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DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED TRANS BAY CABLE PROJECT

Volume 2
Technical Appendices B-K

Prepared for:

City of Pittsburg
65 Civic Avenue
Pittsburg, CA 94565

Prepared by:

URS Corporation

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APPENDIX B NOP, RESPONSES, AND SCOPING MEETINGS

This appendix presents copies of the following items related to the Notice of Preparation, Scoping Meeting comments, and comment letters received from agencies and organizations:

- Notice of Preparation, August 23, 2004
- Letter from WaterKeepers, December 16, 2004
- Letter from Mike Lengyel, October 11, 2005
- Letter from City of Richmond, October 19, 2005
- Letter from Department of Fish and Game, October 19, 2005
- Pittsburg Public Scoping Session Minutes, October 19, 2005
- Letter from City of San Francisco Planning Department, October 21, 2005
- Proof of Publication for Scoping Meeting, San Francisco Chronicle, October 24, 2005
- Letter from Chevron Products Company, November 2, 2005
- San Francisco Public Scoping Session Minutes, November 3, 2005
- Letter from U.S. Army Corps of Engineers, December 8, 2005

CITY OF PITTSBURG PLANNING AND BUILDING DEPARTMENT
Notice of Preparation of a Draft Environmental Impact Report for the Proposed Trans Bay Cable Project (August 23, 2004)

To: **Distribution List**

Re: **Notice of Preparation (NOP) of a Draft Environmental Impact Report (EIR)**

Project: **Trans Bay Cable Project**

Location: **San Francisco Bay between the Cities of Pittsburg and San Francisco, California**

Introduction

The City of Pittsburg acting as lead agency under the California Environmental Quality Act (CEQA) has determined that the above referenced project may have a significant environmental impact and that an Environmental Impact Report (EIR) should be prepared for the Trans Bay Cable Project (Project).

The proposed Trans Bay Cable Project consists of installation of a 55-mile-long High Voltage Direct Current (HVDC) cable in San Francisco Bay, from a terminus in the City of Pittsburg in Contra Costa County to a terminus in the City of San Francisco in the vicinity of Potrero Point.

The intent of this document is to solicit comments from interested parties as to the nature and scope of the environmental information and analysis to be included in the EIR. We request input from responsible agencies which may need to utilize the EIR prepared by the City of Pittsburg when considering permit and other approvals that may be required as a result of the Project. Other interested parties and organizations are also invited to provide comments as to the scope of the EIR pertinent to their viewpoints. A summary of the proposed Project follows.

Project Background

The proposed Project involves a HVDC sub-sea transmission cable proposed by Trans Bay Cable LLC, a wholly-owned subsidiary of Babcock & Brown Power Operating Partners LLC, a San Francisco-based company, in cooperation with Pittsburg Power Company, a municipal utility. The Project is proposed to transmit electrical power and provide a

dedicated connection between the East Bay, which has excess electrical capacity and transmission grid congestion, and the electrical transmission and distribution facilities in San Francisco. The Project is designed to be a cost effective, energy efficient solution addressing San Francisco's need for additional transmission capacity and in-city generation, while improving transmission reliability and load serving capability. In addition, the Project has the potential to allow for the retirement of generation facilities in San Francisco including associated air emissions.

As stated above, the primary goal of the Project is to deliver generator-like electric capacity and energy to San Francisco to meet demand projected for the period 2008 and beyond. The proposed Project is anticipated to meet the California Independent System Operator (ISO) planning and reliability standards while improving load serving capability and creating economic benefit compared to Project costs. Should the Project be approved it will potentially reduce the need for in-city generation in the City of San Francisco, decrease transmission grid congestion in the East Bay, increase the overall security and reliability of the electrical system, improve the load serving capability and provide potential savings to ratepayers.

Project Description

The direct current (DC) cable being proposed utilizes HVDC technology and is available from several manufacturers. This technology has been utilized in numerous projects around the world. DC power is different from High Voltage Alternating Current (HVAC) technology in significant ways. It is controllable in a manner that mimics generation on the power delivery end and functions independently of problems in the alternating current (AC) grid. It has negligible magnetic fields, no AC EMF in the HVDC cable and can be more easily and inexpensively buried underground or underwater. HVDC becomes cost effective when transmission efficiency and reduced cable cost, over longer distances, offset the efficiency losses and costs for the HVAC to HVDC Converter Stations. The proposed HVDC cable would be bundled with a separate metallic return cable and a fiber optic communication cable. The fiber optic cable will ensure reliable communication between the Converter Stations in Pittsburg and San Francisco.

The proposed Project consists of the following major components:

- Approximately 55 miles of sub-sea HVDC cable (or if required, two cables separated) transmitting up to 750 megawatts (MW) of electrical power from the East Bay to San Francisco, with a likely capacity of 600 MW (Refer to Figure 1).
- Proposed 7.5-acre Converter Station site in Pittsburg (AC/DC)(refer to Figure 2).
- Proposed Converter Station site in San Francisco (DC/AC). The Converter Station site in San Francisco will be selected based on consultation with City staff, community

representatives and other private parties based on the technical, environmental and other criteria.

- Short segments of AC interties between the proposed Converter Stations and the existing local electrical substations; i.e., the Pacific Gas and Electric (PG&E) 230 kilovolt (kV) Pittsburg Substation and the PG&E Potrero 115 kV Substation in San Francisco.
- The proposed HVDC bundle would be made up of a transmission cable, a separate metallic return cable, and a fiber optic communication cable (refer to Figure 3). The fiber optic cable is included to ensure reliable backup communication between the Converter Stations in Pittsburg and San Francisco. The proposed cable bundle design does not need nor include any fluids or circulating gases for cooling.
- Adding connections to the existing PG&E Pittsburg and Potrero substations to accommodate the required AC interconnections between the existing substations at existing voltages and the proposed Converter Stations.

The proposed Project is presently configured to extend from PG&E's Pittsburg Substation near Pittsburg, California to the PG&E Potrero Substation located in San Francisco. At the Pittsburg end, a Converter Station or "terminal" would be installed to convert the power from system AC voltage to DC. At the San Francisco end, a similar terminal would be installed to convert the power from DC voltage back to system AC. The EIR to be prepared for the proposed project will consider alternative Converter Station sites in Pittsburg and San Francisco. At this time, the transmission capacity of the proposed Project is anticipated to be up to 750 MW.

The proposed HVDC transmission line between the two terminals consists of a transmission cable, a separate metallic return cable, and a fiber optic communication cable. The transmission cable would be approximately 5 inches in diameter and the return cable would be approximately 4 inches in diameter. The combined bundle would be approximately 10 inches in diameter. The cable would be buried underwater and routed from the Pittsburg Converter Station into the water at Honker Bay and Suisun Bay (New York Slough), through the Carquinez Strait and San Francisco Bay to a landing point near the San Francisco-based Converter Station. See Figure 1 for the currently proposed cable route and Converter Station locations. See Figure 2 for preliminary diagram of the proposed Converter Station location and related facilities in Pittsburg.

The Project is scheduled to take approximately two (2) years to construct. The major activities include: approximately one (1) year to manufacture the converter station equipment and HVDC cable; approximately one (1) year to construct the converter station with its AC inter-ties; and approximately 30 working days required to install the underwater HVDC cable bundle.

Installation of the 55-mile-long HVDC cable bundle in San Francisco Bay from the City of Pittsburg to a terminus in the City of San Francisco is designed to be carried out with the least intrusive technology. Installation of the HVDC cable bundle would be performed by a ship (refer to Figure 3) specially designed for the task. Depending on the water depth and sub-sea soil conditions, the cable bundle would be buried using either a jet plow, which is towed behind the ship, or a water jet tool, which is a remotely operated vehicle (ROV). The jet plow gently fluidizes the sea bottom, plows a trench, and places the cable bundle in the trench where plowed and loose materials fall back into the trench and cover the cable. The ROV fluidizes the sea bottom and places the cable into the fluidized material, where the loose, fluidized material settles back covering the cable. Where the cable crosses dredged navigation channels, it may be necessary to use a clamshell bucket dredge to a limited extent to install the cable at a sufficient depth.

Project approvals, permitting and development activities are scheduled to be complete in 2005, at which time construction will commence. If approved, the Project is planned to be complete and ready for commercial operation in late 2007 or early 2008.

Alternatives Being Considered

As required under CEQA, the EIR will evaluate alternatives to the proposed Project that are capable of attaining most of the project objectives, and could avoid or substantially reduce the potentially significant impacts posed by the Project. A reasonable range of alternatives will be reviewed and screened for further evaluation in the EIR. The EIR will consider:

No Project – The EIR will evaluate the impacts of not approving the Project.

Alternative Converter Station Sites and Associated AC/DC Transmission Line Routes. The proposed Converter Station site in Pittsburg is presently under option to Trans Bay Cable LLC from the City of Pittsburg. Under this alternative, other potential sites in Pittsburg will be studied in the EIR, including a location in an industrial area in the vicinity of West 10th Street, near PG&E's Pittsburg Substation. Potential sites in southeastern San Francisco will be studied in the EIR. In preliminary discussions concerning possible sites, the City and County of San Francisco and its Port Authority have indicated to Trans Bay Cable LLC that a decision to negotiate the use of a site under control of San Francisco or the Port will need to be informed by a community outreach effort, which the Project intends to accomplish as a part of the CEQA process. Depending upon the ultimate preferred site for a Converter Station in San Francisco, and after certification of a Final EIR by Pittsburg, the City and County of San Francisco and/or the Port Authority, acting as responsible agencies, are expected to consider the granting of any required real property interest as to a site, as well as associated easements, under their control.

BART Routing Alternative – Under this alternative, the transmission cables would be routed along the BART right-of-way from Pittsburg to San Francisco. The cables would be installed over approximately 47 miles, and the installation would include burial, placement along aboveground structures, and installation in the BART tube under the Bay.

Freeways and Surface Streets – Under this alternative, the HVDC cable system would be installed in the rights-of-way of the major highways in the area. These highways would include Highway 4, Interstate-680, Highway 24, possible sections of I-580, I-980, I-880 and various surface streets in Pittsburg and Oakland. The HVDC cable system would be located underground and supported on aboveground structures. Several options are available for routing the cable system for the area between Oakland and the Western Pacific Converter Station site in San Francisco (see Bay Crossing Alternatives below).

Bay Crossing Alternatives Related to East Bay Land Based Routings – These alternatives include: 1) entering the Trans Bay Tube in Oakland and exiting the Tube at the Embarcadero BART station in San Francisco. At that point, following surface streets to the PG&E Potrero Substation; 2) attach the cable system to the Bay Bridge by entering the existing utility corridor as well as the new utility corridors being constructed as part of the new fixed span for the Bay Bridge, then exit the Bay Bridge in San Francisco and follow surface streets to the PG&E Potrero Substation; 3) enter and cross the Bay with an HVDC submarine cable system.

Non-Transmission Alternatives – Construction of new power generation with sufficient capacity to meet San Francisco's demand, system enhancement, and renewable energy.

Other Transmission Alternatives – DC alternatives, AC technology.

Installation of Two HVDC Cables – Under this alternative, two separate HVDC cable bundles would be installed instead of one to provide the transmission capacity of the Project. This alternative would offer improved Project reliability and load serving capability.

List of Responsible Agencies

The proposed Project would require permits, reviews, consultations and related approvals that include, but may not be limited to, those listed below.

Federal Regulatory Agencies

- U.S. Army Corps of Engineers (USACE) – permits under Section 10, Rivers and Harbors Act; Section 404, Clean Water Act
- U.S. Fish and Wildlife Service (USFWS) – Section 7, Endangered Species Act (ESA)

- National Oceanic and Atmospheric Administration (NOAA) Fisheries Section 7, ESA; Magnusen-Stevens Act
- U.S. Coast Guard, reviewing agency (marine and navigation safety)

California State Regulatory Agencies

- California State Lands Commission (CSLC) – right-of-way lease
- California Department of Fish and Game (CDFG) – California ESA consultation
- California Department of Transportation (Caltrans) – encroachment permits
- California Department of Toxic Substances Control – hazardous waste handling and/or remediation, as applicable
- San Francisco Regional Water Quality Control Board (RWQCB) Section 401 Clean Water Act Certification
- Bay Area Air Quality Management District (BAAQMD)

Local Regulatory Agencies

- San Francisco Bay Conservation and Development Commission (BCDC)
- City/County and Port of San Francisco
- City of Pittsburg
- City of Richmond
- Solano County
- Contra Costa County
- Marin County

Environmental Issues to be Addressed in the EIR

The EIR will include an analysis of the potential environmental effects of the proposed action during construction, operations, and project termination, and an evaluation of mitigation measures that could avoid or reduce any identified significant adverse impacts. Environmental issues currently identified that will be evaluated in the EIR include:

- Air Quality
    - Vessel emissions during installation

- Construction emissions
- Impact of Project on redistribution of air emissions in the Bay Area resulting from the potential retirement of generation facilities in San Francisco

- Geologic Resources and Soils
  - Erosion and runoff from construction
  - Seismic considerations
  - Geohazards and soil stability
  - Potential alteration of seafloor contours and substrate, including hard bottom

- Terrestrial Biological Resources
  - Potential disturbance to listed species near landing sites and converter stations during construction
  - Noise effects on sensitive species during operation

- Marine Biological Resources
  - Disturbance to listed fish species and/or essential fish habitat during construction-construct during fish windows for salmon, steelhead, stripped bass, and herring.
  - Disturbance to eelgrass, other nursery habitats
  - Physical effects on benthic habitat from installation

- Water Resources and Water Quality
  - Temporary water quality effects resulting from suspended sediments during installation
  - Stormwater runoff and erosion during construction and operation
  - Water consumption during operations
  - Impact of Project on cooling water intake/discharge in the Bay associated with the potential retirement of generation facilities in San Francisco

- Noise
  - Construction equipment and vessel noise

- Noise generated by converter stations and above ground transmission facilities during operations

- Land/Marine Use and Recreation
  - Potential disruption to boating and other marine uses during installation
  - Interaction with other infrastructure on the seabed, e.g., pipelines and cable crossings
  - Potential for changes to shoreline and submerged land access
  - Cable placement in relation to anchorages, shipping/dredge channels
  - Disruption to adjacent land uses during construction of converter stations
  - Consistency with zoning at converter station sites
  - Consistency with BCDC policy regarding uses of the Bay

- Commercial and Recreational Fishing
  - Temporary preclusion of fishing during installation and repairs
  - Potential effects on fishing stocks

- Risk of Upset/Public Safety
  - Risks to fishermen and other marine users if cable snagged
  - Repair duration and transmission contingencies
  - Vessel fuel spills and response
  - Construction safety
  - Emergencies and shut-downs

- Transportation
  - Disruption to vessel and surface transportation circulation during construction
  - Navigation safety considerations resulting from placement of cables in the bay
  - Absence of traffic during operations (unmanned)

- Socioeconomics
  - Construction-related revenues and employment
  - Fishing revenue impacts during installation

- Population and housing
- Revenue from local franchise(s), taxes, employment, leases

- Energy Use and Public Services
  - Consumption of public services, including fire or other emergency services
  - Disruption of other services (telecom, other networks) from transmission frequency, as applicable
  - Emergency response for cable repair

- Hazardous Materials and Human Health
  - Coating, other treatment on cables
  - Hazardous materials used and/or encountered during construction
  - On-site storage and use of chemicals at Converter Station sites during operations
  - Electromagnetic Fields

- Aesthetics, Light, and Glare
  - Cable-laying vessel size, presence, and lighting during installation
  - Construction staging, duration, and lighting
  - Building (Converter Stations) footprint, profile in context of setting
  - Converter Station external lighting and visibility to residential receptors

- Cultural Resources
  - Shipwrecks and other submerged resources
  - Cultural resources at landing sites
  - Disruption during construction

- Cumulative Impacts
  - Dredging, other activity in Bay involving seabed disturbance
  - Other projects and activities in vicinity of Converter Stations

- Environmental Justice

- Converter Station and onshore transmission component locations

Public Scoping Meetings

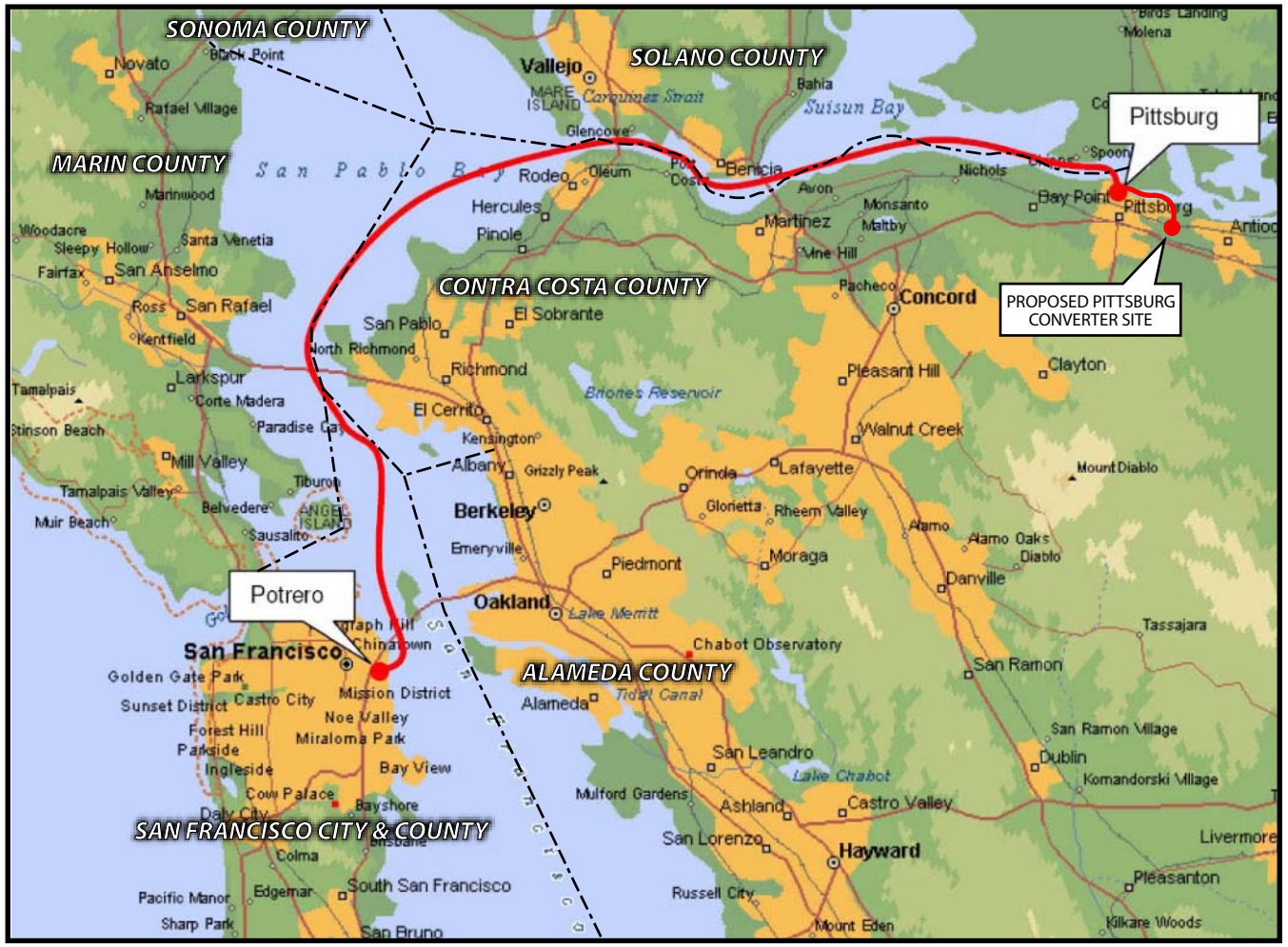
It is currently anticipated that public scoping meetings will be held in the Cities of Pittsburg and San Francisco as early as September 2004. A separate notice will be sent regarding the specific scoping meeting locations, dates, and times.

