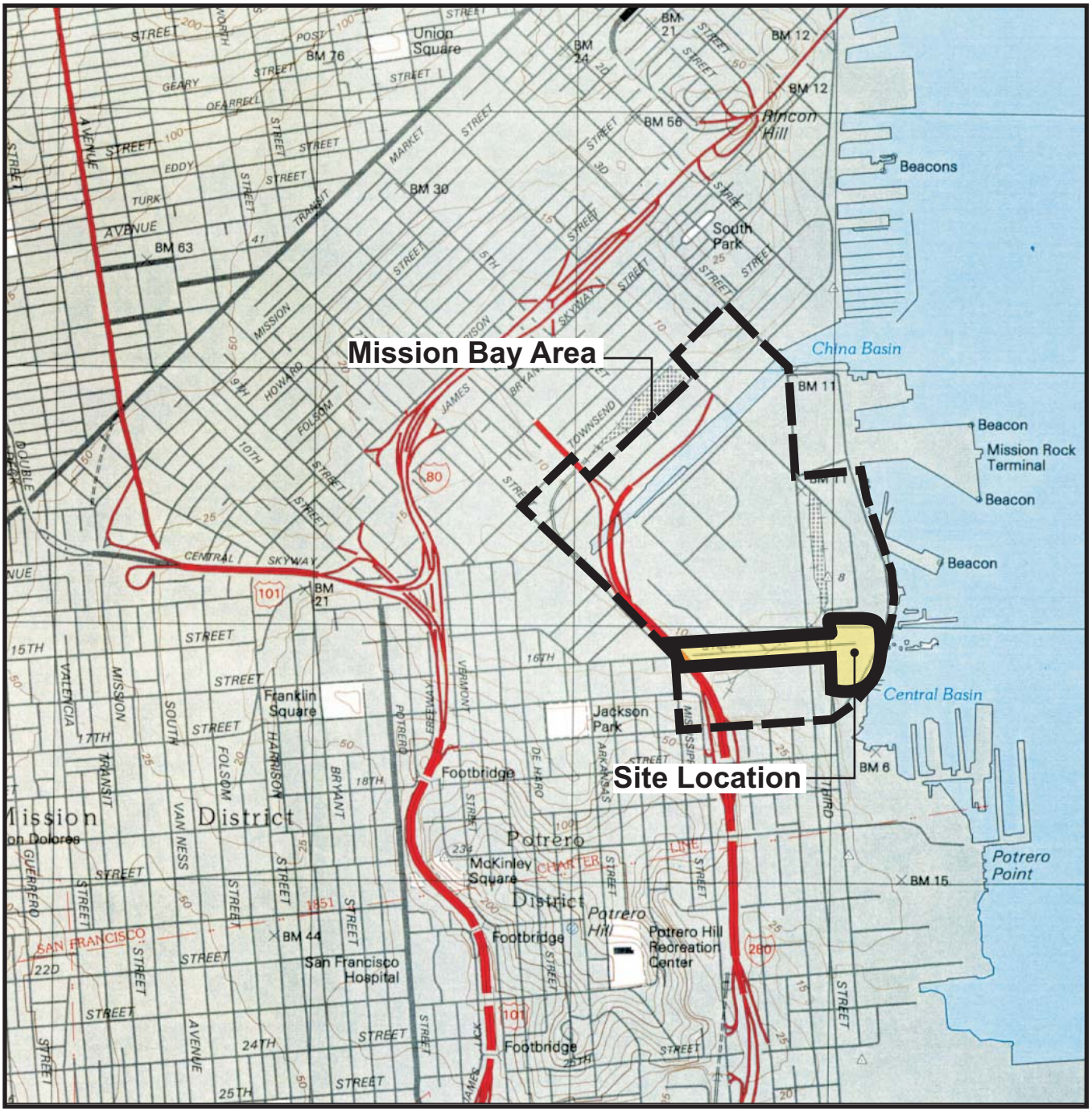
Table 2
Summary of Agreements Among the Parties
Revised Risk Management Plan
Pier 64
San Francisco, CA