Comments on this NOP are due by September 22, 2004 and can be forwarded to Mr. Randy Jerome, City of Pittsburg Planning Director at the following address:

Mr. Randy Jerome
Planning and Building Director
City of Pittsburg
65 Civic Avenue
Pittsburg, CA 94565-3814
rjerome@ci.pittsburg.ca.us

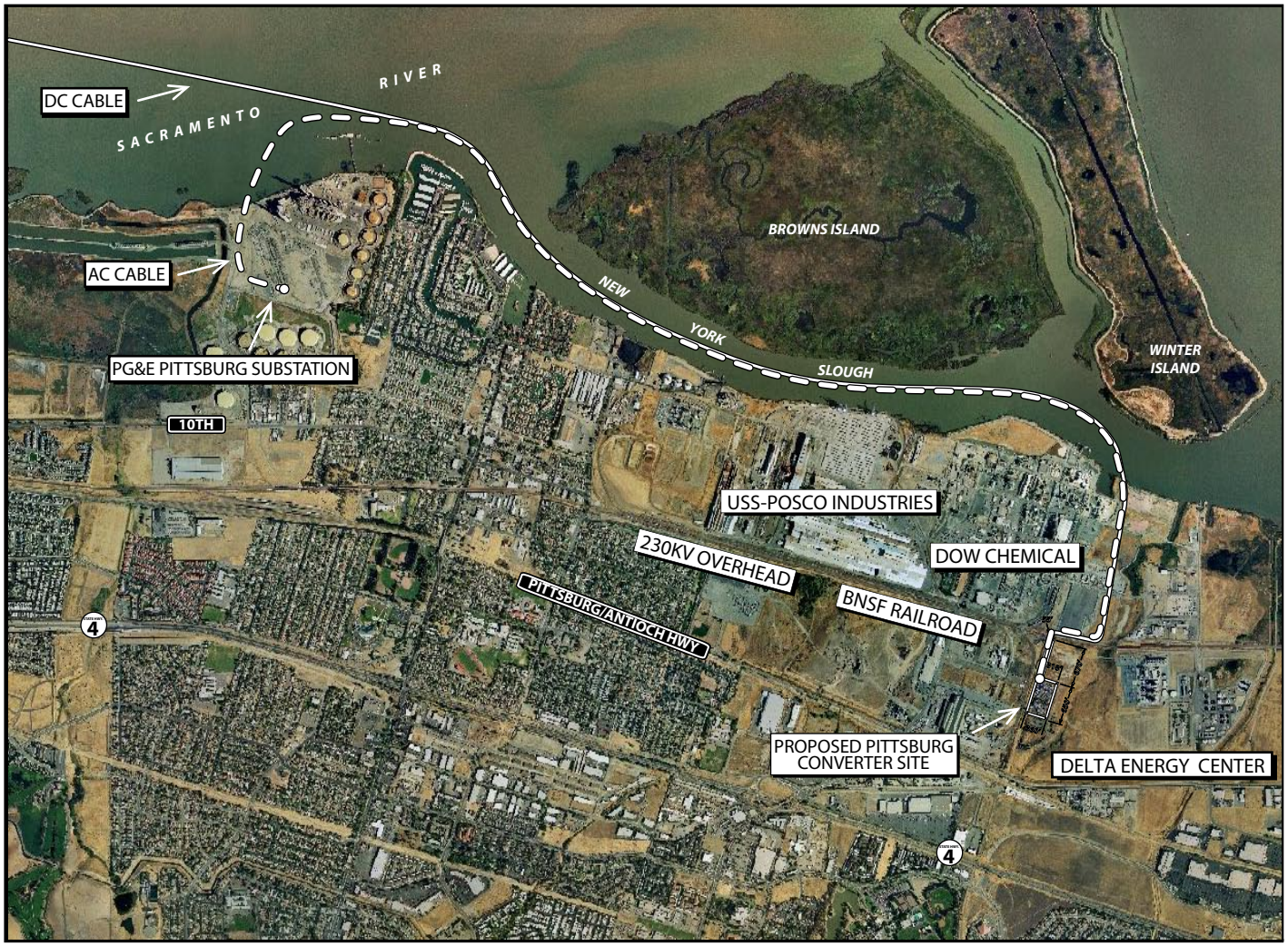
(FIGURE 1) TRANS BAY CABLE PROJECT

-SUBMARINE CABLE ROUTE-



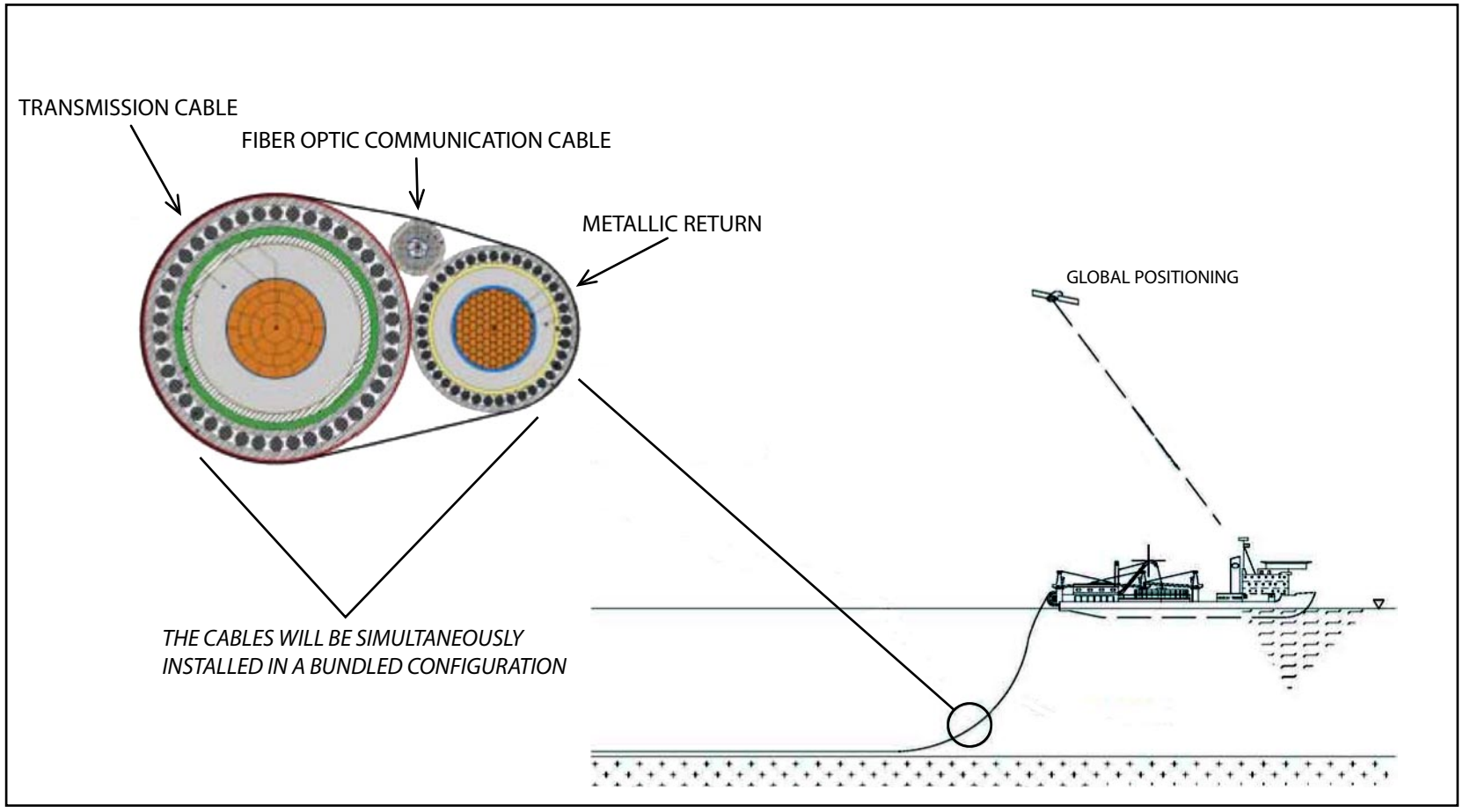
(FIGURE 2) TRANS BAY CABLE PROJECT

-PROPOSED CONVERTER SITE AND INTERCONNECTION TO PG&E PITTSBURG SUBSTATION-



(FIGURE 3) TRANS BAY CABLE PROJECT

-TYPICAL HVDC CABLE BUNDLE CROSS SECTION-



WaterKeepers

December 16, 2004

Babcock & Brown Power Operating Partners LLC
2 Harrison Street, 6th Floor
San Francisco, CA 94105

Dear David Parquet and the Trans Bay Cable Project Planning Team:

On behalf of San Francisco Baykeeper, a project of Waterkeepers of Northern California ("Baykeeper") we offer these preliminary comments on the proposed Trans Bay Cable Project.

First, let us thank you for your sincere effort to involve the community in the early stages of planning and environmental consideration for this project. We hope that these comments will serve to inform you of our concerns about a project this complex in our unique estuary and to bring about the most effective management of the Bay ecosystem and the most efficient use of your resources. These comments are brief due to Baykeeper's limited involvement and thus do not preclude any future concerns that Baykeeper may have of the final monitoring plan, EIR, final plan implementation, or any unforeseen impacts. It is these impacts that we urge you to identify now, early in the process, before a great deal of capital investment has been put forth.

General Comments

Overall, the Trans Bay Cable project is commendable in its goals. The City of San Francisco now relies on a limited power delivery system that is vulnerable to service interruptions. It will come under further pressure as the population grows and the infrastructure continues to age. The current power plants at Potrero Hill and Hunter's Point are relics of a bygone era, evading many of the regulations that govern modern power plants. They pollute the air and water with NOx, SO_2, ground level ozone, particulate matter, and heavy metals. These plants are scheduled for retirement in 2006-8. A viable alternative must emerge to supply power to the city. The 'generation-rich' East Bay provides an attractive solution to this problem – if an effective delivery route can be found.

San Francisco BayKeeper DeltaKeeper Petaluma RiverKeeper

WaterKeepers Northern California, 55 Hawthorne Street, Suite 550, San Francisco, California 94105-3924 P 415.856.0444 FAX 415.856.0443 www.waterkeepers.org

The current plan, to bury a Bundled HVDC cable in the sediment from Pittsburg, through Suisin, San Pablo, and North San Francisco Bays to Potrero Point has been put forth as the most viable alternative at this time. As the Project Coordinators have explained, it has become possible to undertake such a project as advancements in the technology of underwater vehicles have reduced both cost and uncertainty of cable installation. The Project Coordinators have described projects very similar to this one that have met with great success around the world.

While this technology may be well suited for some cases, we cannot assume it is appropriate in all cases. Not all seabeds are the same. The San Francisco Bay Estuary is not like open ocean of the Irish Sea or The Bass Strait, where the Irish and Tazmanians have been well served by trans-oceanic cables. We have been directed to two projects that are most similar to the Transbay Cable proposal: the Cross-Sound Cable across Long Island Sound (NY) and the NEPTUNE project in the Raritan watershed (NJ). We point out that both have been set with problems that have stalled their successful completion. The San Francisco Bay shares many of the challenges of these projects – nearby urban areas, heavy boat traffic, sensitive benthic habitats, and large fishing communities. Our Bay also shares a particular troubling feature with the NEPTUNE project, which is currently stalled indefinitely. Both have a long history of contamination. Our central concern with the Trans Bay Cable Project is that by disturbing six square feet of sediment over 55 miles of the Bay, huge amounts of this toxic contamination, currently entombed in the Bay floor, could become suspended in the water column and enter the food chain.

With a watershed of 63,000 square miles, the estuary drains 40% of the land area of California through an opening of less than 4000 feet at the Golden Gate. It has been the ultimate repository for the runoff from the many mining operations and industrial facilities that have been established here since the time of the Gold Rush. The Sacramento Valley, which drains into the watershed, has been one of the most heavily farmed regions of the world for over a hundred years. During this time, millions of tons of pesticides and herbicides have been applied to the land. Many of the chemicals applied to the land between 1950 and 1975 have been found to be carcinogenic, teratogenic, or in other ways toxic and have thus been banned. Currently, the San Francisco Regional Water Quality Control Board oversees 21 Superfund sites; 19 toxic pit sites; 2000 spills, leaks, and cleanups; 10,000 fuel leak sites; and 50 brownfields in the area, many on the immediate shoreline. (Wolfe, Nov 6, 2004) A great many compounds have run into the Bay,

directly along the proposed route of this project. Many of them have a natural attraction to organic material, so as they enter the water column, they adsorb, or attach to the outside of, sediment particles and settle to the bottom. Over time, they are covered over by more sediment and become trapped in the Bay floor.

The most dangerous of these compounds are those designed in the early years of chemical engineering, a time when chemical engineers were able to synthesize an extraordinary array of compounds but before doctors and scientists became aware of the long term problems they would pose. They are often incredibly stable and resistant to decay. Many can interfere with the delicate processes of life. They pose no harm when buried in sediment, but if they are released into the food chain, they gain entry into the bodies of aquatic wildlife and thus, into the bodies of fish-eating humans. The active sediment layer, from which sediment is currently re-suspended due to wave and tidal action is no more than 33cm, perhaps as little at 10 cm in San Pablo and Suisin Bays, comprising between 3 and 10 years of accumulation (assuming a sediment accumulation rate of 3.1 cm/yr). (Davis, 2003; Fuller et al., 1999) The proposed project could re-suspend sediment buried up to 2m deep. By liquefying this sediment, comprising 80 to 150 years of accumulation, (Fuller et al., 1999) this project could release a vast number of dangerous compounds into the food chain. We urge that adequate studies be undertaken to determine the ultimate consequences of fluidizing such contaminated sediment.

Specific Comments

History of Contamination

San Francisco Bay is one of the few large estuaries on the western coast of North America. Its watershed comprises 63,000 square miles, 40% of the total surface area of the State of California. It has a long history of chemical contamination. Evidence shows that from the first years of Spanish settlement in 1769, toxic compounds were already beginning to accumulate in the sediment of the Bay floor, perhaps as a result of clearing the land by fire. (van Geen and Luoma (1999) citing Hornberger, et al. (1999)) The contamination accelerated during the late nineteenth century as mining operations in the Sierra Nevada foothills released toxic heavy metals, especially mercury, from the hillsides. These metals ran into rivers and settled into the sediment of the Bay and Delta. Soon after these mining operations began, agriculture in the Central Valley expanded

dramatically, driven by irrigation water diverted from these same rivers. During the twentieth century, millions of tons of fertilizer, herbicides, and pesticides spilled off this farmland into the Bay. Early compounds, such as the inorganic arsenicals were dangerous in their own right, but between the two World Wars a new generation of chemists was synthesizing far more dangerous chemicals, among them the chlorinated hydrocarbons. These, which include the chlorinated hydrocarbon insecticides (DDT, dieldrin, chlordane, toxaphene, etc.), PCBs, and dioxins, have not only been shown to be dangerous to human systems but are particularly resistant to decay, especially when suspended in sediment. They were banned from manufacture in the 1970s, but in the intervening 50 years of use and illegal disposal, many tons were dumped into the Bay. The contamination continues today. In heavily farmed areas, between 1,250 and 4,300 pounds of pesticides are used per square mile annually. (TBI (1998) citing Brown and Caldwell (1990)) A 1992 report by the San Francisco Estuary Project estimates that current toxic release is on the order of thousands of metric tons per year. (Monroe and Kelly, 1992)

Many of the contaminants mentioned above have low water solubility and thus partition quickly out of the water column. If they are not ingested by an aquatic animal, they are likely to attach to sediment particles, settle to the bottom, and become embedded in the sediment. (Davis, 2004, Ling et al. 1993) They are persistent in the environment, bioaccumulative in the food chain, and have a profound effect on human health. Of particular alarm are their carcinogenic properties and their effect on the proper development of the human fetus. Our central concern with the Trans Bay Cable Project is that by disturbing six square feet of sediment over 55 miles of the Bay, huge amounts of these toxic chemicals could become suspended in the water column and enter the food chain. It should be noted that sediment in upstream locations has shown to be more contaminated than downstream locations. (Vankatesan et al., 1999) The portion of the cable buried in Suisun Bay is particularly worrisome.

Due to considerations for recreational anchors, the cable must be buried 1 to 2 meters deep in this sediment along its entire 55 mile path. To accomplish this, a hydroplow will direct water at a pressure upwards of 100 psi into Bay floor, disturbing between 27,000 cubic meters and 54,000 cubic meters of sediment. The sediment will 'fluidize' and the cable will sink to the appropriate regulated depth. Not enough is known about this process. Specifically, to what extent will the chemicals entombed in this liquefied sediment be released into the aquatic environment? We urge that the proper studies be undertaken to answer this

question. Of particular concern is sediment from the years of greatest Chlorinated Hydrocarbon (CHC) contamination, between 1950 and 1975.

Through conversations with colleagues at NY/NJ Baykeeper regarding their experiences with the proposed NEPTUNE project, we have come to understand that dredging may be required to achieve favorable bottom conditions for the hydroplow. We have not been made aware of any dredging required in this project. Dredging can have significant impacts on the Bay floor. We urge that any dredging activity be undertaken with the greatest caution and consideration for this sensitive and important habitat.

Special Areas of Concern

Suisin Bay

The coastline west of Pittsburgh is heavily industrialized, and we would recommend particular sensitivity when disrupting the sediment in this area. As the proposed route leaves Pittsburgh heading west, it passes a shoreline with a long history of military and industrial tenants. It passes first by a sewage outfall at Mallard Island and around Stake Point, where the General Chemical Bay Point Works chemical plant stands just before Middle Point. Beginning with this facility, we pass a long stretch of potentially contaminated coastline. The Concord Naval Weapons Station encompasses 7,000 acres along two miles of shoreline from Belloma Slough to Pacheco Creek and also includes Seal, Roe, and Ryer Islands to the north. It was from this well-protected port that the Navy provided munitions for its Pacific fleet during WWII, Korea, and Vietnam. It is included in the National Priorities List (Superfund) program, identifying it as one of the most highly contaminated sites in the country. According to this program administered by EPA, "Soil, sediments, and surface water are contaminated with heavy metals including zinc, copper, lead, cadmium, and arsenic, as well as SVOC [(semi)volatile organic compounds] and pesticides... Tidal action in the wetlands inundated the sources, carrying contamination to Suisun Bay." (USEPA) On the east side of the Weapons Station, is Pacheco Creek. Upstream in this creek stands the Tosco Avon Oil Refinery. The process of refining petroleum produces many harmful byproducts, including dioxin, which are discharged into this creek and flow to the Bay. To the West, there are additional petroleum refineries, discharging these same toxic compounds into the Bay.

These facilities were built along this shoreline in part because the Bay provides a convenient repository for their outflow. Chemicals from these sites may lie suspended in the sediment today. This stretch of almost 15 miles from Pittsburg to Davis Point is an area of special concern, requiring testing at a more frequent interval than 1000 yards. If the contamination is too great, an alternative route, north of Ryer Island, could be explored.

Potrero Point

There is little doubt that the sediment around Potrero Point, the proposed terminus for the cable, has been heavily contaminated. We understand that the project design team is sensitive to this fact and will likely opt to use directional drilling technology to avoid re-suspending this sediment. We urge caution even with this seemingly benign approach, and recommend extensive testing and monitoring of this site.

Chemicals of Concern

Chlorinated Hydrocarbons (CHCs) –

CHCs are a family of chemicals characterized by one or more hydrocarbon rings attached to one or more chlorine atoms, and often other compounds. They have been released into the water as a result of an accident, such as an electrical transformer explosion, after agricultural application such as to protect crops from insects, or from illegal dumping. CHC exposure can impact many of the body's systems, with negative impact on proper respiratory, cardiovascular, gastrointestinal, endocrine, dermal, and ocular function. Many are listed by the EPA as 'probable human carcinogens'. (ATSDR – Chapter 3)

It is important to understand how these compounds came to exist. PCBs (polychlorinated biphenyls) are a class of 209 chemicals that were produced in mixtures known as Araclors by the Monsanto Company between 1929 and 1977. Commercial manufacture produces some combination of different congeners. Each of these congeners reacts differently with body. Their number classification is based on their number of chlorine atoms. The more chlorinated a PCB congener, the more resistant it is to decay. While UV-B or high temperatures will break up highly chlorinated PCBs, even the residual products persist in the environment. The highest levels of PCB contamination in San Pablo Bay are between 60-70 cm. (Venkatesan, 1999)

Furans (PCDFs) and dioxins (PCDDs) exist as byproducts of industrial processes and the combustion of other compounds, especially chlorophenols, chlorobenzenes, and PCBs. They are among the most toxic synthetic substances known to science. They are also highly persistent.

Chloronated hydrocarbon pesticides, including DDT, were first hailed as miracle chemicals when they were introduced in 1938. Their ability to protect crops from insects and other pests was unmatched. Unfortunately, they too are highly toxic to humans and wildlife. This was not fully understood until the 1970s, at which time they were banned for use in the United States. In the intervening years, millions of tons ran into Bay after rains or illegal dumping. These chemicals are highly persistent and remain in the sediment today.

Health Effects

Given the brief nature of these comments, we will only discuss one pathway of negative health effects – the manipulation of endocrine function. The CDC provides a full discussion of health effects through the Agency for Toxic Substances and Disease Registry's catalogue of Toxicological Profiles.

Many CHCs and their metabolites affect the proper balance of hormones in the body by mimicking their chemical and physical properties in several different ways. They can fool the brain into thinking there is a high level of a particular hormone in the blood, triggering it to send the signal to stop producing that hormone, with a resultant shortage. They can bind to the chemicals that are meant to neutralize the hormone, with a resulting overload. They can induce or suppress the production of enzymes in the liver meant to metabolize the hormone, again changing the natural levels. Any of these, or a combination of several, will have a profound effect on the body.

Two examples of affected hormones are the thyroid hormone and estrogen. Both play vital roles in the delicate and irreversible process of prenatal development.

During development the thyroid hormone directs process of organizing the developing brain. For the period between 8 weeks, when brain development begins, and the time of thyroid hormone production (10 – 12 weeks), the fetus relies on thyroid hormone from its mother. A thyroid deficiency during this period results in cretinism, with symptoms including deaf-mutism, spasticity, gait disturbances, profound mental retardation, and complete or partial inability to stand. (Porterfield and Hendry (1998) citing Stanbury (1984); Donati et al.

(1992); Rogan and Ragan (2003)) Even after this period, a lack of thyroid hormone can impair neurological development, shown later in life as learning and behavioral disorders such as attention problems, impaired memory and diminished spatial perception. Brain development continues until several weeks after birth and can be affected by CHCs that are secreted through a mother's breast milk. (Klein, 1972) Such problems have been reported in a study of children born in the early 1980s to women who had eaten large amounts of Great Lakes fish shown to have high CHC levels. (Jacobson and Jacobson, 1996) They continue to become increasingly common in our society.

Estrogen levels can also be affected, especially by DDT and other pesticides that were used so heavily in the Central Valley. A male exposed to estrogen mimicking compounds can develop malformed sexual organs and feminized behavior. (Vreugdenhil et al., 2002; Skakkebæk et al., 2001) Sterility or more serious consequences will result. Although the mother's estrogen will not cross through the placenta, estrogen mimicking chemicals from outside the body do cross into the fetus' bloodstream. Other compounds, such as some of the dioxins, work in the opposite way, binding to the receptors meant for estrogen without activating them. This leads to an estrogen deficiency, especially damaging to the female fetus. (Soto, et al., 1994; Lascombe, et al., 2000)

Heavy Metals

Heavy metals exist naturally in the earth's crust and naturally leach into the environment in low levels. Human activities such as mining and the burning of fossil fuels can release these metals at much higher levels. Such mining began in earnest in our watershed in the mid 19th century with the discovery of gold in the Sierra foothills. Miners diverted water from rivers and forced it into high pressure jets to remove the rock from the hillside. This released naturally occurring metals, especially mercury and cadmium. Mercury was also used as an amalgam to extract the pure gold from alluvium ores and then dumped directly into the watershed.

Mercury comes out of the ground in its metallic or inorganic form, which is not a great threat to humans. In the environment, though, microorganisms metabolize it into methylmercury, which is lipophilic and as such becomes much more dangerous to wildlife and humans alike. Methylmercury is a known neurotoxin. Symptoms of exposure include impaired peripheral vision, hearing, taste, and smell; slurred speech; unsteadiness of gait and limbs; muscle weakness; irritability; memory loss; depression ; and sleeping difficulties. It also damages

the kidneys and causes death in high doses. Children, particularly fetuses and newborns, are quite sensitive to mercury exposure. Many of their systems continue to develop into their teenage years and exposure to mercury can interfere with this development. (ATSDR – Chapter 3)

All of these compounds exist in the sediment of our estuary. If they are released into the water column, they will enter the food chain, eventually accumulating in the large, predatory, long-living fish that humans eat. Because the chemicals accumulate over time, the levels in a fish's meat can be millions of times higher than in the surrounding water. Thousands of people eat these fish caught from the Bay each year. Our first priority should be to the health of these people and the health of their families.

Suggestions

The following are specific suggestions to ensure that this project will have minimal impact on human health and aquatic wildlife.

Take sediment core samples at more frequent intervals

As we have shown, much of the proposed route has the potential for heavy sediment contamination, much of it localized. The current plan to test sediment cores every 1000 yards may not accurately reflect this heavy contamination. Especially along the southern shoreline of Suisin Bay, we suggest a more rigorous monitoring program.

Take sediment core samples to an appropriate depth

Especially in soft sediment, the cable will need to be placed deeper than the one meter standard to avoid recreational marine anchors. The high organic content and fine sediment particles of these softer surfaces also make them more attractive to contaminants. Sediment cores should be taken at a depth consistent with the planned depth of the cable.

Use best detection methods available

It is not appropriate to group chemicals by class. Many chemicals within one class can act quite differently. In order to accurately detect what chemicals are present in sediment, it is necessary to use a high resolution gas chromatograph or electron capture detection. (ATSDR – Chapter 7) These expensive tests are necessary given what we know about contamination of Bay sediment and its potential health effects.

Investigate technology for sediment removal
If it is found that the sediment along the proposed route would release chemicals such that their presence in the water exceeds acceptable limits, it may be necessary to work with Pirelli and other contractors to devise a method for removing the contaminated sediment in an environmentally sound manner and covering the cable with clean sediment.

Recognize incomplete science
Throughout each stage of testing and design, it is important to recognize that society's understanding of certain processes is not definitive. Many of the chemicals suspended in the sediment have not been tested for health effects or environmental persistence. Chemicals can act synergistically within the body and the water column, one multiplying the effect of another by hundreds of times (Van Birgelen et al., 1996). Any decisions should err on the side of caution, especially as many effects are irreversible and occur society-wide. There are several models for evaluating the rate of chemical re-suspension into the water column. We urge you to consult several before making any conclusions.

Explore Alternative Routes
Baykeeper would encourage another look at the BART Trans Bay Tube/Federal Highway route to Pittsburgh. With security concerns, it would undoubtedly be difficult to implement this plan, but if sediment contamination proves to be extensive, it may be more efficient to come up with a way to prevent security breaches rather than manage polluted sediment.

Understand historical contamination
In discussions with the Project Coordinators and Engineering team, some questions arose about the depth at which contaminated sediment in the Bay lies as well as the depth of the Active Sediment Layer. We recommend that these questions be resolved as soon as possible. See the Davis, Fuller and Ling papers referenced below for a discussion of these topics.

Understand impacts to benthic communities
This letter has dealt primarily with Bay sediment contamination and its impacts on aquatic wildlife and human health. This letter does not preclude further comment on the sensitivity of the benthic communities impacted by this proposal. We urge that a full understanding of the project's impact on the benthic habitat be developed.

Please contact us if you have a question about these comments. And once again, thank you for this opportunity to provide input.

Sincerely,

Avi Ringer
Policy and Research Intern
Waterkeepers Northern California

Sejal Choksi
San Francisco Baykeeper
Waterkeepers Northern California

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Oct. 11, 2005

Trans Bay Cable Project
Informational Session
The Pittsburg Yacht Club
2 Marina Blvd.
Pittsburg, CA 94565

Dear Sirs:

Here are several questions on which information would be appreciated:

1. If the project will redistribute air emissions from San Francisco to Pittsburg, will the project sponsors contribute to identifying and lessening lung-related disease in Pittsburg/Bay Point?

2. What are the identities, capacities and annual pollution loads of the power generating facilities feeding the Pittsburg substation?

3. Does the cable project have the potential to induce further power generating facilities in the local area?

Thank you for your consideration

Mike Lengyel
545 Central Ave.
Pittsburg CA 94565

ALEXIS

Attention: **Project Mgr. Samuel Wehn**

Date: 10/18/05

Company: Babcock & Brown

Number of Pages: 3

Fax Number: 1-415-267-1500

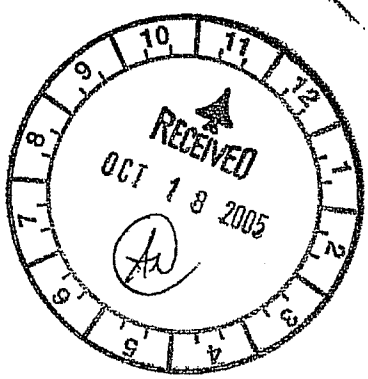
Voice Number: 1-415-267-1599

From: **M.S. Lengyel**

Company:

Fax Number: 1-925-439-1439

Voice Number: 1-925-439-1439



Subject: Trans Bay Cable Questions & Asthma squib

Comments:

Dear Mr. Wehn:

This is fax of query letter presented at Pittsburg Yacht Club informational meeting last week, along with a squip from Calpine's web site on asthma. Calpine apparently is a gold sponsor nationwide of a lung association asthma walk. It was good to talk to you today. Thank you for your insights.

Mike Lengyel
Pittsburg

Oct. 19, 2005

Environmental Impact Report
Scope Meeting
Pittsburg City Hall
65 Civic Avenue
Pittsburg, CA 94565

Re; Health Mitigation Fund From Trans Bay Cable Project

Dear Sirs:

The closure of Hunter Point and Potrero Hills Power Plants in San Francisco will improve the air quality there, but not in Pittsburg, which will help supply power lost through the closure and bear the burden of power plant pollution.

Since the City of Pittsburg and Trans Bay Cable will be making money off the project, a small portion of the profits should be devoted to providing an Asthma and Breathing Clinic in Pittsburg or similar program to lessen the burden.

Such a clinic, as a collaborative of Contra Costa County, the local healthcare district and the schools, could provide inhalers, air purifiers and lung function screening. A sum of $50,000 a year each from Pittsburg and Trans Bay Cable for 10 years could establish a pilot program.

Please also address three question forwarded to Trans Bay last week during a meeting at the Pittsburg Yacht Club (attached)

Thank you for your consideration.

Mike Lengyel
545 Central Ave.
Pittsburg CA 94565

Attachment

Printed on Recycled Paper

Community & Economic Development Department
Steve Duran, Director

City of Richmond

October 19, 2005

Joan Lamphier, Principal
Lamphier-Gregory
1944 Embarcadero
Oakland, CA 94606

Dear Ms. Lamphier:

I have received the public notice for the Environmental Scoping meeting in the Trans Bay Cable Project, in Pittsburg tonight; unfortunately, I am unable to attend.

I understand that the transbay cable will run under water through Richmond, just off the San Pablo Peninsula. Therefore, I appreciate being notified of the meetings and request that I receive copies of all meeting minutes, environmental documents, and other documents relating to the design, engineering and implementation of the project. I will make sure that all the appropriate officials here in the City of Richmond get copies.

Good luck with this exciting project. It sounds like a good thing for Pittsburg and the greater Bay Area.

Thank you for keeping Richmond apprised of this project. Please feel free to give me a call at 510-231-3066 on this matter. I look forward to learning more about it.

Sincerely,

Steve Duran
Community & Economic Development Agency Director

SD:cdg

cc: Bill Lindsay, City Manager

1401 Marina Way South, P.O. Box 4046, Richmond, California 94804
Telephone: (510) 231-3047 Fax: (510) 307-8195 http://www.ci.richmond.ca.us

State of California – The Resources Agency
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
POST OFFICE BOX 47
YOUNTVILLE, CALIFORNIA 94599
(707) 944-5500

ARNOLD SCHWARZENEGGER, Governor

October 19, 2005

Mr. Kenneth W. Strelo
City of Pittsburgh
Planning Department
65 Civic Avenue
Pittsburgh, CA 94565

Dear Mr. Strelo:

Trans Bay Cable Project
San Francisco Bay and City of Pittsburgh
Contra Costa County

The Department of Fish and Game (DFG) has reviewed the document for the subject project. Please be advised this project may result in changes to fish and wildlife resources as described in the California Code of Regulations, Title 14, Section 753.5(d)(1)(A)-(G)[1]. Therefore, if you are preparing an Environmental Impact Report or an Initial Study and Negative Declaration for this project, a de minimis determination is not appropriate, and an environmental filing fee as required under Fish and Game Code Section 711.4(d) should be paid to the Contra Costa County Clerk on or before filing of the Notice of Determination for this project.

A complete assessment of the flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, and locally unique species and sensitive habitats, should be provided. Rare, threatened and endangered species to be addressed should include all those which meet the California Environmental Quality Act (CEQA) definition (see CEQA Guidelines, Section 15380). The assessment should identify any rare plants and rare natural communities, following DFG's Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities (revised May 8, 2000). The Guidelines are available at www.dfg.ca.gov/whdab/pdfs/guideplt.pdf

If you have any questions, please contact Mr. Carl Wilcox, Habitat Conservation Manager, at (707) 944-5525.

Sincerely,

Robert W. Floerke
Regional Manager
Central Coast Region

[1] http://ccr.oal.ca.gov/. Find California Code of Regulations, Title 14 Natural Resources, Division 1, Section 753

TRANS BAY CABLE PROJECT

SCOPING SESSION MINUTES

October 19, 2005

A meeting of the Trans Bay Cable Project Scoping Meeting was called to order by Planning Consultant Randy Jerome, at 7:00 P.M. on Wednesday, October 19, 2005 in the City Council Chambers, 65 Civic Avenue, Pittsburg, California.

Present: Randy Jerome, Planning Consultant
Ken Strelo, Associate Planner, City of Pittsburg
Garrett Evans, Manager, Pittsburg Power Company
Dave Parquet, Babcock and Brown
Sam Wehn, Babcock and Brown
Robert Ray, EIR Consultant, URS
Rudy Calderon, Lamphier-Gregory
Bill Martin, EIR Consultant, URS

WELCOME AND INTRODUCTORY REMARKS

Planning Consultant Randy Jerome welcomed everyone to the Scoping Session for the Environmental Impact Report (EIR) for the Trans Bay Cable Project. He advised that he had been the former Planning and Building Director for the City of Pittsburg, having retired in May 2005, although he remained under contract to work with the City and the applicant on the project.

Mr. Jerome reported that the City of Pittsburg had hired the firm of Lamphier-Gregory as a Consultant to help process the project. Since Joan Lamphier, the Principal of the firm, had been unable to attend the meeting, he would make the presentation.

Mr. Jerome advised that scoping sessions were governed by the California Environmental Quality Act (CEQA) and was an optional process whereby the public and other interested agencies could provide questions and input prior to the drafting of an EIR. Scoping sessions were not required but were involved with controversial or unusual projects, whereby a lead agency, in this instance the City of Pittsburg, must prepare an EIR. He explained that permits would be required from a number of agencies including the City of San Francisco, State, federal and local agencies that would be utilizing the EIR in making a determination as to the permits those agencies would require for a particular project.

The public was being asked to raise any questions on environmental issues that could be of concern relative to the project that citizens or interested parties might want to be forwarded to the consultant in the preparation of the EIR.

Mr. Jerome stated that the consultant would make a presentation on the process and the environmental impacts already identified. The project proponent, Babcock and Brown and its team would explain the project to the public, and Pittsburg Power Company (PPC) staff would also be asked to describe its role in the project.

PROJECT APPLICANT DISCUSSES PROJECT AND PROJECT OBJECTIVES

Sam Wehn, Babcock and Brown, introduced the applicant's team. He described the proposal for a 400 megawatt high voltage DC cable that would run from the City of Pittsburg to the City of San Francisco, 59 miles in length. The project was being proposed because of a need for generation in the City of San Francisco with a fair amount of generation being generated in the various parts of the East Bay. In order to serve the load in San Francisco, he explained that much of the electrons had to flow up the peninsula. Te proposed transmission line would run from the PG&E Substation in the City of Pittsburg to the Potrero PG&E Substation located in the City of San Francisco.

The project would provide added security to San Francisco, give the Independent System Operators (ISO) more of an opportunity to schedule power across the line and serve the load throughout the entire San Francisco Bay.

Mr. Wehn stated that the project would be developed, engineered and constructed by Babcock and Brown. Siemens would be the manufacturer of the converter stations, and Pirelli renamed Prysmian would be the manufacturer and installer of the cable. Once the project became commercial, Babcock and Brown would turn over the assets to the PPC and the rights to the transmission line to the ISO. Babcock and Brown would finance the project for the life of the project.

The converter station in Pittsburg would be primarily located on the Standard Oil site to the west of the Delta Energy Center (DEC) plant, with the intent to run the AC/DC line from there into the Bay and then between Browns and Winter Islands, to where the PG&E Substation was located. At that point the AC line would then drop into the PG&E 230 kv Substation. The DC line would continue to flow in the Bay and would then come out at the Potrero PG&E Substation. The converter station in San Francisco had been identified as the HWC site. The Pittsburg converter station would appear identical to the converter station in San Francisco. The AC line would come out from the Pittsburg converter station and be routed to the PG&E Substation at 115 kv.

A photo simulation of the Standard Oil site from the Pittsburg/Antioch Highway was presented showing buildings on one end and the remainder of the project to appear similar to any other substation in the country.

Mr. Wehn reported that Prysmian would manufacture the cable taking all 59 miles of cable to be mounted on a ship from Italy to San Francisco.

The cable would consist of a primary cable, metallic return cable and a fiber optic cable. As the cable unrolled off the back into the ship, all three cables would be wrapped together and would appear as if they were one single cable installed in the Bay. The firm would use a hydro plow to thread the cable into the bottom of the hydro cable. The cable would be three to six feet below the bottom of the Bay.

Describing how that would occur, Mr. Wehn stated that there would be small jets that would loosen the bottom of the Bay floor. The cables would then be inserted at the desired level in the Bay. The soils would be disturbed just enough to allow the cables to be inserted three to six feet below the bottom of the Bay. Geotechnical testing was due to start in November with the entire 59 miles of cable route to be reviewed to identify the soils along the bottom of the Bay. If the soils turned out to be rock, that area would be avoided since the cable should rest out of sight below the bottom of the Bay.

Mr. Wehn recognized that the Bay was an active shipping channel. As such, all efforts would be taken to avoid all shipping channels in the 59 mile route. Any crossing of a shipping channel would be done at a right angle. In speaking with the Army Corps of Engineers, the Coast Guard and the San Francisco Bay Pilots, it had been learned that the shipping channels were approximately 37 feet in depth, with some at potentially 45 to 47 feet. He noted that there was no federal money available at this time to increase the depth. The intent was to insert the cable below the 47 foot level so that in the event future monies were available to fund the channel project, the Trans Bay Cable would not pose a problem.

In response to comments from the audience, Mr. Wehn explained that the project would be designed to meet the noise level requirements of the City of Pittsburg, likely in the 60 to 70 dBA noise level range. The consultant would be working with the City to confirm those issues. It was likely that there would be a humming noise associated with the project in Pittsburg, not unlike sounds from the PG&E substation today.

ROLE OF PITTSBURG POWER COMPANY

General Manager of the Pittsburg Power Company Garrett Evans explained that the Pittsburg Power Company (PPC) had started in 1996 with the operation and ownership of the electric and gas system on Mare Island in the City of Vallejo. He explained that under the Government Code, municipal utilities were allowed to own and operate enterprises outside of their boundaries.

The PPC had later teamed with Enron and Calpine for the siting and construction of the Los Medanos Energy Center on Third Street and the Delta Energy Center on the Pittsburg/Antioch Highway.

PPC had also worked with Calpine to site a transmission line and rights-of-way through the

downtown Eighth Street Corridor/Linear Park area to the PG& E substation. PPC had been in negotiations with other entities but had not finalized anything for other projects outside of the area. One study under design was to run power through the community and offer it to the City of Pittsburg proper.

Mr. Evans explained that the PPC had fallen into a long term strategy to expand its portfolio of projects and programs so that it could generate more funds for the City to bring better services, more parks, and police. He reported that there was over $500,000 that would go into the City's General Fund for this year's budget to help fund police and other types of services through the PPC.

Mr. Evans added that 3,000 megawatts of power generation surrounded the Pittsburg community. The Trans Bay Cable Project would not be a generation specific activity and would not call for any new generation. It was something being used as an asset in the community and running it across to the City of San Francisco. He noted that certain documents had shown some generation taken away or retired in five to ten years at the discretion of the companies that owned those power plants. The PPC would work to support those efforts.

EIR CONSULTANTS DISCUSSED SCOPE AND FOCUS OF EIR

Robert Ray, Senior Project Manager, URS Corporation, explained that the EIR would assess the potential environmental effects of the proposed action to build the converter stations and the cable during construction and operation of the proposed project. The EIR would also consider alternatives to the proposal. The project would involve the DC cable in the Bay, on shore converter stations in Pittsburg and San Francisco, and two alternative sites on each end along with the associated on-shore AC alternating current and direct current routes associated with each alternative.

As part of the EIR, mitigation measures would be identified and evaluated to avoid or reduce any identified significant adverse impacts associated with the proposed and alternative projects. The environmental issue areas and the alternatives planned to be addressed in the EIR had been outlined in a Notice of Preparation issued in August 2004.

The key issues to be addressed were identified as the potential project effects on water quality and sensitive biological resources in San Francisco Bay, short term construction impacts associated with traffic, noise and air quality, associated public health affects, long term impacts related to visual resources, noise, safety and reliability. The EIR would also provide an alternatives analysis that would assess alternatives to the proposed project both in terms of converter station locations and cable routes, as well as other alternatives that might be able to feasibly obtain the objectives of the proposed project.
Further, the EIR would address air quality issues. The primary contents of the EIR

would include the project description forming the basis of the environmental impact assessment, including a detailed description of the project with more details on the project to support the environmental analysis and to describe the alternatives to be considered, a description of existing conditions and the affected environment of the proposed project and alternatives. It would also address the environmental impacts associated with implementation and operation of the project and mitigation measures, as well as the assessment of the residual impacts that would remain with the implementation of necessary mitigation measures where appropriate.

Mr. Jerome advised that another scoping session had been scheduled for November 3, 2005 in San Francisco. After the EIR had been prepared, it would return to the City of Pittsburg for entitlements necessary for the approval of the project in Pittsburg which would also be required in San Francisco and would include subsequent permits from the other associated agencies. At this time, he welcomed any comments from the public.

QUESTION AND ANSWER SESSION

MIKE LENGYEL, Pittsburg understood that there were approximately 3,000 megawatts of power in Pittsburg and around the City and that each megawatt of power would generate approximately 1.5 tons of pollution annually. He suggested that would result in a pollution load to the City of approximately 4,500 tons a year. He understood that the project would result in the closure of the Hunter's Point and Potrero Hills power plants in San Francisco where there had been a high level of asthma and lung cancer, although he acknowledged that there were a lot of other stresses in that area. He estimated the net loss of megawatts in San Francisco at approximately 400 megawatts, translating to 600 tons of pollution in San Francisco. While the project would eliminate that pollution in San Francisco, he stated it would remain in Pittsburg.

Mr. Lengyel recommended health mitigation measures for asthma or other breathing problems since the project would represent a culmination of emissions from Enron and Calpine, particularly since the emissions would be shifted or eliminated from San Francisco to Pittsburg.

Mr. Lengyel suggested that a collaborative be considered whereby the City could recoup the access charges from those that would use the cable which could improve the air quality in Pittsburg by staffing or engaging in a collaborative with the County, with local health care districts and with school districts to operate an asthma and breathing clinic on a periodic basis. He understood that Calpine had a similar program to address asthma.

Mr. Lengyel also questioned whether or not the project would redistribute air emissions from San Francisco to Pittsburg and questioned whether or not the project sponsors

would contribute to lessening lung related diseases in Pittsburg/Bay Point. He also questioned whether or not the cable project would have the potential to induce future power generating facilities in the local area. He offered his comments in written form and presented them to staff.

JOE DAVI, Pittsburg, questioned the percentage of the power being produced in Pittsburg that would be transferred to San Francisco.

DAVE PARQUET, Babcock and Brown, explained that one of the consequences of the project was not to shut down generation in San Francisco. The project that would cause generation to shut down in San Francisco was a transmission line being constructed by PG&E on the Jefferson/Martin Line and which would cause the shut down of the Hunter's Point Power Plant. As planned and as the ISO intended, a new smaller power plant in San Francisco, the Little Peaker project, would likely cause the shut down of the Potrero Power Plant.

Mr. Parquet stated that the subject project would follow behind those projects and would connect two substations together. The net result of that connection would be a more efficient grid such that the actual generation of power in the Bay Area would be reduced by 20 megawatts. Currently all the power flowed around the southern end of the Bay and up the peninsula and when it short cut across from Pittsburg it would be efficient enough that the losses in power traveling to San Francisco and other locations in the Bay Area would be reduced. Independent analysis and an ISO analysis had shown that reduction to be approximately 20 megawatts.

As to the percentage of power being generated that would be shipped to San Francisco, Mr. Parquet explained that was difficult to determine in that the Bay Area involved an interconnected web of transmission lines. How each of those lines spoke to each of the power plants and other substations was difficult to determine. While Babcock and Brown had attempted to make that determination, as had the ISO, there was no concurrence as to what would occur.

Mr. Parquet advised that Babcock and Brown would like to obtain the ISO analysis on that issue, although he was uncertain that analysis would be released.

Mr. Parquet added that as part of the planning for the project, Babcock and Brown had completed a System Impact Study and had paid PG&E to analyze how the project fit into the grid, what it would do and how it would do it. One of the assumptions in the study related to the power plants in Pittsburg was that in the plan the ISO had taken away the RMR contracts which were currently subsidized. He added that those contracts might be eliminated in the future since those plants, by their nature, were old and could not continue to be subsidized.
That would involve the entire Mirant Power Plant which had been included in the consultant's study as directed by PG&E.

In further response to Mr. Davi, Mr. Parquet explained that the projected life of the project, as proposed, would be at least 40 to 50 years. The existing power plants had not been designed for that period, although there were many that were that old. The old Pittsburg PG&E plant had been constructed to last 40 to 50 years. While the plants built in the 1950's had not been expected to run as well, they had.

Mr. Parquet reported that PG&E had a Request for Proposal (RFP) in process to identify the construction of new power plants. The new plants would allow the older plants to be shut down.

GEORGE DEL MONTE, Pittsburg understood that the older power plants in the City were inefficient and would be replaced with newer equipment. An older power plant near his home appeared to run infrequently.

Mr. Parquet commented that the older plants were inefficient and were more expensive to operate. Since those plants were inefficient, the ISO had paid older plants a subsidy since they were necessary to provide needed power. Once there were other plants available, the subsidy would be eliminated and the owners of those plants would have to decide whether or not to keep those plants operating. The Los Medanos and Delta Energy Center plants ran more since they were newer facilities.

CLOSING REMARKS

Mr. Jerome thanked everyone for attending the meeting and for providing comments.

Mr. Ray advised that the next step would be to issue the Draft EIR (DEIR) in January 2006 and to issue the Final EIR (FEIR) by the end of May 2006. Comments would continue to be solicited on the DEIR with those comments to be responded to in writing in the FEIR.

Mr. Jerome added that those who had signed the sign-in sheet would be informed when the DEIR was ready to be circulated with requested copies to be provided by the City. Per CEQA, the DEIR had a review period of 45 days whereby anyone had a 45 day period to ask any questions or provide any comments on the document. All comments would be responded to by the EIR consultant and would comprise the FEIR. Once the FEIR had been completed, the City of Pittsburg and other agencies would use that document to make a decision on the project.