Area	Agreement Sections Pertaining to Responsibility for Long-term Management of Residual Pollution[1]
Other Areas of the Site Operable Unit 16th Street East Operable Unit 16th Street West Operable Unit Illinois Street Operable Unit	City or its contractor will implement the Mission Bay RMP management actions that pertain to the Residual Petroleum Hydrocarbons on City Property in the City owned Regional Board Operable Units (RB OUs) as follows: a. Requirement for special notice to Board when working in the "free Produce Area" (as defined in the Mission Bay RMP, p. 4-42). Mission Bay RMP Section 4.4.2 (i). b. Additional worker safety training and protective equipment required because of the Residual Petroleum Hydrocarbons. For example, contractors may require HAZWOPER training and additional worker protective gear because of the potential for exposure to vapors from working in an area containing the Residual Petroleum Hydrocarbons. Mission Bay RMP Section 4.3.8. c. Handling of soil excavated in the Free Product Area, and the reuse of said soil. Mission Bay RMP Sections 4.4.2(v), (vi) and (vii). d. Air monitoring required because of the Residual Petroleum Hydrocarbons. Mission Bay RMP Section 4.4.2 (ii). e. Special utility design or engineering controls required because of the Residual Petroleum Hydrocarbons. Mission Bay RMP section 4.4.2 (iv). f. Use of back fill that would not have been required if the soil had not contained Residual Petroleum Hydrocarbons and otherwise could have been reused in accordance with the Mission Bay RMP. Mission Bay RMP Section 4.4.2 (v), (vi), (viii). g. Storage, treatment and disposal of the Residual Petroleum Hydrocarbons in groundwater. Mission Bay RMP Section 4.3.7.

[1] This chart is a summary of several lengthy agreements, and is not intended to affect or in any way modify the legal obligations set forth in the agreements among the various parties.

Figures

BBL®
ENVIRONMENTAL SERVICES, INC.
an ARCADIS company



REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., SAN FRANSICO NORTH, CA, 1993.

NOTE: BASE MAP BY CLAYTON GROUP SERVICES, 6920 KOLL CENTER PARKWAY SUITE 216, PLEASANTON, CA 94566, FIGURE 1 - SITE LOCATION MAP FROM THE NOVEMBER 2004 "REMEDIAL ACTION PLAN, OTHER SITE OPERABLE UNIT, PARCEL X4 OPERABLE UNIT, MISSION BAY, SAN FRANCISCO, CA" @ A SCALE OF 1" = 2,000'.

2000' 0 2000'

Approximate Scale: 1" = 2000'