Mr. Jerome clarified, when asked, that the alternatives to the project site for the converter stations in Pittsburg and San Francisco would also be evaluated and analyzed in depth.
If alternative sites were used, they would already have been covered by the EIR and no Supplemental EIR would be required.

Mr. Wehn reiterated that in Pittsburg the primary site would be the Standard Oil site, although they were looking at a site on West Tenth Street near the Mirant Power Plant adjacent to the 115 kv Substation. In San Francisco, a site south of the HWC site was being considered, as was a site north of another Mirant site. All sites would be evaluated equally in the EIR.

Mr. Jerome advised that Trans Bay Cable had a link on the City's website where information was available. A list of City contact persons was also available. He reminded everyone that the next meeting had been scheduled for November 3 in San Francisco. When completed, the DEIR would be circulated and require a Notice of Completion, with copies to be provided to various agencies through the State Clearinghouse. The public would also be informed when the DEIR was available. Those who had signed the sign-in sheet would be provided with notices as well.

ADJOURNMENT

There being no further business, the meeting adjourned at 7:45 P.M. to the next Trans Bay Cable Scoping Meeting scheduled for November 3, 2005 in San Francisco.

PLANNING DEPARTMENT

City and County of San Francisco • 1660 Mission Street, Suite 500 • San Francisco, California • 94103-2414

MAIN NUMBER	DIRECTOR'S OFFICE	ZONING ADMINISTRATOR	PLANNING INFORMATION	COMMISSION CALENDAR
(415) 558-6378	PHONE: 558-6411	PHONE: 558-6350	PHONE: 558-6377	INFO: 558-6422
	4TH FLOOR	5TH FLOOR	MAJOR ENVIRONMENTAL	INTERNET WEB SITE
	FAX: 558-6426	FAX: 558-6409	FAX: 558-5991	WWW.SFGOV.ORG/PLANNING

October 21, 2005

Joan Lamphier, Principal
Lamphier-Gregory
1944 Embarcadero
Oakland, CA 94606

Dear Ms. Lamphier:

In the preparation of the EIR for the Trans Bay Cable Project, we would greatly appreciate it if you would include an alternative location for the project's San Francisco waterfront terminus.

We have enclosed a graphic showing the site we are proposing for the EIR to consider. Its location on the northern edge of Pier 80 is identified in the graphic as the possible alternative site. The property is under the jurisdiction of the San Francisco Port. That agency is aware of this request.

Please call should you have any questions.

Sincerely,

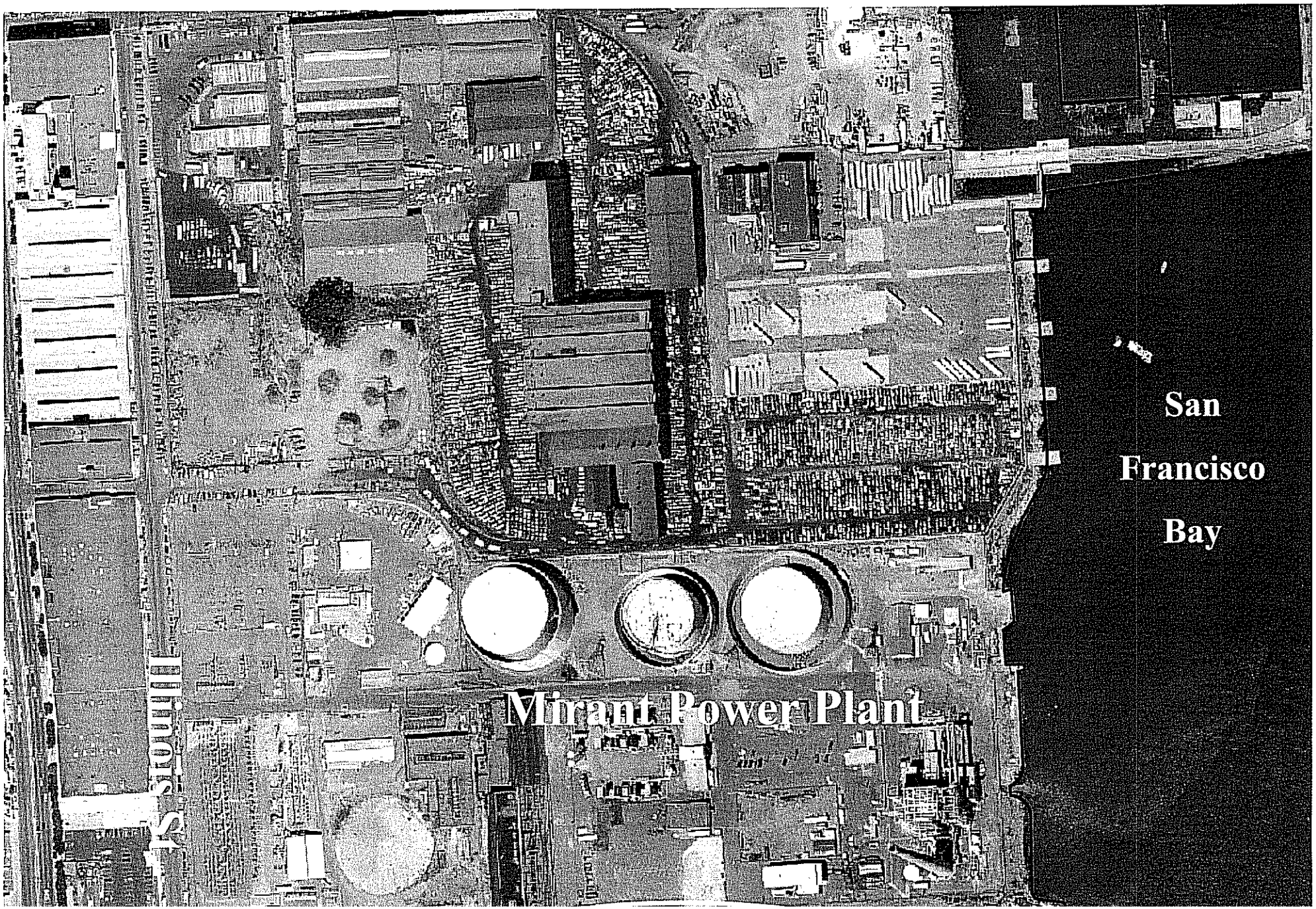
Dean Macris
Director of Planning

Enclosure

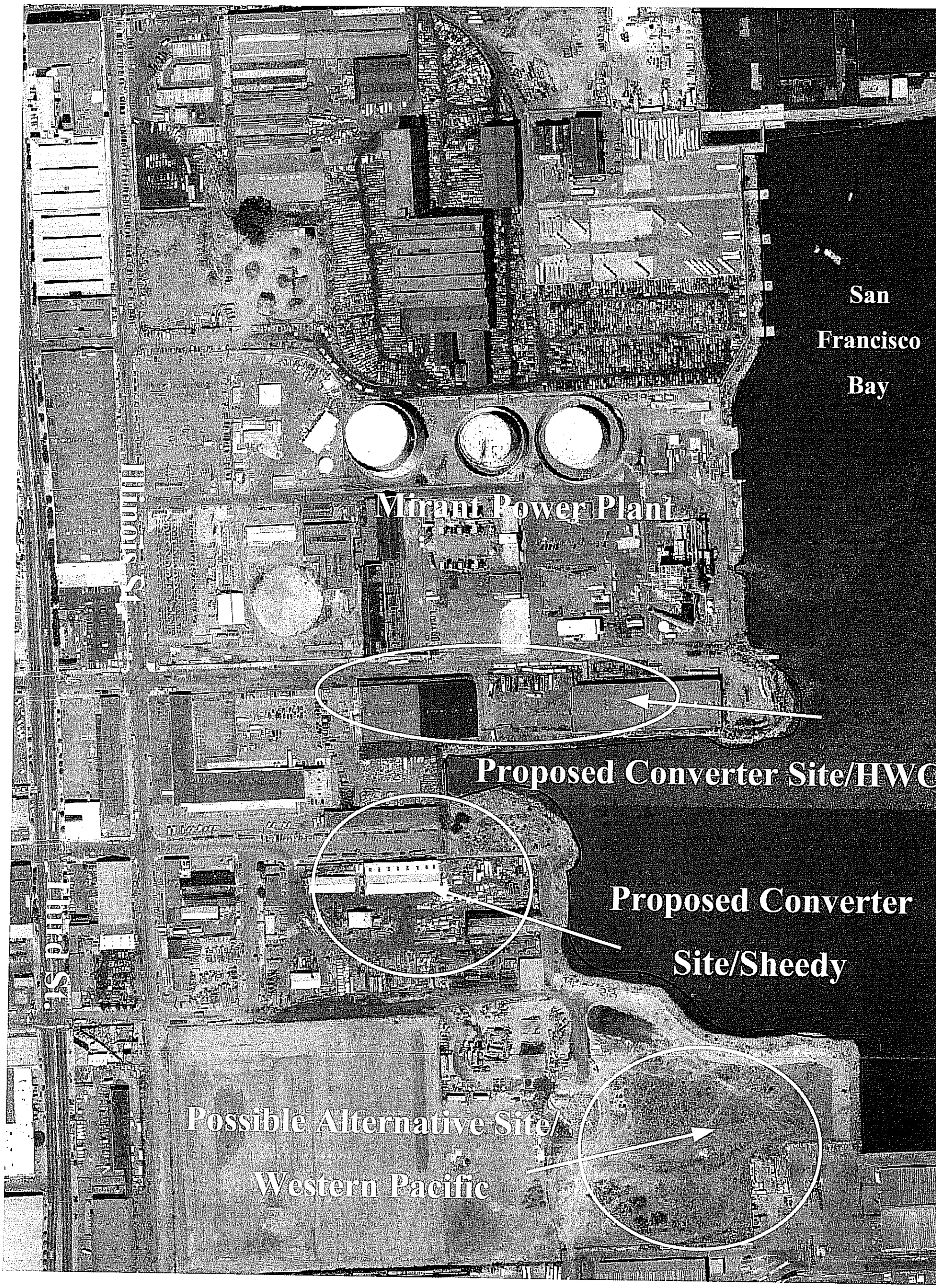
cc: Paul Maltzer
Diane Oshima, S.F. Port

DLM:mkg
N:\Director\Letter to Joan Lamphier - Trans Bay Cable.doc

TRANSBAY CABLE PROJECT EIR



TRANSBAY CABLE PROJECT EIR



Central Waterfront Area

San Francisco, CA

N

1" = 250

SAN FRANCISCO CHRONICLE

901 MISSION ST, SAN FRANCISCO, CA 94103
Telephone (415) 615-3562 / Fax (415) 348-3084

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(2015.5 C.C.P.)

State of California)
County of SAN FRANCISCO) ss

Notice Type: GPN - GOVT PUBLIC NOTICE

Ad Description: ENVIRONMENTAL SCOPING MEETING

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the SAN FRANCISCO CHRONICLE, a newspaper published in the English language in the city of SAN FRANCISCO, county of SAN FRANCISCO, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of SAN FRANCISCO, State of California, under date 11/13/1951, Case No. 411596. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

10/24/2005

Executed on: 10/26/2005
At SAN FRANCISCO, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Susan Goodall
Signature

CNS#: 883848

CITY OF PITTSBURG PLANNING & BUILDING DEPARTMENT
65 CIVIC AVENUE PITTSBURG, CALIFORNIA 94565
925-252-4920

Public Notice

Environmental Scoping Meeting
Preparation of Environmental Impact Report
Request for Comments

The City of Pittsburg is preparing an Environmental Impact Report (EIR) document on the Trans Bay Cable Project in order to satisfy the requirements of the California Environmental Quality Act (CEQA). The City of Pittsburg is the lead agency under CEQA for the preparation of the EIR.

PROJECT: The proposed Trans Bay Cable Project consists of installation of a 59-mile long High Voltage Direct Current (HVDC) cable in San Francisco Bay, from a terminus in the City of Pittsburg in Contra Costa County to a terminus in the City of San Francisco in the vicinity of Potrero Point. The Project is proposed to transmit electrical power from a converter station in Pittsburg to a converter station in San Francisco, providing a dedicated connection between the East Bay, which has excess electrical capacity and transmission grid congestion and San Francisco. This electrical power delivered to San Francisco would meet the City's demand projected for 2008 and beyond. The Project is designed to be a cost effective, energy efficient solution addressing San Francisco's need for additional transmission capacity and in-city generation, while improving transmission reliability and load serving capability.

PURPOSE OF THE SCOPING MEETING: The purpose of the meeting is to solicit comments from the public and to identify environmental issues that are most relevant or of most concern regarding implementation of the proposed Project and its alternatives, so that these issues can be analyzed in depth in the Draft EIR. Representatives of the independent environmental consulting firm preparing the environmental document will be in attendance.

DATE AND LOCATION: The open house will take place Thursday, November 3, 2005, from 7:00 p.m. to 9:00 p.m. at the Potrero Hill Neighborhood House, 953 DeHaro Street San Francisco, California. Individuals may drop in anytime during the meeting. The building where the scoping meeting will be held is wheelchair accessible.

FILING ENVIRONMENTAL COMMENTS: Interested persons and agencies are invited to participate in the environmental review scoping process. Comments may be submitted at the scoping meeting on November 3, 2005.

FOR FURTHER INFORMATION CONTACT:
Joan Lamphier, Principal
Lamphier-Gregory
1944 Embarcadero
Oakland, Ca. 94606
510-535-6690
10/24/2005

Walton W. Gill
Government Affairs
Manager

Chevron Products Company
Public & Government Affairs
841 Chevron Way
Richmond, CA 94804
Tel (510) 242-3585
Fax (510) 242-3515

November 2, 2005

Ms. Joan Lamphier, Principal
Lamphier-Gregory
1944 Embarcadero
Oakland, CA 94606

RE: Trans Bay Electrical Cable Project

Dear Ms. Lamphier:

Chevron recently received notice that you are soliciting input on the preparation of the Environmental Impact Report for the City of Pittsburg's proposed Trans Bay Cable Project. Chevron is concerned that the location of the cable may have an adverse impact on the safe and reliable operation of the marine facility at the Chevron Richmond Refinery, and would like to ensure that this is given due consideration in the EIR.

The Chevron Richmond Refinery is the largest refinery in the Bay Area and a major supplier of motor fuels, aviation and jet fuel, and lubricants for the local economy. The Chevron Long Wharf is the primary source of raw materials and finished products being transported in and out of the Refinery. We would ask that the EIR and project design ensure that the cable is placed in a location and depth that will not interfere with our annual dredging operations, or the safe and reliable flow of the extensive amount of large ship movement in and out of the Marine Terminal.

We would also ask that you consult with both the U.S. Army Corp of Engineers and U.S. Coast Guard in addressing marine and dredging issues in the EIR and project design. We look forward to working with you to ensure that this is a safe and well designed project.

Sincerely,

Walt Gill

Attachment

cc: Captain William J. Uberti, U.S. Coast Guard
Lt. Col. Philip T. Feir, U.S. Army Corps of Engineers
Ms. Ellen Johnck, Executive Director- Bay Planning Coalition
Mr. Randy Jerome, Planning and Building Director- City of Pittsburg

TRANS BAY CABLE PROJECT

SCOPING SESSION MINUTES

November 3, 2005

A meeting of the Trans Bay Cable Project Scoping Meeting was called to order by Planning Consultant Randy Jerome at 7:15 P.M. on Thursday, November 3, 2005 in the Potrero Hill Neighborhood House, 953 DeHaro Street, San Francisco, California.

Present: Randy Jerome, Planning Consultant
Garrett Evans, Manager Pittsburg Power Company
Dave Parquet and Sam Wehn, Babcock and Brown
Ian Austin, EIR Consultants, URS
Lindsay Martin, Siemens
Rudy Calderon, Lamphier-Gregory

WELCOME AND INTRODUCTORY REMARKS:

Planning Consultant Randy Jerome welcomed everyone to the Scoping Session for the Environmental Impact Report (EIR) for the Trans Bay Cable Project. He advised that he was the former Planning and Building Director for the City of Pittsburg, having retired in May 2005, although he had remained under contract to work with the City and the applicant on the project.

Mr. Jerome explained that scoping sessions were governed under the California Environmental Quality Act (CEQA) and were an optional process whereby the public and other interested agencies could provide questions and input prior to the drafting of an EIR. Scoping sessions were not required but were utilized with controversial and unusual projects whereby a lead agency, in this instance the City of Pittsburg, must prepare the EIR. Permits would be required from a number of agencies including the City of San Francisco as well as State, federal and local agencies that would be utilizing the EIR in making a determination on the permits those agencies would require for a particular project. The purpose of the scoping session was to solicit comments from the public on issues that should be studied and evaluated in the EIR.

With the City of Pittsburg as the lead agency, Mr. Jerome reported that the City was leading the effort on the EIR. The City had hired the consulting firm of Lamphier-Gregory as a Consultant to help in processing the project. He advised that Joan Lamphier, the Principal of the firm, had been unable to attend the meeting. He would be making the presentation during the session and would be working with the City of Pittsburg on the processing of the EIR.

Mr. Jerome stated that the public was being asked to raise any questions on environmental issues that could be of concern relative to the project that citizens or interested parties might have. Those questions or concerns would be forwarded to the consultant in the preparation of the EIR.

Mr. Jerome advised that the consultant would make a presentation on the process and environmental impacts already identified. The project proponent, Babcock and Brown and its team would explain the project to the public and Pittsburg Power Company (PPC) staff would also be asked to explain the City's role in the project.

ROLE OF PITTSBURG POWER COMPANY

General Manager of the Pittsburg Power Company Garrett Evans explained that the Pittsburg Power Company (PPC) was a municipal utility formed in 1996. Its first foray was the operation and ownership of the electric and gas system on Mare Island in the City of Vallejo. He explained that municipal utilities were allowed to own and operate enterprises outside of their boundaries under the Government Code. The PPC had later teamed with Enron and Calpine for the siting and construction of the Los Medanos Energy Center and the Delta Energy Center.

Mr. Evans described the City of Pittsburg as an industrial rich community with Dow Chemical and U.S. Steel and nearly 3,000 megawatts of existing power generation. Some of the units were older. The PPC was working with the owners of those older units to retire the older stations. The long term strategy of the PPC was to expand its portfolio of projects and programs so that it could generate more funds for the City to provide better services, more parks, senior programs, housing, jobs and police services. That was the key use of excess funds currently being generated.

Mr. Jerome explained that the EIR would be utilized by the various agencies for evaluation of permits for the project. The document would be utilized by the City of Pittsburg as the lead agency for its City Council and Planning Commission on whether or not to approve or disapprove a particular project. The focus of the scoping session was to solicit comments on any environmental issues in San Francisco that should be analyzed and studied in the document.

PROJECT APPLICANT DISCUSSES PROJECT AND PROJECT OBJECTIVES

Sam Wehn, Babcock and Brown, described the proposal for a 400 megawatt high current transmission line that would run from the City of Pittsburg to the City of San Francisco, 59 miles in length with two converter stations to be connected by a direct current (DC) cable. The project had been proposed because of the need for generation in the City of San Francisco with a fair amount of generation being generated in the various parts of the East Bay.

In order to serve the load in San Francisco, much of the electrons had to flow up the peninsula. The proposed transmission line would run from the PG&E Substation located in the City of Pittsburg to the Potrero PG&E Substation located in the City of San Francisco. The project would provide added security to San Francisco, give the Independent System Operators (ISO) more of an opportunity to schedule power across the line, and serve the load throughout the entire San Francisco Bay.

Mr. Wehn explained that once the project became commercial, Babcock and Brown would turn over the assets to the PPC and the rights to the transmission line to the ISO. Babcock and Brown would finance the project for the life of the project.

The converter station in Pittsburg would be primarily located on the Standard Oil site to the west of the Delta Energy Center (DEC) plant, with the intent to run the AC/DC line from there into the Bay and then between Brown and Winter Islands, to where the PG&E Substation was located and where the AC line would then drop into the PG&E 230 kv Substation. The DC line would continue to flow in the Bay and would then come out at the Potrero PG&E Substation. The converter station in San Francisco had been identified as the HWC site. The Pittsburg converter station would appear identical to the converter station in San Francisco. The AC (alternating current) line would come out from the Pittsburg converter station and be routed to the PG&E Substation at 115 kv. The converter stations converted AC back to DC and DC back to AC.

A hydroplow would be used to thread the cable into the Bay, with the cable to be three to six feet below the bottom of the Bay and pulled by either a barge, ship or both to be used for installation since there were some shallow spots in the Bay. From there to Pittsburg the cable would likely be installed by a barge. Geotechnical testing was due to start in the next month with the entire 59 miles of cable route to be reviewed to identify the soils along the bottom of the Bay. If the soils turned out to be rock it would be avoided since the cable should rest out of sight within the Bay bottom.

Mr. Wehn recognized that the Bay was an active shipping channel. He emphasized the efforts to cooperate with all associated agencies to avoid all shipping channels in the 59 mile route.

Mr. Jerome reiterated that the City of Pittsburg was the lead agency, under CEQA, and was responsible for the preparation of the EIR. An application had been filed with the City of Pittsburg as part of the process, triggering the EIR requirement. Discussions with the various agencies were ongoing as to how the project should be designed with input from public agencies. The City had prepared a Notice of Preparation which had been sent to the State which had mailed it to various agencies that had the opportunity to raise any concerns from a public agency point of view.

The EIR, to be prepared by the City of Pittsburg, would be used by the various public agencies in making a decision. Since most cities did not have the staff or resources to prepare an EIR, a consultant was typically retained to prepare the document. URS Corporation had been retained to prepare the EIR for the Trans Bay Cable project.

EIR CONSULTANTS DISCUSSED SCOPE AND FOCUS OF EIR

IAN AUSTIN, URS Corporation, San Francisco, explained that URS Corporation had been retained by Babcock and Brown to prepare the EIR to assess the potential environmental effects of the proposed action to build the converter stations and cable during construction and operation of the proposed project. The EIR would also consider alternatives to that project. The project would involve the DC cable in the Bay, on shore converter stations in Pittsburg and San Francisco, and two alternative sites on each end along with the associated on-shore AC alternating current and direct current routes associated with each alternative.

As part of the EIR, mitigation measures would be identified and evaluated to avoid or reduce any identified significant adverse impacts associated with the proposed and alternative projects. Environmental issue areas and alternatives planned to be addressed in the EIR had been outlined in a Notice of Preparation issued in August 2004.

The environmental issue areas and alternatives currently planned to be addressed in the EIR had been laid out in the Notice of Preparation. The key issues to be addressed included the potential project effects on water quality and sensitive biological resources in San Francisco Bay, short term construction impacts associated with traffic, noise and air quality, associated public health effects, long term impacts related to visual resources, noise, safety and reliability.