Area Location

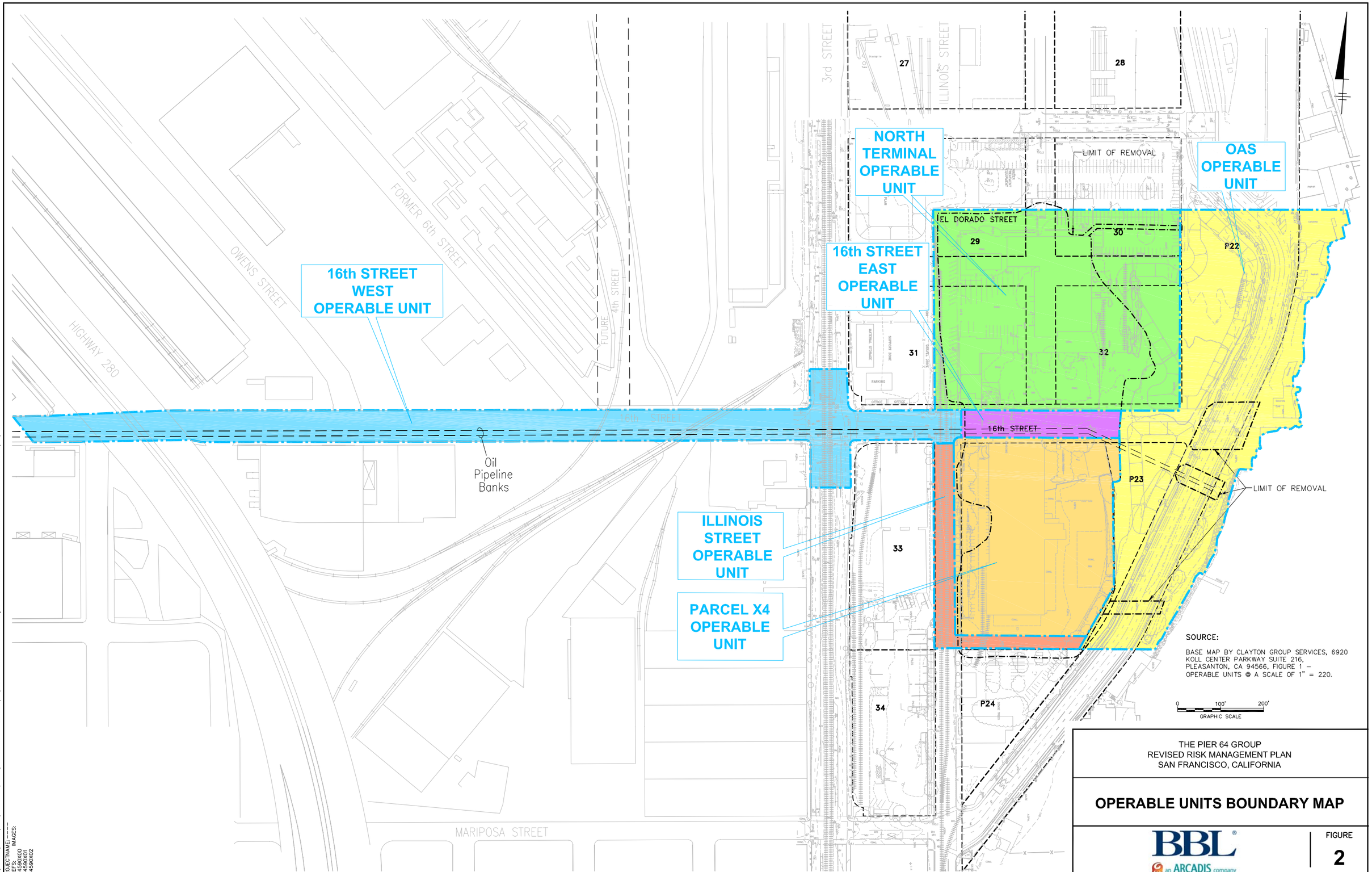
PIER 64 GROUP
REVISED RISK MANAGEMENT PLAN
SAN FRANCISCO, CALIFORNIA

GENERAL LOCATION MAP

BBL ENVIRONMENTAL SERVICES, INC. an ARCADIS company

FIGURE 1

05/06/05 SYR-D85-DJH
44383001/44383n01.cdr



THE PIER 64 GROUP
REVISED RISK MANAGEMENT PLAN
SAN FRANCISCO, CALIFORNIA

OPERABLE UNITS BOUNDARY MAP