The EIR would provide an alternatives analysis that would assess alternatives to the proposed project both in terms of converter station locations and cable routes, as well as other alternatives that might satisfy the objectives of the proposed project. It would also address air quality issues. The primary contents of the EIR would include the project description forming the basis of the environmental impact assessment, including a detailed description of the project and with more details on the project to support the environmental analysis and to describe the alternatives to be considered along with a description of existing conditions and the effected environment of the proposed project.
Mr. Austin further explained that alternatives to the project would be evaluated, including alternative locations for the converter stations at both ends of the cable route, alternatives to connect Pittsburg to San Francisco such as the possible use of the BART line from Pittsburg to San Francisco to carry the cable, use of the Capitol Corridor line, or through Oakland and over the hills into Pittsburg.
The EIR would also address the environmental impacts associated with implementation

and operation of the project and an assessment of the residual impacts that would remain with the implementation of necessary mitigation measures where appropriate.

Mr. Austin added that the vessel from Italy that would ship the product material would be evaluated for potential air and noise impacts, possible noise impacts during the construction phase in both Pittsburg and San Francisco in terms of truck traffic, impacts to marine biology, short term impacts from traffic, noise public safety and potential long term impacts from electromagnetic fields (EMF) and visual impacts.

Mr. Austin advised that the Draft EIR would likely be issued in January 2006.

Mr. Jerome described the process for the solicitation of comments. At this time, he welcomed comments from the public.

QUESTION AND ANSWER SESSION

LURILLA HARRIS, B.H.E.S.S.I.G., 196 Putnam, San Francisco, expressed a desire for as much green energy as much as possible with as little coal burning as possible. She questioned the potential impacts to marine life, not just to fish but to seals, sea lions and otters which should be addressed in the EIR.

FRANCISCO DA COSTA, 4909 3rd Street, San Francisco, explained that he had attended a number of stakeholder meetings over the past year. He asked that the EIR address a region wide assessment of the transmission lines due to the substations on the southeast side of San Francisco and the impacts of older power plants where the population of the southeast sector had been negatively impacted. He also asked that the transmission lines from Potrero Hill to Hunters Point to Larking be evaluated in the EIR. He noted that a transmission line from the north was the only good line, an issue that had been raised during an ISO meeting.

Mr. Da Costa noted that the EMF emissions must be evaluated at the Potrero Station in their totality to ensure minimum emission of particulates from sources that were existing and whatever new sources were planned in the future. He asked for an evaluation on a regional basis to ensure that the best transmission would be provided. He added that within the City and County of San Francisco much money was being spent on transmission lines and the environment was being upset by combustion turbines.

While he acknowledged that the project had nothing to do with the transmission lines, Mr. Da Costa stated that there would be particulates and a cooling system that would discharge back into the environment. He questioned who would manage the combustion turbines.

Mr. Da Costa also commented that the City of San Francisco had an approximate

population of 780,000 people, although during the daytime the population increased. He emphasized that the area of southeast San Francisco had an increased population due to industrial workers in the area. He suggested that the impacts to those workers should be evaluated. He emphasized that the area was rich in cultural resources which should also be considered. He hoped to provide more comments in writing in the future.

DR. AHIMSA SUMCHAI, Health and Environmental Science Editor, Bayview Newspaper, explained that she had pre-school immunizations in the neighborhood Potrero House and had the opportunity to express her concerns with the San Francisco Board of Supervisors, Department of Environment and Port Authority when the project had been presented in October. She expressed concern with the additive and cumulative impacts associated with the project and with governmental oversight. She questioned the legality, authenticity and creditability of the project being presented to San Francisco without any City of San Francisco representatives. She also questioned the issue of cost sharing and revenues anticipated by the project which had also not been addressed with the City and County of San Francisco.

Dr. Sumchai spoke to the land use considerations with the San Francisco converter station. She suggested that those considerations by definition on property owned by San Francisco should be made with input from the San Francisco Planning Commission and the Board of Supervisors. She sought appropriate City oversight. As to the possibility of having a converter station in the northern part of the City, she commented that the amount of generated electricity at 400 megawatts of power would be enough to light approximately 300,000 homes, one third of the City's demand. She noted that arguments have been made that a northern position would best meet San Francisco's needs during its peak demands.

Dr. Sumchai questioned the City of Pittsburg's expertise to legally define additive and cumulative impacts related to noise and the EMF emissions, impacts from the current changing from AC to DC and the on-site storage of hazardous materials and chemicals at the converter station, as well as the impacts to the southeast area. She questioned the City of Pittsburg's ability to define those impacts and questioned whether or not Pittsburg had the ability, insight, background and resources to gauge the cumulative impacts including the aging power plants, numerous industries and the like.

Dr. Sumchai asked that the City and County of San Francisco provide input on those issues. She was also concerned with the impact on marine life with the disruption of marine sediment with the laying of the cable. She disagreed that there would be no impacts to marine life associated with the installation of the cable.

GEORGE GUENTHER, Potrero Boosters, 875 Vermont Street, #201, San Francisco,

questioned in the event the project was approved how soon it would allow the closure of the two antiquated plants in the community which were causing so many health problems and social injustice.

DAVE PARQUET, Babcock and Brown, explained that they had spent over a year in the ISO process on the project strategy. Once the Jefferson & Martin station was up and running the ISO would remove the RMR contract for Hunter's Point. PG&E had also agreed that once the RMR contract was removed the plant would be shut down. If and when the CTs were installed, the ISO by its Action Plan, would take away the RMR contract for the Potrero Power Plant.

Mr. Parquet stated it was up to Mirant to turn that plant off. If the project was implemented it would serve the load to 2010 or 2011 and a long term solution would be needed to keep the lights on. In the evaluation of the alternatives, he stated that the project was the determined strategy for the long term. He clarified that the applicant, Babcock and Brown, was not directly responsible for the shut down of the power plants. The plan the ISO had in place should shut down some of the plants. As a result, something was needed to serve the long term.

Mr. Parquet added that the Draft EIR (DEIR) would be out in January and the Final EIR (FEIR) would be out in April/May 2006 with certification in June 2006. If the process occurred as anticipated, there would be a period of three months for all agencies including the City and County of San Francisco to act on discretionary acts and permits and possibly have permits and development activities by October 2006. He stated it would take 27 months to initiate and implement things with an operation expected around January 2009.

ESPANOLA JACKSON, San Francisco, supported the cable project and inquired when it was completed if the City of San Francisco would still need the CTs, which she opposed. She questioned whether or not the project would provide enough electricity where the CTs would not be necessary.

Mr. Parquet stated that the CTs would be under the control of the City of San Francisco. In his opinion, there would be less expensive more efficient power in the grid accessible through all of the other substations interconnected with the City of Pittsburg and it would be less expensive to provide power from Pittsburg than in San Francisco.

Ms. Jackson noted that the CTs were set on empty land and when the last earthquake occurred the CTs could have fallen into the Bay. She questioned the need to go through that expense when it was not needed.

BRIAN WEST, Sierra Club, Energy Subcommittee, 2nd Street, San Francisco, questioned whether or not an EIR would be prepared to quantify the reduction in energy

savings in San Francisco for the installation of the line, and whether or not the savings would allow the elimination of power plants in San Francisco.

DICK MILLET, Potrero Boosters, 250 Connecticut Street, #5, San Francisco, understood that the Pittsburg converter site was 11.5 acres in size. He inquired of the size of the San Francisco site.

Mr. Jerome noted that the San Francisco site was six acres.

Mr. Millet questioned why the project was not going on the Mirant property or the current power plant property, which were getting larger rather than smaller in area. He questioned whether or not Mirant was involved in the project, who owned the proposed project, what discharge would be in the water, air, or dumped into the ground, and whether or not any of the materials would be toxic.

Mr. Parquet explained that Mirant had no participation in the proposed cable project. As to the location of the converter station on the Mirant power plant site, he advised that three alternative sites were being considered; the Mirant power plant site, south of the HWC site, and most recently the City of San Francisco had asked for consideration of the Western Pacific site. The Trans Bay Cable project would be owned by the City of Pittsburg at the end, with Babcock and Brown to own the transmission rights to be turned over to the ISO which would have control of all transmission in the State and which would control the project.

Mr. Jerome stated that Babcock and Brown, as the applicant, would be required to secure the site which was not controlled by the City of Pittsburg or San Francisco. It would also be the responsibility of the applicant to negotiate and acquire the properties.

Mr. Millet inquired of the background of Babcock and Brown, to which Mr. Parquet reported that Babcock and Brown's website included detailed information on the firm.

Dr. Sumchai added that she had met with the Policy Committee of the Department of Environment which would like input in the drafting of the EIR. She expressed her hope that the applicants would be in contact with that agency. She again spoke to cumulative impacts and the warming effects and noted that the global warming effects in the Gulf region of the country had added to catastrophes. She suggested that accumulating electrical projects in a region, as proposed, would create a more significant local warming effect. She suggested that the warming effect should be evaluated as to the impacts to Bay water, currents and human activities.

An unidentified individual commented that the tidal flows in San Francisco Bay prevented the situations that had occurred in the Gulf region.

Dr. Sumchai reiterated her concern with the cumulative effect and the impacts on global warming.

JOE BOSS, DOGPATH, 934 Minnesota, San Francisco, inquired whether or not the opinion on the CTs was the opinion of Babcock and Brown and the City of Pittsburg. He also understood that the EIR would also consider three alternate locations, as earlier identified.

Mr. Jerome understood that the Western Pacific site had been requested by the City of San Francisco to be included in the evaluation, although that could not be done since they could not get control of that site and there were practical reasons why it could not be used as a site.

Mr. Parquet suggested that the comments he had made on the CTs was supported by the information. He noted that the system would have more efficient resources with the CT's to operate less when the cable had been installed as proposed.

Mr. Boss inquired if there would be less need for the CTs when the DC line was in place. Based on the applicant's opinion, he understood that the CTs were not necessary.

NORMAN ROLFE, San Francisco, commented that there were other cables under the Bay, including telephone cables to Treasure Island. He assumed that the work on the project would be coordinated with those existing companies, to which Mr. Jerome affirmed that those issues would be evaluated in the process.

Ms. Jackson suggested that the CTs were not needed if the City of San Francisco had enough power to serve the community. She questioned the discussion of the CTs with nothing being done. She emphasized that the community needed less expensive services. She also emphasized that the CTs had produced negative health impacts, such as cancer, in the Hunter's Point and Bayview districts.

DAVID BEAUPRE, Port of San Francisco, Pier 1, San Francisco, suggested that projects that would contribute to the quality of life issues for a small area should be discontinued to allow projects that would benefit a wider region. He noted that San Francisco had many agencies involved with the issues surrounding the CTs including citizen's advocate and environmental groups. The San Francisco Port Authority had not been mentioned in the process. He recommended that the DEIR be provided to all agencies to ensure that everything was being made public to all involved.

Mr. Beaupre recommended a website with all associated information that could be accessible to the general public. He sought fewer particulates in the atmosphere and

fewer discharges into the water in the near future.

An unidentified individual questioned how the converter system would operate, whether or not it would create heat, what cooling system would be used and how many BTUs would be generated and over what surface area.

LINDSDAY MARTIN, representing Siemens, the manufacturer of the converter technology, explained that there would be no moving parts in the converters and the power electronics would have a large scale with no moving parts. There would be some cooling that was needed through a closed loop system with no discharge into the system and no water being received or discharged into the Bay. The system would be located in the building itself. Once full it would be operational and would involve a water based cooler that would put out some heat but which would have no intake or generate hot water discharge or particulates. The exact design of the equipment was still in the design stage.

CLOSING REMARKS

Mr. Jerome thanked everyone for attending the meeting and for providing comments. He reiterated that the scoping session would be used in the preparation of the DEIR, that all involved agencies had been noticed of the EIR with a solicitation of comments, and that the public comments would be utilized and analyzed by the consultants. The DEIR would be produced around January/February 2006 and would then be published for public review and the preparation of the Final EIR (FEIR) by the end of May 2006.

Comments would continue to be solicited from the public and various agencies on the DEIR with responses to those comments, in writing, in the FEIR.

Mr. Jerome added that those who had signed the sign-in sheet would be informed when the DEIR was ready to be circulated with requested copies provided. Per CEQA, the DEIR had a review period of 45 days whereby anyone had a 45 day period to ask any questions or provide any comments. Responses to all verbal comments, including written comments to be sent to Lamphier-Gregory, would comprise the FEIR.

As the lead agency, the City of Pittsburg would certify the FEIR. Once the FEIR had been completed, the City of Pittsburg and other agencies would use that document to make a decision on any permits that would be required for the project.

ADJOURNMENT

There being no further business, the meeting adjourned at 8:17 P.M.

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
333 MARKET ST.
SAN FRANCISCO, CALIFORNIA 94105-2197

REPLY TO
ATTENTION OF

December 8, 2005

Engineering and Technical Services Division

Ms. Joan Lamphier, Principal
Lamphier-Gregory
1944 Embarcadero
Oakland, CA 94606

RE: Trans Bay Electrical Cable Project

Dear Ms. Lamphier,

The U.S. Army Corps of Engineers (USACE) has received notice that you are soliciting input on the preparation of the Environmental Impact Report for the City of Pittsburg's proposed Trans Bay Cable Project. USACE requests that the EIR process consider the potential for interference of the Trans Bay Cable Project with ongoing operation and maintenance and potential future deepening of navigation channels and harbors in the San Francisco Bay and Delta. USACE is concerned that the Trans Bay Cable Project may obstruct dredging operations and maintenance of the following Corps projects:

- Oakland Harbor
- Richmond Harbor
- San Pablo Bay/Mare Island Strait
- Suisun Bay Channel
- Suisun Channel
- San Francisco Bay Drift Removal

USACE is also concerned that the proposed Trans Bay Cable Project may affect future deepening of navigation channels from San Francisco to Stockton. A channel deepening feasibility study between these locations is currently underway.

USACE requests that the project design and EIR consider potential interference between the Trans Bay Cable Project and ongoing and future USACE navigation projects. Additionally, we request that you consult with the following ports and independent marine terminal operators that may be affected by the proposed project.

- Pittsburg/Antioch Terminals
- Richmond Chevron Long Wharf
- Avon/Martinez Terminal
- Port of Benicia
- Amorco
- Port of Richmond
- Rodeo Facility

- Valero Benicia
- Concord Naval Weapons Station
- Defense Fuels Support Point Ozol
- Port of Oakland

We look forward to working with you during the project design and EIR process to ensure that the Trans Bay Cable Project is safe and successfully designed.

Sincerely,

John H. Jacobson, P.E.
Chief, Engineering and
Technical Services Division

Enclosure

This appendix presents the following three documents that represent the official position of the CAISO regarding the Trans Bay Cable Project:

- Board of Governors, Approval of the Trans Bay HVDC Cable Project, September 8, 2005
- Approval Presentation to the California ISO Board of Governors, September 8, 2005
- Memorandum to the ISO Board of Governors from Gary DeShazo, September 2, 2005

For additional background information reference the "San Francisco Peninsula Phase 2 Long-term Electric Transmission Planning Technical Study Final Report," Nov. 14, 2005, on the web at http://www.caiso.com/14cd/14cd7bd415cb0.pdf.

Board of Governors 9/8/2005 **Approval of the Trans Bay HVDC Cable Project**

Moved, that the Board of Governors, Approves the Trans Bay Cable Project (the "Project") as the preferred long-term transmission alternative (without regard for routing) to address the identified reliability concerns in northern San Mateo County and San Francisco beginning in 2012 and supports the early implementation of the project for operation by 2009 provided, however, that this approval shall be subject to change or withdrawal by the ISO so that other projects may be considered as alternative preferred options to address the identified reliability concerns, in the event that all necessary permits and state easements have not been received for construction of the Project by April 2007.

Moved: Lowe Second: Cazalet

Board Action: **Passed** Vote Count: **5-0-0**	
Cazalet	Y
Gage	Y
Lowe	Y
Willrich	Y
Wiseman	Y

Motion Number: <number>

CALIFORNIA ISO

California Independent
System Operator

Approval of the Trans Bay HVDC Cable Project

Presentation To the
California ISO Board of Governors

September 8, 2005

Gary L. DeShazo
Director of Regional Transmission North

Setting the Stage

A *Project Is Needed For Reliability*

- Reliability planning standard violations that are expected to occur in San Francisco and Northern San Mateo County by 2012
  - Continued reliance on existing import lines
  - Load forecast error
- Continued reliance on special protection schemes (SPS) to meet WECC operating practices
  - Firm load armed to trip
  - Maintenance clearances will be tougher to schedule
- Locational Capacity Requirements in San Francisco
  - San Francisco Action Plan – a difficult balance between local generation retirements and increased stress on import lines
  - Locational capacity shortfall – approximately 100 MW load at risk, will increase as load grows

Using the Stakeholder Process

- San Francisco Stakeholder Study Group (SFSSG)
  - Organized by the CAISO after the 1998 San Francisco disturbance
  - Successful process
    - Jefferson – Martin Project
    - San Francisco Action Plan
- Long-term Phase 2 Study
  - What is after the implementation of the Action Plan
  - Establish a long-term transmission plan for the San Francisco Peninsula Area
- SFSSG Activities
  - Long-term Phase 2 Study initiated in February 2004
  - Study objective and transmission alternatives established
    - Trans Bay Cable Project presented to group in February 2004
    - ISO Tariff allows any Market Participant to propose a project
  - PG&E performed technical analysis and provided preliminary cost estimates

Alternatives Considered

- Status Quo
  - Do nothing
- Upgrade and Replace Existing Facilities - $114M
  - Employ replacing, reconductoring, re-rating, and operating solutions
- Trans Bay Cable Project - $300M
  - New 400 MW HVDC submarine cable between Pittsburg and Potrero substations
- Moraga – Potrero 230kV Line - $274M
  - New 230kV AC line between Moraga and Potrero substations
- Tesla – Potrero 230kV Line - $457M
  - New 230kV AC line between Tesla and Potrero substations

The Approach To Resolution

- SFSSG Objective
  - Address reliability problems
  - Establish long-term transmission solution
- Transmission Alternatives
  - Do nothing
  - Build from the south
  - Build from across the San Francisco Bay
- Decision Drivers
  - Satisfies reliability criteria and meets long-term objective
  - Operational constraints, system losses
  - Security and diversity of power supply
  - Import capability
  - Siting, Timing, and Cost
  - Is there a "real" project or just an alternative

Not From the South!

- Tesla – Potrero 230kV alternative
  - Builds new transmission in parallel with the Jefferson-Martin Project
  - Cost
- Upgrade and replace existing facilities
  - Lower cost by deferring major transmission investment
  - Timing
  - Same transmission path, no diversity of source
  - Clearances required to perform work places firm load at risk
  - Operational constraints
    - Special protection schemes
    - Maintenance and emergency conditions
  - Increased system losses
  - Will not offset locational capacity requirement

Across the Bay Is the Best Approach

- Across the Bay alternatives assessed by the SFSSG
  - Trans Bay Cable Project
  - Moraga – Potrero 230kV alternative
- Moraga – Potrero 230kV alternative
  - Satisfies some of the decision drivers
  - Timing – five to six years to be in-service
  - Requires siting through the City of Oakland
  - No siting work done
  - No compelling technical reason to build from Moraga over building from Pittsburg
  - There was no project proponent during SFSSG assessment

Trans Bay Cable Project Is Preferred

- Satisfies most of the decision drivers
- On line 1st quarter of 2009
- Project proposed to SFSSG in February 2004 as an alternative
- Under development for over 18 months
- Well defined cost estimate and schedule
- Preliminary siting work complete; permits expected 4th quarter of 2006
- Preliminary FERC approval for underlying rate principles has been acquired

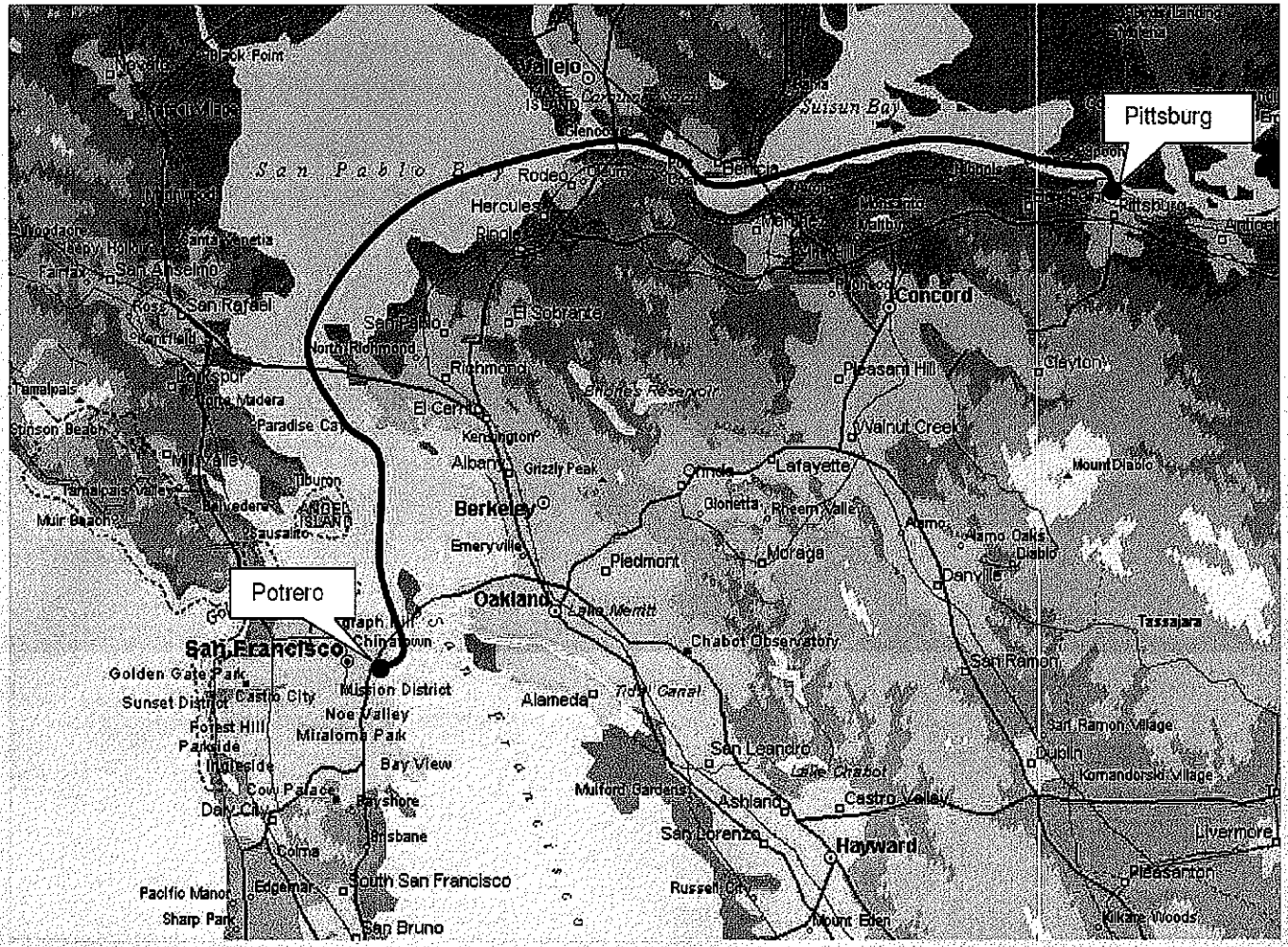
ISO Cost Assessment

- Project proposed to be in-service three years before identified reliability "need" date
- Economic benefits exist over this three year advancement
- The cost of the three year advancement will exceed the benefits from the advancement by $26M
- This net cost is considered an Assurance Cost against intangible benefits
  - Immediate increased reliability to the San Francisco Peninsula Area
  - Reductions in SPS requirements
  - Unforeseen load forecast errors
  - RMR/Locational capacity impacts
  - Consideration of unknowns such as project siting, schedule, cost risks and future economic benefits

Trans Bay Cable Project Background

- A new 59 mile, 400 MW High Voltage Direct Current (HVDC) submarine cable that runs underneath the San Francisco Bay between substations in Pittsburg and Potrero
  - Siemens and Pirelli will construct the Project
- Proposed by an independent developer (Babcock & Brown) in collaboration with the City of Pittsburg
- City of Pittsburg will own the Project
  - Apply to become a Participating Transmission Owner
  - Turn over operational control to the ISO
- In-service date is 2009
- Project cost is estimated to be $300M

Trans Bay Cable Project – Submarine Cable Route



Memorandum

To: ISO Board of Governors

From: Gary L. DeShazo, Director of Regional Transmission

cc: ISO Officers; Board Assistants

Date: September 2, 2005

Re: Approval of the Trans Bay HVDC Cable Project

This memorandum requires Board action.

EXECUTIVE SUMMARY

ISO Management has determined that the Trans Bay Cable Project (Project) is needed to ensure reliable operation of the transmission system within the San Francisco Peninsula Area and is requesting the ISO Board of Governor's approval of the Project as a necessary addition to the ISO Controlled Grid. From among several alternatives, this is the preferred alternative recommended by ISO Management. With approval, the cost of the project would be eligible for recovery as part of the Project Proponent[s] Participating Transmission Owners Transmission Revenue Requirement (TRR) through the ISO High Voltage Access Charge, although the level of costs to be recovered and cost allocation issues would be subject to further proceedings before the Federal Energy Regulatory Commission (FERC).

Babcock and Brown, in collaboration with the City of Pittsburg, is developing the Project. The City of Pittsburg municipal utility will eventually own the Project and will, in turn, apply to become a Participating Transmission Owner (PTO) as defined in the ISO's Tariff and will turn over Operational Control of the Project to the ISO in accordance with the Transmission Control Agreement. In general, the Project consists of a 400 MW High Voltage Direct Current ("HVDC") transmission system that is 59 miles long with its route running under San Francisco Bay from Pittsburg to a location adjacent to Potrero substation in San Francisco. There are associated substation modifications that are necessary to interconnect the Project to the ISO Controlled Grid, but they are not detailed in this memo. Overall, the total cost of the Project, including interconnection to the ISO Controlled Grid, is estimated to be $300 million and is proposed to be in-service by 2009.

This Project is needed for reliability and is being recommended to mitigate violation of reliability planning standards beginning in 2012, but is being recommended for early operation. The Project, as currently structured, is planned to be in-service by 2009. Babcock and Brown has indicated that the financial and contractual arrangements they have with their project partners prohibits delaying the Project's in-service date to 2012 while maintaining the project in its current form and cost. While a reformulation of the Project could theoretically be accomplished, it would require renegotiating numerous contracts for land, equipment, and right-of-way commitments that would result in an increase in the Project's cost. In turn, the ISO performed technical and economic analyses to assess the reliability benefits and the cost to the ISO ratepayers for advancing the in-service date by three years to 2009. ISO's technical analysis concluded that installation of this project in 2009 would significantly improve reliability of the San Francisco Peninsula

electrical system. Existing generation within San Francisco is expected to reduce significantly after implementation of ISO Action Plan in late 2007, which will increase San Francisco Peninsula's Operational Constraints and Locational Capacity Requirements. This Project, with a 2009 in-service date, will significantly reduce expected Locational Capacity Requirements and the need for Special Protection Schemes that are currently in place to shed firm load for critical double contingency disturbances for San Francisco Peninsula. Further, ISO's economic analysis concluded that while the Project does have identified benefits, the present value of the revenue requirements of the benefits and costs over the three-year advancement results in a net cost to the ISO ratepayers of $26 million. This "net cost" is viewed as an assurance cost against intangible benefits such as immediate increased reliability to the San Francisco Peninsula Area, unforeseen load forecast errors and consideration of unknowns such as project siting, schedule, cost risks, and economic benefits. Overall, ISO Management considers this assurance cost acceptable in return for the certainty that the Project will be there when it is needed.

Fulfilling a much broader vision, the Project will also establish a long-term transmission solution for load serving needs within the San Francisco Peninsula Area. Overall, the Project will increase the import capability into the San Francisco Peninsula Area by 400 MW via a route independent of the current routes that feed San Francisco load from the south commensurate with this import capability, this project will decrease overall system losses. The Project has been in development over the past 18 months and due to the long lead time required to build new transmission, is the only alternative evaluated by the San Francisco Stakeholder Study Group (SFSSG) that builds new transmission infrastructure into the ISO Controlled grid that can be in-service in time to address the identified reliability planning standard violations. The Project was initially presented to the SFSSG in February 2004 when the Project proponents requested it be considered, along with the other alternatives, as a long-term transmission solution for the San Francisco Peninsula Area load serving needs.

On August 25, 2005 Pacific Gas and Electric Company (PG&E) and ISO Management met to discuss the ISO's intention to recommend the Project as the preferred transmission alternative. At that meeting, PG&E presented a proposal to reconductor existing facilities as a short-term and construct the Moraga – Potrero 230 kV line as a long-term alternative in-lieu of the Project. PG&E related their concerns on the ability of the Project proponents to successfully site its line that spans almost its entire length of 59 miles underneath the San Francisco Bay. While PG&E recognizes that the Project has completed much of the preliminary environmental work required to construct their project, acquiring the necessary permits to construct the line would likely be more difficult and costly than proposed. Specific concerns are related to disturbing the San Francisco Bay sediment and the contaminants it may contain. Further, because of the line's length, there exists a higher probability of encountering unknown obstructions that could delay and increase the cost of the Project beyond what the Project proponents are projecting. Comparatively, their proposed Moraga – Potrero line would go through the City of Oakland and cross approximately five miles under the San Francisco Bay, which will also result in disturbing the sediment, but to a lesser degree. Because of its shorter length and the opportunity to locate the cable in a "no anchor zone", PG&E believes that they have a higher probability of achieving a successful siting across the Bay in a timely manner. PG&E also recognizes that the line would need to be sited through the City of Oakland and that while it would be challenging, they believe that a successful and timely siting and construction is achievable in as little as five years.

On balance, ISO Management believes that the Trans-Bay Cable proposal is the preferred alternative because it not only provides long-term reliable load serving capability to the San Francisco Peninsula area, it increases the diversity and security of the power supply to this area with implementation risks that are considered commensurate with the Moraga – Potrero alternative. Further, its early availability will reduce this area's operational constraints and expected locational capacity requirements immediately upon its operation.

Management recommends that the Board adopt the following motion:

Moved, that the Board of Governors,

Approves the Trans Bay Cable Project (the "Project") as the preferred long-term transmission alternative (without regard for routing) to address the identified reliability concerns in northern San Mateo County and San Francisco beginning in 2012 and supports the early implementation of the project for operation by 2009 provided, however, that this approval shall be subject to change or withdrawl by the ISO so that other projects may be considered as alternative preferred options to address the identified reliability concerns, in the event that all necessary permits and state easements have not been received for construction of the Project by April 2007.

BACKGROUND

San Francisco Peninsula Area load is served by a combination of in-area generation and power imported into this area over several 230 kV, 115 kV and 60 kV transmission lines. At the present time, two primary generation facilities, Hunters Point and Potrero Power Plants, which together can generate up to 570 megawatts (MW) of power, support the load serving needs of this area. This amount of generation represents approximately 20% of the total load in this area and the balance of the load serving need is delivered through PG&E's transmission system from generation resources outside this area.

In 2004, the ISO closely worked with the City and County of San Francisco (CCSF), PG&E, and interested stakeholders to establish a plan that describes the transmission and generation requirements necessary to reliably serve the San Francisco Peninsula Area load while allowing for the release of all existing generation at Hunters Point and Potrero Power Plants from their Reliability Must-Run (RMR) Agreements. This plan (Attachment 1), called the "Revised Action Plan for San Francisco" (Action Plan) was adopted by the ISO Board of Governors in November 2004 and is currently being implemented by PG&E, the CCSF, and the ISO. Full implementation of the Action Plan is expected by the end of 2007.

THE PROBLEM

Recognizing the need to establish a longer-term transmission plan once the Action Plan was implemented, the ISO, together with the SFSSG, initiated the Long Term Phase 2 (Phase 2) Study to determine the transmission facilities necessary to reliably serve the load in this area through at least 2018. The results of this study indicated that once the Action Plan was fully implemented, it would provide sufficient load serving capability for the San Francisco Peninsula Area through 2011, however, by 2012 reliability planning standard violations would exist in northern San Mateo County and San Francisco. While the ISO Action Plan does achieve the retirement of old generation in San Francisco, it also contributes to increased flows on the transmission facilities that serve the load in the area.

The San Francisco Peninsula Area presently receives all of its imported power from the south through the Peninsula from points as far away as Pittsburg, Contra Costa, Tesla, and Metcalf. Once the ISO Action Plan is fully implemented, this same transmission infrastructure must support an additional 378 MW[1] of San Francisco Peninsula Area load as well as anticipated load growth of approximately 15 to 20 MW per year that is expect to occur in this area. While the increased reliance on this transmission infrastructure was addressed in the ISO Action Plan through various transmission additions, upgrades, and re-rates, the impact on the area's future load serving capability was not assessed beyond 2007 until the Phase 2 study effort was initiated. Due to the long lead times required for building new transmission infrastructure, ISO Staff believes that action to mitigate these limitations must be taken now to assure that the necessary transmission infrastructure is in place by the time the limitations are expected to occur.

Not withstanding the identified reliability planning standard violations that are expected to occur in 2012, there are several operational constraints and locational capacity issues that this area will face once the Action Plan is fully implemented and the existing generation at Hunters Point and Potrero is retired. These issues are discussed below.

Operational Constraints:
Operation of the existing San Francisco Peninsula area's electrical system relies on the use of Special Protection Schemes (SPS) that arm over 540 MW of firm load to trip for critical double contingencies to meet the minimum operating reliability criteria required by the Western Electricity Coordinating Council (WECC). While the Jefferson – Martin 230kV Project (expected to be in-service by early 2006) will decrease the amount of load shedding required to meet expected WECC operating practices, a significant reduction in generation in this area after implementation of the ISO Action Plan will offset this reduction in load shedding. The need for existing SPS will remain and will continue to increase as the load in the area increases.

Locational Capacity Requirements:
The California Public Utilities Commission (CPUC) and California Energy Commission (CEC) have taken the leadership role in ensuring resource adequacy for the State. The CPUC's Resource Adequacy requirements are designed to ensure that load serving entities have procured sufficient resources to meet their load and that these resources are deliverable to their load. A key requirement for ensuring the deliverability of Load Serving Entity resource portfolios is to ensure that there are sufficient generation resources in transmission constrained local load pockets such as the San Francisco Bay Area, the Los Angeles Basin, and San Diego to reliably serve customer demand.

At the request of the CPUC, the ISO performed a technical analysis to determine the local generation capacity requirements within the transmission constrained local areas of the grid. These studies show that after the San Francisco Action Plan is implemented, the San Francisco Peninsula Area's Locational Capacity requirements will exceed the amount of generation expected to be available in this area by approximately 100 MW. Because it is likely that no new generation can be sited in San Francisco, the only alternatives available to meet this additional locational capacity requirement is to either install a new SPS to

[1] Existing generation at Hunters Point Units 1 and 4 (52 MW and 163 MW, respectively) and Potrero Units 3, 4, 5, and 6 (207 MW, 52 MW, 52 MW, 52 MW, respectively) total 578 MW. The proposed four CCSF Peakers will total 195 MW. The ISO Action Plan will allow for the retirement of all generation at Hunters Point and Potrero and the installation of the CCSF Peakers. As a result, there will be a net increase in transmission import requirements of 383 MW.

trip about 100 MW of firm load when required or build new transmission into the San Francisco load area to replace the area's generation deficit.

SAN FRANCISCO STAKEHOLDER STUDY GROUP

On December 8, 1998, PG&E experienced a severe disturbance initiated at San Mateo Substation that resulted in a blackout of most of the City of San Francisco and nearby communities on the San Francisco Peninsula. Subsequent to this incident and following extensive investigation by the ISO and PG&E, a stakeholder group was formed to provide a public forum in which the ISO could assess long-term transmission solutions for reliably serving load in the San Francisco and Peninsula areas. This stakeholder group, called the San Francisco Stakeholder Study Group, included a variety of entities such as the City and County of San Francisco (CCSF), the Pacific Gas & Electric Company (PG&E), the California Public Utility Commission (CPUC), the California Energy Commission (CEC), various generation developers, representatives of local San Francisco community groups, and others. This group played a key role in identifying the Jefferson-Martin 230 kV Line Project as the preferred alternative for addressing San Francisco's long-term load serving concerns as well as developing the Action Plan that will lead to the eventual retirement of all the old generation facilities at Hunters Point and Potrero.

However, considering the long lead time to construct new transmission facilities, the ISO continued to utilize the SFSSG to establish a long-term (ten-year) transmission plan beyond the implementation of the Action Plan. This effort, called the Long Term Phase 2 Study, was initiated by the ISO in February 2004. The SFSSG developed the study objectives as well as the transmission alternatives that were to be studied. To be consistent with the ISO Tariff (Section 3.2.1), the Trans Bay Cable Project was included as one of the alternatives to be considered in the overall study effort. The Project's proponents presented the Trans Bay Cable Project, already in its preliminary development stages, to the SFSSG in February 2004 and requested that it be evaluated along with the other alternatives.

Since its initiation, the SFSSG, as it did with Jefferson – Martin and the Action Plan, has played a valuable role in the assessment of the technical results of all transmission Long Term Phase 2 studies performed by PG&E and the ISO. This technical assessment concluded that there would be reliability planning standard violations that would occur in San Francisco and the Northern San Mateo county areas beginning in 2012. The assessment also concluded that all of the transmission alternatives assessed by the SFSSG, but for the "Status Quo" or "Do Nothing" alternative, could address the identified reliability planning standard violations, provided they could be completed by the time they were needed. The SFSSG also concluded that given the transmission alternatives assessed and given the opportunity to do so, constructing a new transmission line to San Francisco from across the San Francisco Bay would be preferred over alternatives that approached the San Francisco Peninsula Area from the south through the peninsular corridor. The Trans Bay Cable Project and the Moraga – Potrero 230kV line are the only alternatives evaluated by the SFSSG that approach San Francisco from across the San Francisco Bay, as such, these are the only "across the bay" alternatives that were considered in the ISO's analysis of the preferred long-term transmission solutions for the area. In addition, the SFSSG concluded that given the technical analysis results presented, there was no compelling evidence to conclude that constructing a new transmission line from Moraga (Moraga-Potrero alternative) would be technically superior over a new transmission line built from Pittsburg (Trans Bay Cable Project). Given that the Trans Bay Cable Project was the only alternative being proposed as a viable project, the ISO concluded that siting an alternative such as the Moraga – Potrero alternative through the City of Oakland, while not impossible, would likely be difficult to complete in a timely manner. Based on this and other information discussed in this memorandum, the ISO concluded that the Trans Bay Cable Project was preferred over the other alternatives evaluated by the SFSSG.

Because the Trans Bay Cable Project is proposing an early in-service date (early 2009), the ISO also undertook an analysis of the cost impact to the ISO ratepayers of advancing the in-service date ahead of the reliability need date by three years (2012 to 2009). The ISO's cost analysis is discussed in more detail later in this memo, however, the results did indicate that while the Trans Bay Cable Project does bring economic benefits to the area, the overall costs of advancement would exceed the identified benefits, as calculated by the ISO. While the results of the ISO's cost analysis was presented to and discussed within the SFSSG, there was no clear consensus among all of the stakeholders on the conclusions that should be drawn from the ISO's results other than some stakeholders suggesting a final decision should be postponed to allow for further analysis to be completed.

DIFFERENT APPROACHES TO THE SOLUTION

As discussed earlier, the San Francisco Peninsula Area presently receives all of its imported power from the 230kV, 115kV, and 60kV transmission facilities which emanates south of San Francisco, through the San Francisco Peninsula corridor, and onward to Pittsburg, Contra Costa, Tesla, and Metcalf Substations. Because of its geographical orientation, load in San Francisco and the adjacent peninsula corridor is considered electrically "radial" to the remaining transmission infrastructure in the overall Greater Bay Area. Once the ISO Action Plan is fully implemented, the CCSF Peakers will be the only generation remaining in the San Francisco area but for a 28 MW combustion turbine located adjacent to the San Francisco International Airport. As such, approximately 90% (~1800 MW) of this area's load will be served by importing power from outside the area. As would be expected, during peak load serving periods, these import lines will be heavily loaded such that the ability to serve the load in this area does become constrained for certain critical single and double contingencies.

Given the geographical location of the load in the San Francisco Peninsula Area and the difficulty in locating new generation resources in this area, new transmission infrastructure and/or additional transmission upgrades are required to either be constructed from the south or from the east across San Francisco Bay. Through the SFSSG, the technical aspects of four transmission alternatives were evaluated to determine their viability for addressing the identified reliability planning standard violations. These alternatives are discussed below.

1. **Status Quo** – This alternative proposes to do nothing beyond utilizing the transmission facilities and generation planned to exist once the Action Plan for San Francisco is fully implemented by the end of 2007.

   Analysis: This alternative does not meet the objective of establishing long-term reliable load serving capability, nor does it meet the reliability Planning Standards.

2. **Upgrade and Replace Existing Facilities** – This alternative proposes to utilize existing transmission infrastructure to support existing and anticipated load growth in the area. When needed, employ replacing, reconductoring, re-rating and operating alternatives to mitigate transmission system overloads and low voltages.

   Analysis: This alternative does not meet the objective of establishing long-term reliable load serving capability. It provides enough load serving capability to serve the San Francisco Peninsula load only up to 2018, beyond which a major new transmission project will be needed in this area. Permitting and building this new transmission in 2018 will be extremely difficult, if not impossible.

All other new transmission alternatives improve this area's load serving capability for a longer duration. This alternative does not improve diversity in supply of power serving the San Francisco load. It relies on increasing the import of power into the San Francisco Peninsula by upgrading existing transmission facilities. San Francisco Peninsula area's Locational Capacity Requirements and its reliance on Special Protection Schemes are expected to increase after full implementation of ISO Action Plan takes place by the end of 2007. This alternative will not reduce this area's operational constraints and will not offset this area's growing locational capacity requirements until 2017, when PG&E's proposed new San Francisco Internal Capacity Project goes in service. To implement this alternative, few key existing transmission facilities need to be removed from service for construction. This coupled with significant reduction in the amount of generation in San Francisco per the ISO Action Plan, can potentially deteriorate the reliability of this area. It is expected that pre-contingency dropping of load in the San Francisco Peninsula area would be necessary to take the clearances that are necessary to perform the construction and that would be a violation of the ISO Planning Standards. The potential capital cost of this alternative through 2018 is estimated at $114 million.

3. **Trans-Bay Cable Project** – This alternative proposes to build a new 400 MW High Voltage Direct Current ("HVDC") submarine DC cable proposed by an independent developer, Babcock & Brown, between PG&E's Pittsburg Substation in the East Bay Area and Potrero Substation in San Francisco for operation by 2009.

   Analysis: This alternative fully meets the objective of establishing long-term reliable load serving capability by adding 400 MW of load serving capability upon its initial operation. This alternative will increase the diversity of transmission routes to San Francisco through installation of controllable transmission capacity from PG&E's Pittsburg Substation in the East Bay to Potrero Substation in San Francisco. It will unload the existing transmission system that serves load in San Francisco and therefore greatly improve the ability to allow transmission facility clearances that are a part of normal day-to-day system operation. This alternative provides for significant savings by reducing power losses within the parallel AC transmission system, deferral of new 115 kV cables within San Francisco as well as facilitates a more economic generation dispatch pattern within the Greater Bay Area. This project is estimated to cost $300 million including Interconnection costs. In addition, there are economic savings associated with the Trans-Bay Cable resulting from transmission system loss savings (capacity and energy) and improved economic dispatch of generation. The ability to permit and build this project in a timely manner requires about half the lead-time (three years) as either the Moraga to Potrero or Tesla to Potrero 230 kV Projects. In addition, development of an Environmental Impact Report is well underway as is filing with the Federal Energy Regulatory Agency for rate recovery.

4. **Moraga-Potrero 230 kV Line** – This alternative proposes to build a new 230 kV AC line from Moraga Substation in the East Bay area to Potrero Substation in San Francisco. This new line would include a combination of overhead or underground facilities from Moraga to the San Francisco Bay and then run beneath San Francisco Bay to Potrero Substation.

   Analysis: While this alternative will provide long-term reliable load serving capability, the ability to successfully permit and construct this project by 2012 is very uncertain. As such, this alternative is not preferred due to its high implementation uncertainty, risks, and costs associated with successful routing and timely permitting. The potential capital cost of this alternative is estimated

at $274 million but could be much higher due to its implementation uncertainties as related to the ability to obtain and permit a route through the congested Oakland area.

5. **Tesla-Potrero 230 kV Line** –This alternative proposed to build a new 230 kV circuit from Tesla Substation to San Ramon Substation, reconnection at San Ramon Substation, reconductoring of 230 kV circuits between San Ramon and East Shore substations, and installing a new 230 kV circuit from East Shore to Potrero substations. The portion of the project between the East Shore and Potrero Substations would include a new line across and above the San Francisco Bay and a new underground cable approximately parallel to the existing San Mateo - Martin 230 kV cable, which would extend to Potrero Substation.