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FIGURE
2

SYR-GHS KMD LJP LAYER: ON=*; OFF=*REF*
F:\ACTIVE\-DWG\ACT\44590009\RMP\44590B01.DWG SAVED:8/16/2006 11:19 AM LAYOUT:Layout1 PAGESETUP:---- PENTABLE:PLTFULL.CTB PRINTED:8/17/2006 2:03 PM BY:TRITSCHEL
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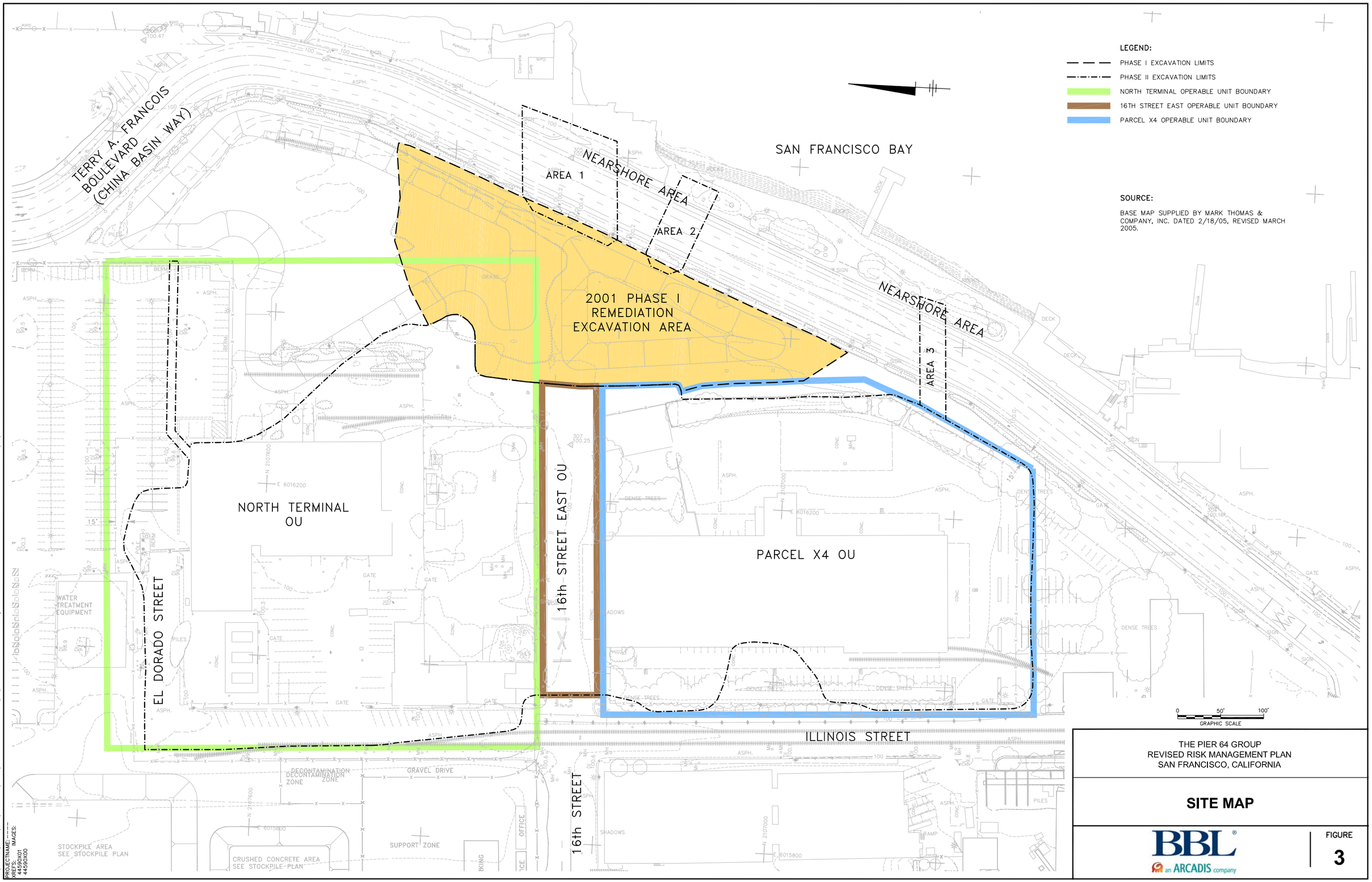