   Analysis: Similar to the Moraga-Potrero alternative, the ability to permit and construct the Tesla-Potrero alternative is highly uncertain. This alternative parallels existing transmission infrastructure through the San Francisco peninsula corridor that already accommodates numerous 115kV and 230kV lines, including the Jefferson – Martin 230kV Transmission Project. This alternative does not provide the diversity and increased security of power supply that is attainable with the Trans-Bay Cable project. Siting another transmission project through this area would be extremely difficult considering the recent siting of the Jefferson – Martin line in this same area. This alternative will also require the construction of a new transmission facility across and above the San Francisco Bay as well as through the eastern boundary of the Bay Area. This alternative is not preferred due to its high implementation uncertainty and risks associated with new construction through the San Francisco peninsula corridor and across the San Francisco Bay. In addition, the potential capital cost of this alternative is estimated at $457 million, which is significantly more than the Trans-Bay Cable Project or Moraga to Potrero 230 kV Project. Due to the significant increase in capital cost of this alternative over the other alternatives considered, an economic assessment was not performed.

ISO ECONOMIC ANALYSIS OF THE PREFERRED ALTERNATIVE

As discussed in the previous section, the transmission alternatives are designed to satisfy an important San Francisco planning need that is forecasted to start in 2012. The long-term alternatives considered were therefore primarily evaluated from a reliability perspective (i.e. the least-cost alternative that satisfies the reliability need, subject to other considerations such as project risk). The least-cost alternative is determined by considering the projected capital and operating costs, as well as any difference in economic benefits provided by the individual alternatives. Evaluation of the least-cost alternative is the approach used in this economic analysis. ISO staff recognizes that the least-cost analysis is only one of many critical decision criteria that are considered when recommending a transmission project.

ISO staff views the determination of the long-term preferred alternative, and the recommended timing of this preferred alternative, as two separate considerations for supporting the selection of the preferred transmission alternative. ISO staff developed economic data and analyses to assist in assessing these considerations. The economic results are summarized in this section.

Recommended Long-Term Transmission Solution

Three long-term alternatives were evaluated from an economic perspective. These alternatives include the Trans-Bay Cable Project, the Moraga-Potrero line, and the Tesla-Potrero line.

The economic benefits of the Tesla-Potrero alternative were less than the other two alternatives evaluated. Also, the Tesla-Potrero capital costs were almost 50 percent higher than the other two alternatives. Given this significant cost differential and the other issues associated with this alternative and stated within this memorandum, no further economic evaluation was made for this alternative.

The remaining two long-term alternatives (Trans-Bay Cable and Moraga-Potrero) considered are more closely related in economic benefits and capital costs. Both options can provide up to 400 MW of new capacity to the San Francisco Peninsula from East Bay generation. The Trans-Bay Cable, however, is projected to result in lower system losses than the Moraga-Potrero option, since the DC line itself is expected to have lower losses than an AC alternative. The capital costs of the two alternatives are within 2 percent of each other and based on the accuracy of their estimated cost, are deemed to be equivalent for purposes of this analysis. As a result of the projected lower system losses and other issues identified in this memorandum, the Trans-Bay Cable Project was preferred over the other alternatives.

Recommended Timing of Preferred Alternative

Because the Trans Bay Cable Project is proposing an early in-service date (early 2009), the ISO also undertook an analysis of the cost impact to the ISO ratepayers of advancing the in-service date ahead of the reliability need date by three years (2012 to 2009). Once the preferred long-term solution has been identified, the remaining question is whether the online date of the Trans Bay Cable Project should be planned for 2012 or brought online earlier. The primary criteria for this decision for a reliability project are likely to be based on reduced risk of loss of load and other considerations by bringing the project on-line earlier than needed. However, there is also an economic impact of an earlier on-line date that should be considered.

Capital projects are often compared on the basis of the present value of revenue requirements (PVRR). As shown in Table 1, the PVRR increases $63 million if the Trans Bay Cable Project is brought online in 2009 versus 2012. However, the earlier online date provides some distinct benefits including increased reliability to San Francisco, reduction of project schedule and cost risk, and economic benefits. The economic benefits are estimated to be about $14 million per year. The present value of 3 years of economic benefits is approximately $37 million. Thus, the net cost of bring the project online by 2009 as compared to 2012 is $26 million.

This net cost can be viewed as a 6.2 percent Assurance Cost against intangible benefits such as reductions in SPS requirements, unforeseen load forecast errors, Reliability Must-Run/Locational Capacity requirements, reduced project siting costs, schedule, and cost risks (as well as increased San Francisco reliability for the three years. From ISO Management's perspective, this 6% Assurance Cost is considered a prudent investment given the intangible benefits mentioned above and the certainty that the Project will be there when it is needed. Based on these considerations, ISO staff believes the Trans Cable Project's early in-service date is warranted.

Table 1
Economic Comparison of a 2009 or 2012 Trans Bay Cable Online Date

PV of revenue requirements	$483	$420	$63
PV of 2009-2011 economic benefits	$37	$0	$37
NPV of revenue requirements	$446	$420	$26
Revenue requirement risk premium			**6.2%**

FERC PROCEEDING

Trans Bay Cable LLC (TBC - a wholly-owned subsidiary of Babcock & Brown LP) in conjunction with the City of Pittsburg and Pittsburg Power are proposing the Trans Bay Cable Project (the Project) and filed for rate recovery with FERC on May 19, 2005. On July 21, 2005, FERC issued it's preliminary approval of the rate principles for the Project that is estimated to cost $300 million and bring 400 MW of additional capacity to serve load in the San Francisco Area.

The rate principles accepted by FERC include:

- A 13.5 percent return on equity;
- A three-year rate moratorium from initial transmission revenue requirement;
- A 50/50 debt-equity capital structure; and
- A 30-year depreciation period.

In approving the rate principles, FERC cited the potential for reduced congestion costs and reliability-must-run requirements in San Francisco as well as reducing the need for additional generation in San Francisco. Overall, FERC found that based on enhanced reliability, more efficient generation dispatch and potential environmental benefits, the Project will be beneficial.

TBC is the present sole owner of the Project through project development, permitting and construction phases. The Project will be designed and built by Siemens and Perelli. The City of Pittsburg and Pittsburg Power are expected to exercise an alternative to acquire the Project upon its operation. The City of Pittsburg and Pittsburg Power would, in turn, become a Participating Transmission Owner (PTO) as defined in the ISO's Tariff and will turn over the Operational Control of the Project to the ISO in accordance with the Transmission Control Agreement. The project operation will be coordinated with the existing transmission system and operated in accordance with prudent utility practice as a transmission facility within the ISO's Control Area.

Figure 1
Trans Bay Cable Project – Submarine Cable Route

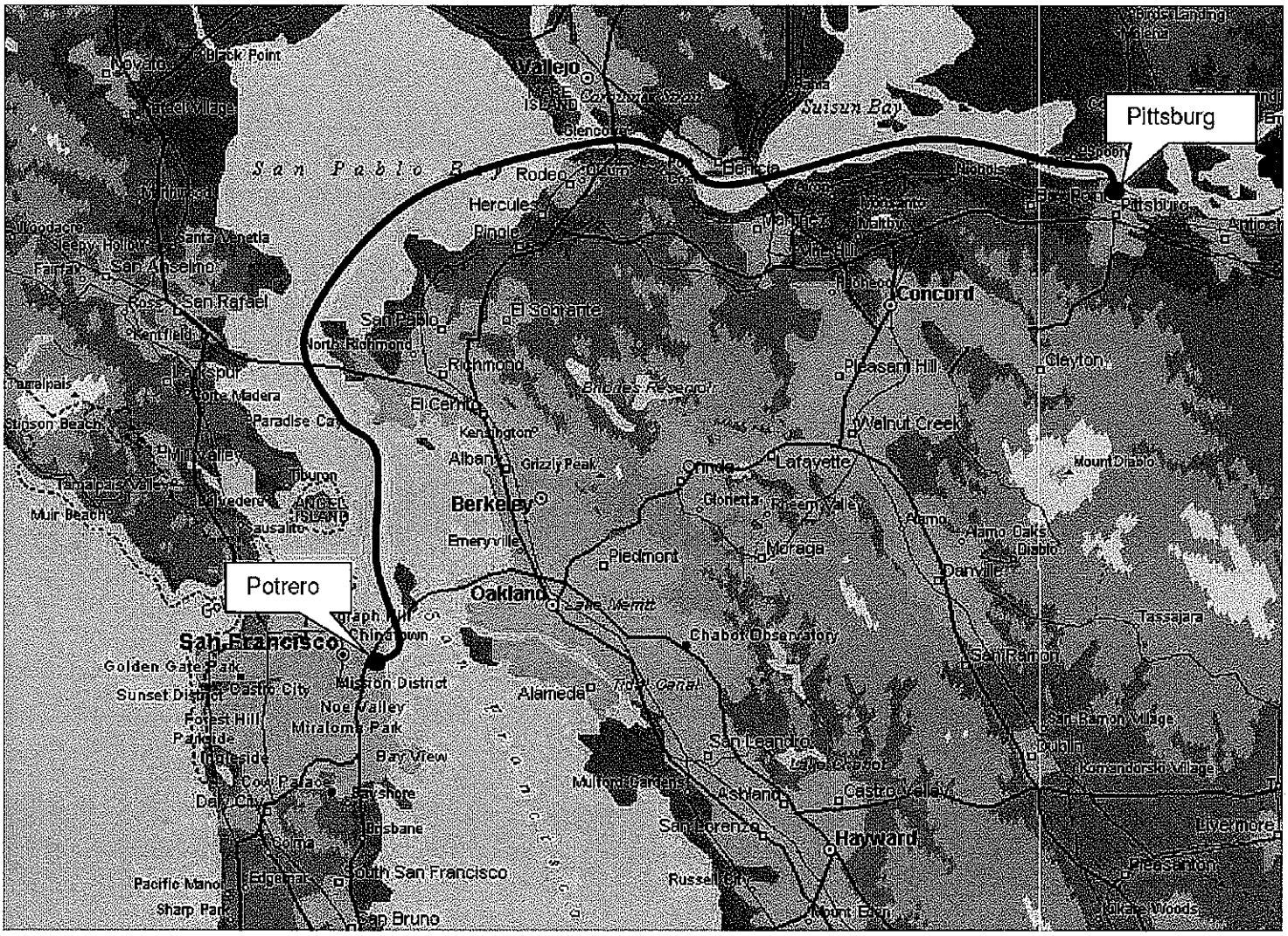
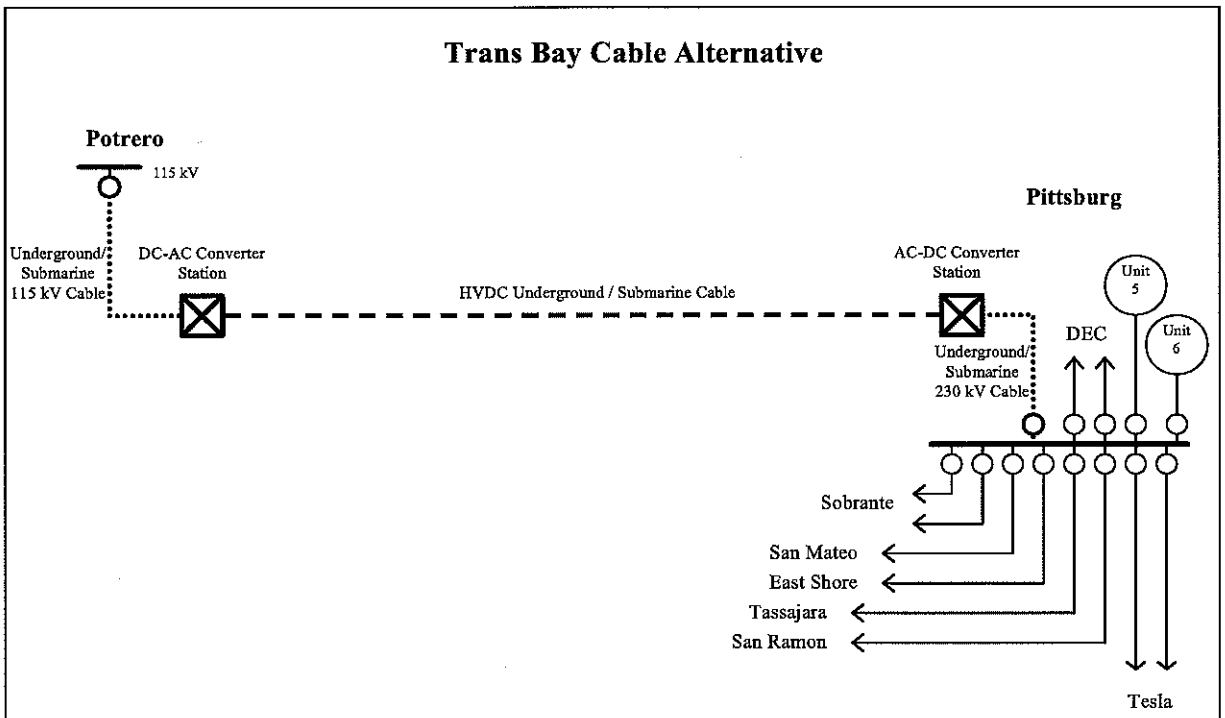

Pittsburg
Potrero
San Francisco
Oakland
Berkeley
Vallejo
Concord
Richmond
Hayward
San Pablo Bay
Suisun Bay
Carquinez Strait
Benicia
Martinez
Pittsburg
Antioch
Pacheco
Clyde
Port Chicago
Bay Point
Nichols
Bethel Island
Oakley
Brentwood
Byron
Discovery Bay
Knightsen
Delta De Haro Island
Sherman Island
Jersey Island
Rio Vista
Isleton
Walnut Creek
Pleasant Hill
Clayton
Mount Diablo
Lafayette
Orinda
Moraga
Danville
Alamo
Alamo Oaks
Diablo
San Ramon
Tassajara
Dublin
San Ramon Village
Livermore
Pleasanton
Sunol
Castro Valley
San Lorenzo
Ashland
Cherryland
Hayward
Russell City
Mount Eden
Fairview
Kilkare Woods
Alameda
Bay Farm Island
Oakland Inner Harbor
Oakland Outer Harbor
Chabot Observatory
Lake Merritt
Piedmont
Emeryville
Albany
Grizzly Peak
Berkeley
Glorietta
Rheem Valley
Kensington
El Cerrito
Richmond
North Richmond
San Pablo
El Sobrante
Pinole
Hercules
Rodeo
Crockett
Port Costa
Martinez
Mallard Island
Ryer Island
Grizzly Island
Suisun Slough
Suisun Marsh
Fairfield
Vacaville
Travis AFB
Dixon
Winters
Davis
Woodland
Esparto
Madison
Capay
Knights Landing
Maine Prairie
Elmira
Vacaville
Vanden
Allendale
Cordelia
Green Valley
Suisun City
Fairfield
Benicia
Vallejo
Mare Island
Napa
Yountville
Oakville
Rutherford
St Helena
Calistoga
Angwin
Pope Valley
Lower Lake
Middletown
Hidden Valley Lake
Kelseyville
Clearlake Oaks
Clearlake
Lakeport
Upper Lake
Nice
Lucerne
Clearlake Park
Cobb
Loch Lomond
Spring Valley
Hidden Valley
Lake Pillsbury
Lake Berryessa
Monticello Dam
Putah Creek
Cache Creek
Capay Valley
Guinda
Rumsey
Brooks
Knoxville
Lower Lake
Middletown
Hidden Valley Lake
Kelseyville
Clearlake Oaks
Clearlake
Lakeport
Upper Lake
Nice
Lucerne
Clearlake Park
Cobb
Loch Lomond
Spring Valley
Hidden Valley
Lake Pillsbury
Lake Berryessa
Monticello Dam
Putah Creek
Cache Creek
Capay Valley
Guinda
Rumsey
Brooks
Knoxville
Napa
Yountville
Oakville
Rutherford
St Helena
Calistoga
Angwin
Pope Valley

Figure 2



An independent developer (Babcock & Brown) would permit and build a new 400 MW High Voltage Direct Current (HVDC) submarine cable between Pittsburg Substation in the East Bay area and Potrero Substation in San Francisco.

Attachment 1

ISO Revised Action Plan for San Francisco

This action plan was originally presented to the ISO Board of Governors in November 2004 and has been updated to reflect the current status of the identified projects

ISO Revised Action Plan for San Francisco

PG&E Transmission Projects and City Peaking Power Plants Necessary
to Meet NERC/WECC/ISO Planning Requirements

	Project	Estimated Completion Date/Status	Issue	Resolution of Issue
Release Hunters Point Units 2 & 3 From Their RMR Agreements				
1	Potrero Static VAR Compensator	December 2004, Completed	NERC/WECC/ISO Planning Standards	This project allowed /PG&E to meet planning requirements with Hunters Point Power Plant Units 2 and 3 released from their RMR Agreement
Release Hunters Point Units 1 & 4 From Their RMR Agreements				
2	San Mateo-Martin No. 4 Line Voltage Conversion	Completed	NERC/WECC/ISO Planning Standards	This project in combination with the other listed projects allows /PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
3	Ravenswood 2nd 230/115 kV Transformer Project	Completed	NERC/WECC/ISO Planning Standards	This project in combination with the other listed projects allows /PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
4	San Francisco Internal Cable Higher Emergency Ratings	Completed: To Be Used Upon Completion of the Jefferson-Martin 230 kV Project	NERC/WECC/ISO Planning Standards	These ratings are an interim solution that in combination with the other listed projects allows PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreements. In 2007, a third Martin-Hunters Point 115 kV cable will replace the emergency ratings.
5	Tesla-Newark No. 2 230 kV Line Reconductoring	May 2005, Completed	RMR Criteria	This project in combination with the other listed projects allows /PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
6	Ravenswood-Ames 115 kV Lines Reinforcement	May 2005, Completed	RMR Criteria	This project in combination with the other listed projects allows /PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
7	San Mateo 230 kV Bus Insulator Replacement	May 2005 Completion	Operations Requirement During San Mateo Bus Wash	Eliminate bus wash at San Mateo 230 kV bus will reduce the 400 MW generation operational requirement down to less than 200 MW

8	Potrero-Hunters Point (AP-1) 115 kV Cable	December 2005 CPUC Permit Approval Granted	NERC/WECC/ISO Planning Standards	This project in combination with the other listed projects allows /PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement. Scheduled for Dec. 2005 operation.
9	Jefferson-Martin 230 kV Line	December 2005 to March 2006 Under construction	NERC/WECC/ISO Planning Standards	This project in combination with the other listed projects allows /PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
10	Potrero 3 SCR retrofit	June 2005 Completed	NERC/WECC/ISO Planning Standards	This project ensures the availability of Potrero 3 at full capacity thereby reducing overall Greater Bay Area RMR requirements. This project or the reduced capacity available without the retrofit in combination with the other listed projects allows /PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreements
Release Potrero Unit 3 From Its RMR Agreement				
11	San Francisco Electric Reliability Project and San Francisco Airport Electric Reliability Plant	December 2006 or later	NERC/WECC/ISO Planning Standards	These projects will allow /PG&E to meet planning requirements with Potrero 3 released from its RMR Agreement. CEC permit suspended due to a change in where to site near Potrero.
Release Potrero Units 4, 5, & 6 From Their RMR Agreements (assumes previous completion of Peaking Power Plants by the City)				
12	Upgrade the Newark-Dumbarton 115 kV line	May 2006 Engineering in Progress	NERC/WECC/ISO Planning Standards	This upgrade is needed in combination with the other listed mitigations to allow /PG&E to meet planning requirements with Potrero Units 4, 5, and 6 released from their RMR Agreement
13	Upgrade the Bair-Belmont 115 kV Line	Scheduled for May 2007	NERC/WECC/ISO Planning Standards	This upgrade is needed in combination with the other listed mitigations to allow /PG&E to meet planning requirements with Potrero Units 4, 5, and 6 released from their RMR Agreement
14	Upgrade the Metcalf-Hicks & Metcalf-Vasona 230 kV lines	Scheduled for May 2007	NERC/WECC/ISO Planning Standards	This upgrade is needed in combination with the other listed mitigations to allow /PG&E to meet planning requirements with Potrero Units 4, 5, and 6 released from their RMR Agreement
15	Add voltage support at Ravenswood substation	Scheduled for May 2007	NERC/WECC/ISO Planning Standards	This upgrade is needed in combination with the other listed mitigations to allow /PG&E to meet planning requirements with Potrero Units 4, 5, and 6 released from their RMR Agreement

APPENDIX D AIR QUALITY EMISSION CALCULATIONS

This appendix presents the following air quality emissions calculations, including assumptions, for the Trans Bay Cable Project:

- Table 1 – Fugitive Dust Emissions
- Table 2 – 12-month Cumulative Emissions for the San Francisco and Pittsburg Converter Stations
- Table 3 – Emissions Calculations for Marine Equipment

Table 1
Fugitive Dust Emissions
Trans Bay Cable Project

Parameters	Value		Comments/Basis
Emission Factor	1.3	lb/hr-acre	Midwest Research Institute (MRI, 1996) for average conditions
Hours per day	8	hr/day	
Days per month	22	days/month	Schedule provided by client
Duration of Site Preparation	8	months	Schedule provided by client
Pittsburg Converter			
Average acreage	7.5	acre	
Rate of Emissions	0.86	tons/month	
Mitigation Factor	50	percent	
Controlled Emissions	0.43	tons/month	
Controlled Emissions	39	pounds/day	
Total Controlled Emissions	3.43	tons	Assumes, that fugitive dust will only be signficant for demolition and site-preparation
San Francisco Converter			
Average acreage	5.6	acre	
Rate of Emissions	0.64	tons/month	
Mitigation Factor	50	percent	
Controlled Emissions	0.32	tons/month	
Controlled Emissions	29	pounds/day	
Total Controlled Emissions	2.56	tons	Assumes, that fugitive dust will only be signficant for demolition and site-preparation

Table 2
12-Month Cumulative Emissions for the San Francisco and Pittsburg Converter Stations
Trans Bay Cable Project