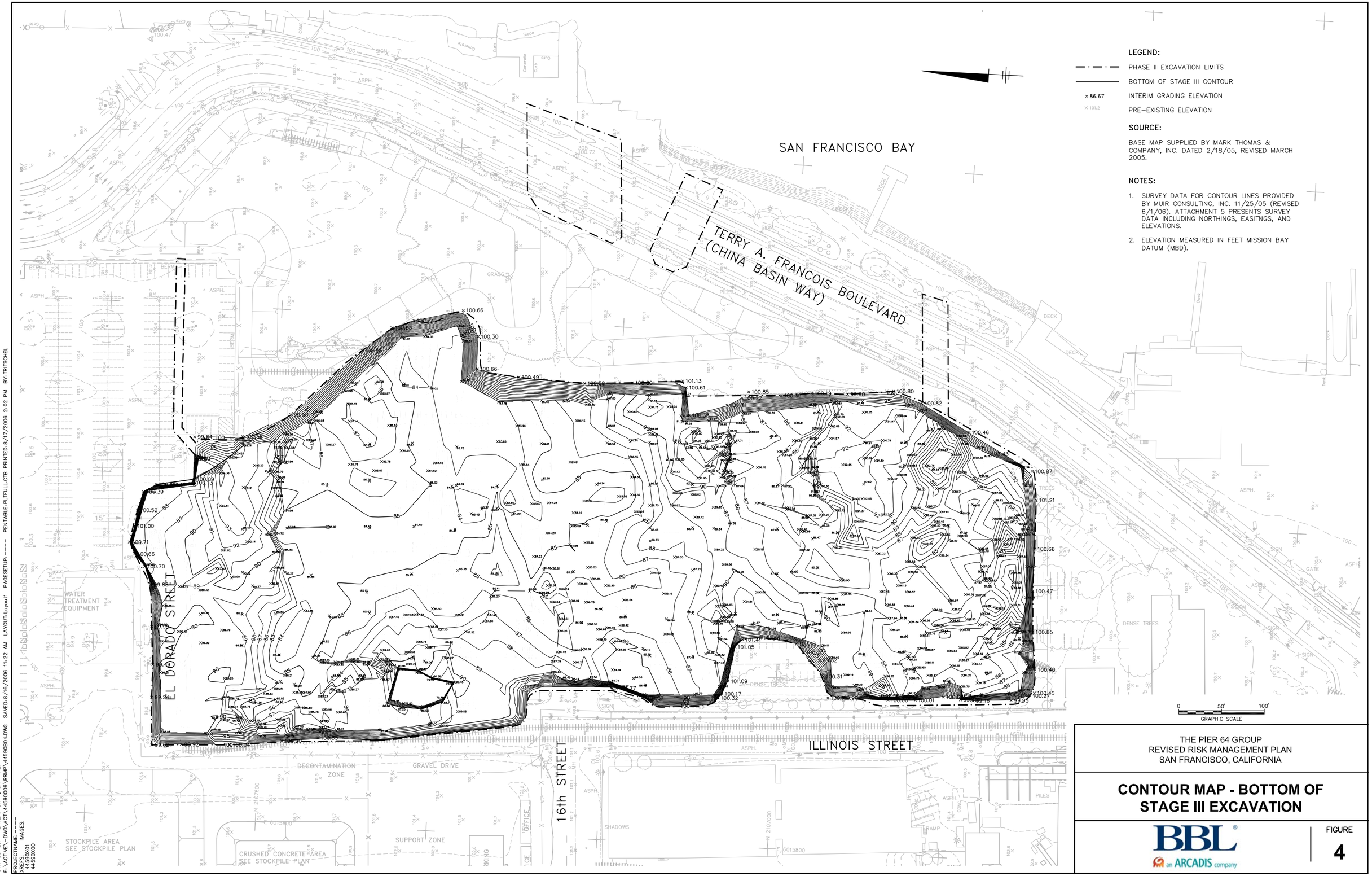


THE PIER 64 GROUP
REVISED RISK MANAGEMENT PLAN
SAN FRANCISCO, CALIFORNIA

SITE MAP

BBL an ARCADIS company

FIGURE 3



THE PIER 64 GROUP
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SAN FRANCISCO, CALIFORNIA

CONTOUR MAP - BOTTOM OF STAGE III EXCAVATION

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FIGURE 4