SAN FRANCISCO

	CO		NOx		PM_{10}		SOx		VOC	
Month	Monthly Emissions (lbs)	12-Month Total (lbs)	Monthly Emissions (lbs)	12-Month Total (lbs)	Monthly Emissions (lbs)	12-Month Total (lbs)	Monthly Emissions (lbs)	12-Month Total (lbs)	Monthly Emissions (lbs)	12-Month Total (lbs)
1	575	NA	1,049	NA	65	NA	139	NA	132	NA
2	703	NA	1,174	NA	78	NA	152	NA	156	NA
3	703	NA	1,174	NA	78	NA	152	NA	156	NA
4	626	NA	1,090	NA	67	NA	140	NA	139	NA
5	399	NA	753	NA	39	NA	95	NA	89	NA
6	401	NA	773	NA	42	NA	101	NA	91	NA
7	731	NA	1,241	NA	82	NA	168	NA	162	NA
8	906	NA	1,637	NA	89	NA	224	NA	184	NA
9	848	NA	1,478	NA	76	NA	204	NA	164	NA
10	736	NA	1,231	NA	69	NA	165	NA	148	NA
11	666	NA	1,184	NA	67	NA	166	NA	139	NA
12	650	7,944	1,312	14,094	77	830	198	1,905	148	1,708
13	687	8,056	1,255	14,300	80	844	186	1,951	165	1,740
14	641	7,993	1,221	14,347	67	834	179	1,978	149	1,733
15	578	7,868	1,066	14,239	59	815	157	1,983	132	1,709
16	553	7,795	994	14,143	52	800	144	1,988	124	1,695
17	545	7,942	988	14,378	52	813	144	2,036	123	1,729
18	459	8,000	837	14,442	41	813	126	2,061	100	1,738
19	392	7,661	647	13,848	38	768	99	1,991	90	1,666
20	310	7,065	469	12,681	32	711	66	1,833	64	1,545
21	262	6,479	308	11,510	29	664	40	1,669	57	1,438
22	160	5,904	186	10,465	14	609	22	1,526	35	1,325
23	70	5,308	59	9,340	4	546	6	1,366	15	1,201
24	70	4,729	59	8,086	4	473	6	1,174	15	1,068
25	70	4,112	59	6,890	4	397	6	994	15	919
26	21	3,492	35	5,705	3	333	6	821	7	777
27	21	2,935	35	4,674	3	278	6	670	7	651
Maximum	**906**	**8,056**	**1,637**	**14,442**	**89**	**844**	**224**	**2,061**	**184**	**1,740**

PITTSBURG

	CO		NOx		PM_{10}		SOx		VOC	
Month	Monthly Emissions (lbs)	12-Month Total (lbs)	Monthly Emissions (lbs)	12-Month Total (lbs)	Monthly Emissions (lbs)	12-Month Total (lbs)	Monthly Emissions (lbs)	12-Month Total (lbs)	Monthly Emissions (lbs)	12-Month Total (lbs)
1	0	NA	0	NA	0	NA	0	NA	0	NA
2	0	NA	0	NA	0	NA	0	NA	0	NA
3	0	NA	0	NA	0	NA	0	NA	0	NA
4	151	NA	348	NA	23	NA	51	NA	39	NA
5	377	NA	700	NA	38	NA	93	NA	83	NA
6	261	NA	333	NA	21	NA	36	NA	51	NA
7	579	NA	1,037	NA	70	NA	149	NA	130	NA
8	771	NA	1,443	NA	79	NA	205	NA	160	NA
9	789	NA	1,458	NA	80	NA	205	NA	164	NA
10	682	NA	1,196	NA	66	NA	170	NA	138	NA
11	567	NA	875	NA	58	434	116	NA	119	NA
12	592	NA	1,063	8,452	65	499	154	1,178	127	1,011
13	639	NA	1,111	9,563	72	570	164	1,342	150	1,161
14	546	NA	1,053	10,617	54	624	160	1,502	125	1,286
15	530	NA	942	11,559	51	675	138	1,640	119	1,405
16	490	6,822	858	12,069	44	696	126	1,715	110	1,475
17	497	6,942	864	12,233	44	702	126	1,748	111	1,503
18	440	7,121	809	12,710	41	722	125	1,838	97	1,550
19	447	6,989	815	12,487	41	693	125	1,814	98	1,518
20	318	6,536	562	11,606	28	642	83	1,691	62	1,419
21	277	6,025	406	10,554	26	588	56	1,542	55	1,310
22	91	5,433	94	9,452	7	530	11	1,384	22	1,194
23	70	4,937	59	8,636	4	476	6	1,274	15	1,090
24	70	4,415	59	7,631	4	415	6	1,126	15	978
25	70	3,846	59	6,579	4	347	6	968	15	843
26	21	3,321	35	5,561	3	296	6	813	7	724
27	21	2,812	35	4,654	3	249	6	681	7	612
Maximum	**789**	**7,121**	**1,458**	**12,710**	**80**	**722**	**205**	**1,838**	**164**	**1,550**

Table 3
Emissions Calculation For Marine Equipment
Trans Bay Cable Project

Marine Equipment Emissions During Construction

Equipment Description	Engine Power Rating (HP)		Emission Factors (lb/hp-hr) CO	NOx	PM10	SOx	POC
Marine Vessels							
Cable Ship Giulio Verne	2,268		0.0049	0.0109	0.0005	0.00162	0.0008
Cable Barge	6,000		0.0049	0.0109	0.0005	0.00001	0.0008
Dredge	6,000		0.0049	0.0109	0.0005	0.00001	0.0008

Notes:
NOx and PM10 emission factors from CFR, Title 40, Section 94.8, Table A-2 Voluntary Emission Standards.
CO emission from CFR, Title 40, Section 94.8 and it assumes that the vessel is a category 3 vessel.
SOx emission factor is based on AP-42 Table 3.4-1:Internal Combustion Engines for Stationary Engines (>600hp)
adjusted for use of 2000 ppm sulfur diesel fuel in Cable Ship and 15 ppm sulfur ultra-low sulfur diesel fuel in others.
VOC emission factor is based on AP-42 Table 3.4-1:Internal Combustion Engines for Stationary Engines (>600hp)

Month After Start of Construction	Utilization Factor (%)	Capacity Factor (%)	# of Engines	Emissions (lbs) CO	NOx	PM10	SOx	POC
Marine Vessel: Cable Ship Giulio Verne								
Month 22	100	58	4	18,699	41,137	1,870	6,150	2,841
Month 23	100	58	4	18,699	41,137	1,870	6,150	2,841
Marine Vessel: Cable Barge								
Month 20	100	55	1	11,727	25,800	1,173	29	1,782
Month 21	100	55	1	11,727	25,800	1,173	29	1,782
Month 24	100	55	1	11,727	25,800	1,173	29	1,782
Marine Vessel: Dredge								
Month 20	50	Not Appl.	2	5,212	11,466	521	13	792
Monthly Totals								
Month 20				16,939	37,266	1,694	42	2,574
Month 21				11,727	25,800	1,173	29	1,782
Month 22				18,699	41,137	1,870	6,150	2,841
Month 23				18,699	41,137	1,870	6,150	2,841
Month 24				11,727	25,800	1,173	29	1,782
Total Emissions				**77,790**	**171,139**	**7,779**	**12,399**	**11,821**

Note:
Mass emissions are calculated by the following equation: Em = EF x hrs x Equipment # x P
Em = Mass of emissions (lbs)
EF = Emission Factor for each type of engine operated (lbs/hr); Provided in top portion of this table.
hrs = Work hours per month (hours per month * utilization factor * capacity factor).
Hours per month equal 720 for Cable Ship and Cable Barge and equal 176 for Dredge.
Capacity Factor is engine average power output divided by engine rated output for a typical day.
Engine # = The number of engines on the particular vessel
P = Power per Engine (horsepower)

APPENDIX E SEDIMENT CHARACTERIZATION REPORT

This appendix presents the Sediment Characterization Report that documents the results of the Trans Bay Cable Project specific sediment sampling that was conducted along the submarine cable route in September of 2005.

SEDIMENT CHARACTERIZATION REPORT
TRANS BAY CABLE PROJECT

Prepared for
TRANS BAY CABLE LLC
and
CITY OF PITTSBURG, CALIFORNIA

Prepared by
URS Corporation
221 Main Street, Suite 600
San Francisco, CA 94105

URS Job No. 28906581
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1.1 BACKGROUND

This report presents the results of sediment sampling and analysis program performed for environmental evaluation purposes for the Trans Bay Cable Project. The sampling was based on a Sampling and Analysis Plan (SAP) submitted to the Dredged Material Management Office (DMMO) in July 2005 and formally approved by the DMMO on August 9, 2005. Sediment sampling was performed in September 2005.

The results from this program will be used to provide basic data to support the project design and to assist in the environmental review process. Specifically, the data will be used to evaluate whether dredged material meets applicable standards for disposal within San Francisco Bay. If sediment quality does not meet these standards, the intention is to adjust the proposed cable alignment to avoid such areas.

The City of Pittsburg is preparing an Environmental Impact Report (EIR) document for the proposed Trans Bay Cable Project in order to satisfy the requirements of the California Environmental Quality Act (CEQA). The City of Pittsburg is the lead agency under CEQA for the preparation of the EIR.

The remainder of Section 1.0 presents an overview of the offshore portion of the Trans Bay Cable Project and the sampling program. The field activities are described in Section 2.0. Sections 3.0 and 4.0 present the analytical program and the analytical results, respectively. The findings and conclusions are discussed in Sections 5.0 and 6.0, respectively.

1.2 PROJECT OVERVIEW AND CABLE ALIGNMENT

The proposed Trans Bay Cable Project (Project) consists of installation of an approximately 56-mile-long High Voltage Direct Current (HVDC) cable in San Francisco Bay, from a terminus in the City of Pittsburg in Contra Costa County to a terminus in the City of San Francisco in the vicinity of Potrero Point (refer to Figure 1). The Project is proposed to transmit electrical power from a converter station in Pittsburg to a converter station in San Francisco, providing a dedicated connection between the East Bay, which has excess electrical capacity and transmission grid congestion, and San Francisco. This electrical power delivered to San Francisco would help meet the City of San Francisco's electrical demand projected for 2008 and beyond.

The proposed Project includes installation of approximately 56 miles of HVDC submarine cable in the bottom of San Francisco Bay and Carquinez Straits from a converter station that would be constructed in the City of Pittsburg in Contra Costa County to a converter station that would be constructed in the City and County of San Francisco near Potrero Point. The proposed Project also includes Alternating Current (AC) and Direct Current (DC) cable segments to interconnect the proposed converter stations with existing Pacific Gas and Electric Company (PG&E) substations in Pittsburg and San Francisco.

The HVDC cable will be laid under San Francisco Bay in water as deep as possible and at depths generally planned between 3 and 6 feet below the Bay bottom. The general alignment of the cable route has been discussed with key regulatory, resource agency, and vessel traffic agencies (Figure 1).

Beginning at the San Francisco Converter Station, the proposed HVDC cable would enter the San Francisco Bay floor approximately 600 feet beyond the shoreline via a conduit placed by Horizontal Direction Drilling. The HVDC route turns north passing beneath the Bay Bridge and over the Trans Bay Tube. The proposed route continues on a northwesterly heading, remaining outside of identified shipping channels, passing to the east of Angel Island and crossing into Marin County. North of Tiburon Peninsula the route bears north beneath the San Rafael Bridge and through San Pablo Strait.

The cable route bears north-northeast, skirting the southwest side of Disposal Area DS-10 in San Pablo Bay and crosses into Contra Costa County. Continuing on a northeasterly bearing, the HVDC cable crosses to the southern side of the shipping channel. Staying within Contra Costa County, the route passed the tanker wharf at Davis Point and proceeds generally east through Carquinez Strait avoiding the anchorage between Martinez and Benicia, crosses into Solano County and enters Suisun Bay.

Between Martinez and Pittsburg, the route remains north of the dredged channels until the pipeline area at the west end of West Reach. In Honker Bay, the cable route stays south of the East Reach Channel and the Solano County line, proceeding east along the southern edge of the deep-water area until turning southwesterly and passing through Middle Slough between Browns Island and Winter Island, making landfall at Pittsburg Landing.

The proposed route from San Francisco to Pittsburg lies within San Francisco Bay, San Pablo Bay, the Carquinez Strait, Suisun Bay (New York Slough), and Honker Bay. The specific proposed route was selected with guidance from relevant agencies and organizations to avoid shipping channels, anchorages, known areas of sediment contamination, dredge disposal areas, and other known obstacles.

The cable alignment was also designed to avoid known toxic hot spots as identified by the Bay Protection and Toxic Cleanup Program (BPTCP). In the Bay region, the Regional Water Quality Control Board (RWQCB) has reviewed existing data and reports; collected and analyzed new water, sediment, and tissue samples; and prepared reports. The *Final Regional Toxic Hot Spot Cleanup Plan* (RWQCB, 1999) summarizes the situation in the Bay, and identifies Sites of Concern and Candidate Toxic Hot Spots.

1.3 REGULATORY GUIDANCE AND SAMPLING PROGRAM RATIONALE

Dredged material to be placed back in the Bay requires analysis for conformance with the U.S. Army Corps of Engineers (USACE) “Inland Testing Manual” (ITM) prior to dredging.

The *Guidelines for Implementing the Inland Testing Manual in the San Francisco Bay Regions* (DMMO, 2001) presents a tiered program for testing sediments and indicates the chemical analyses to be performed and the number of samples required based on the volume to be dredged. These guidelines were used in developing the testing program for this Project. The USACE ITM provides general guidelines on the chemical analyses to be performed. The DMMO guidelines for implementing the ITM in San Francisco Bay provide specifics on the number of samples required.

Based on Table 1 of the DMMO ITM guidelines, for dredge volumes of 20,000 to 100,000 cubic yards, analysis of 2 samples composited from material collected at 8 sample stations is required. Due to the lineal aspect of the cable alignment, this number of samples and analyses was not considered sufficient for this study to adequately characterize sediment along the length of the HVDC cable.

A number of factors were considered during development of the sampling program. First, the sampling was designed to investigate areas of greatest concern from the perspective of the potential for contaminated sediments. These areas are the shore crossings near the ends of the cable route at Pittsburg and Potrero as both of these industrial areas are known to have onshore contamination. Primary and alternative shore crossings sites have been identified at both Pittsburg and Potrero. Second, knowledge of the sediment characteristics at each proposed dredging location where the cable alignment crosses the New York Slough shipping channel also needed to be investigated. Third, in order to assemble data along the length of the cable alignment, existing Regional Monitoring Program (RMP) data needs to be considered as well as locations with a higher potential for contamination including the vicinity of bridges, near major sources of urban runoff and near existing permitted NPDES (CWA Section 402) outfalls.

A draft SAP for Bay floor sediments along the proposed cable alignment was prepared and presented to the DMMO on June 8, 2005. Based on comments received from DMMO participants, the SAP was finalized and presented to the DMMO on July 27, 2005. A letter formally approving the SAP was received on August 9, 2005.

1.4 SAMPLING LOCATIONS

A total of 39 sampling locations were identified in the approved SAP between Pittsburg and San Francisco (see Figure 1 and Table 1), as follows:

- Two sampling locations over the first mile at each of the 3 alternative Pittsburg shore crossing sites and the 2 alternative Potrero shore crossing sites using 6-foot cores (15 sampling locations)
- Two channel crossing with 2 sampling locations at each crossing using 15-foot cores (4 sampling locations)

- Sampling at an average of approximately 2.5-mile intervals along the remainder of the cable alignment using 6-foot cores (20 locations) with a focus on areas adjacent to industrial activities, near bridges, and the Pinole shoals where post-placement burial may occur

The SAP indicated one homogenized environmental sample from each 6-foot core (23 samples) and two homogenized samples from each 15-foot core (8 samples) would be tested for the analyses identified in the DMMO ITM guidelines (see Section 3.0).

2.1 SAMPLE COLLECTION

Sampling was conducted from September 21 to 30, 2005 by URS field personnel and TEG Oceanographic Services, Santa Cruz, California, using a ship-mounted vibracore. A total of 27 cores (23, 6-foot cores and 4, 15-foot cores) were collected from the 27 sampling locations shown on Figure 1.

Standard quality assurance/quality control (QA/QC) procedures were followed, including equipment decontamination, chain of custody, and collection of sediment sample duplicates and a rinseate water blank. A total of four field duplicates and one rinseate blank were collected for quality control and monitoring purposes during the field sampling.

Sampling was not performed at the planned San Francisco Bay sampling locations (SFB-4, -5, and -6) and the 6 locations offshore from the San Francisco converter station locations. These locations lie within the jurisdiction of the Port of San Francisco. In discussion with representatives of the DMMO, it was agreed that in lieu of sample collection within Port jurisdiction, existing RMP data would be used.

At each sampling location, a 6-foot section of sediment was collected in decontaminated 4-inch diameter butyrate tube liner, capped, and recorded in a field log. The core location was recorded using differential GPS. The core liners were extruded from the vibrocore on deck. Samples for geotechnical analysis were cut, capped, taped, labeled, and stored on end (top side up). The remaining core was extruded into sampling trays and split lengthways for logging. One half of the core (cut lengthwise) was discarded and the sediment from the appropriate depth interval was placed in a 5-gallon bucket and homogenized. The sediment samples were placed into laboratory-provided pre-cleaned glass jars, labeled, entered into the Chain of Custody form, and stored in iced coolers in order to keep samples at 4°C.

Each sample was given a unique identification number. QA/QC samples (blind duplicates) were also uniquely identified. Environmental samples were sent to McCampbell Analytical, Pacheco, California. Geotechnical samples were sent to Signet Testing Laboratory, Hayward, California.

2.2 FIELD OBSERVATIONS

The sediments in the cores were predominantly soft to very soft silts and clays (typical Bay Mud) with layers of fine to medium sand. The boring logs are presented in Appendix A.

Thin layers of organic matter (peat, grasses, woody material, charcoal) were found in many cores. The cores from New York Slough (NYE-1 and -2 and NYW-1 and -2) contained organic matter, wood fragments, and bark. Thin layers of dark organic matter were found in 5 samples from Suisun Bay, Carquinez Strait and San Pablo Bay (SSN-2, CQS-2, CQS-3,

SPL-1, and SPL-4). Wood and charcoal were found in one sample location in Suisun Bay (SSN-1).

Core PBG-3 from near Pittsburg contained a large amount of grassy material and core PBG-5 contained up to 90 percent peat. There was a slight odor of hydrocarbon in two layers in core SSN-6 (Suisun Bay) and in core PBG-4 (Pittsburg).

The purpose of the sediment sampling program was to characterize the sediment quality along the proposed cable route, including the two areas that would require dredging in New York Slough.

3.1 CHEMICAL ANALYSIS

One homogenized environmental sample from each 6-foot core (23 samples) and two homogenized samples from each 15-foot core (8 samples) were analyzed for the suite of analytes listed below. Duplicates of four samples and one rinseate blank, selected on a random basis, were analyzed for quality control purposes.

The analyses performed are listed below and are in conformance with Table 3 of the DMMO ITM implementation guidelines for San Francisco "Chemical and Physical Analyses":

Analyte[1]	Method
Metals	6020
Selenium	7740
Butyltins	GC-FPD/ECD
PAHs	8270D SIM
OCPs	8081B
Aroclors	8082A
Total Solids	160.3
TOC	9060

[1] PAHs = polyaromatic hydrocarbons;
OCPs = organochlorine pesticides;
TOC = total organic carbon.

The results of the chemical analyses are presented in Section 4.2.

3.2 GEOTECHNICAL ANALYSIS

The sampling program also included geotechnical analyses of core samples to identify substrate characteristics along the proposed cable route.

Two sets of geotechnical samples were collected from each 6-foot core (top and bottom of each sample) and three sets were collected from each 15-foot core (top, middle, and bottom). In most cases, the actual top and/or bottom of the cores were too disturbed to yield useful geotechnical samples, so the least disturbed samples were taken as close to the core ends as possible. The 52 geotechnical samples were tested for:

- Grain size distribution
- Undrained shear strength

- Atterberg limits

Discrete samples from all locations were analyzed for grain size distribution. American Society for Testing and Materials (ASTM) standard method D-422 was used. The results of these analyses are presented in Section 4.3. The results for the other geotechnical analyses (i.e., undrained shear strength and Atterberg limits) are required for final project design engineering and not for the purposes of characterizing sediment quality along the cable alignment. Therefore, they are not presented in this report.

4.1 DATA VALIDATION

The laboratory provided a data package suitable for conducting a Level III validation. The data was reviewed and validated by a qualified URS chemist following the EPA National Functional Guidelines for Organic and Inorganic Data Review (EPA, 1999 and 2004). In general, the analytical results were useable, with qualifications shown in Tables 2 through 4 (the J flag indicates estimated values below the Reporting Limit but above Method Detection Limit). The full data quality control report is included as Appendix B.

4.2 CHEMICAL ANALYSIS RESULTS

The chemical results are presented in Tables 2 through 4. The results are compared against the National Oceanic and Atmospheric Administration (NOAA) sediment benchmarks termed Effects Range Low (ERL) and Effects Range Mean (ERM). The ERL is the concentration, below which, toxic or adverse effects in organisms living in the sediment are rarely observed. The ERM is the concentration, above which, adverse effects are frequently observed. Sediment concentrations greater the ERM are generally interpreted as an indication of contamination.

No PAH compounds were detected above their respective ERLs (Table 2). In most samples PAH concentrations were below the Reporting Limit. Those PAHs that were detected are well below the ERL benchmarks.

Table 3 summarizes the metals results. Cadmium, lead, and silver were not detected at levels above ERLs. All but one of the zinc concentrations were below the ERL; the highest detected concentration of was at the ERL of 150 mg/kg. Arsenic, chromium, copper, and mercury were detected at concentrations above the ERLs, but below the ERMs. The maximum mercury concentrations detected, 0.45 to 0.51 mg/kg (in San Pablo Bay), are very close to the ambient fine sediment mercury concentration of 0.43 mg/kg in San Francisco Estuary (RWQCB, 2000). Selenium was detected in approximately three-quarters of the samples, mainly at concentrations less than the ambient fines concentration of 0.64 mg/kg. The bottom samples from west New York Slough (NYW-1-B and NYW-2-B) showed selenium concentrations up to 1.1 mg/kg.

Table 3 shows many nickel concentrations above the ERM value. However, the naturally occurring concentrations of nickel in Bay area sediments are much higher than the National sediment benchmarks. Nickel concentrations in the samples ranged from 36 to 120 mg/kg, all of which are above the ERL of 20.9 mg/kg, and 29 samples had concentrations above the ERM of 51.6 mg/kg. The highest nickel concentrations (120 mg/kg) were in the samples from New York Slough. While the concentrations of nickel are above the NOAA benchmarks, they are not elevated compared to the ambient concentrations of chemicals in San Francisco Bay sediments developed by the RWQCB for Beneficial Reuse of Dredged

Materials (RWQCB, 2000). Because nickel naturally occurs in Bay Area rock formations, the ambient concentration of nickel in Bay sediment is 112 mg/kg. Therefore, the measured range of values is consistent with background concentrations.

Table 4 indicates that no pesticides, PCBs, or butyltins were detected in the sediment samples at concentrations above the Reporting Limits.

4.3 GRAIN SIZE ANALYSIS RESULTS

Sediment samples were analyzed for grain size distribution. Table 5 summarizes the results. The sediments are generally described as Bay Mud and consist of fine silt and clay with fine sand and occasional shell fragments or layers.

To provide context, the above measured sediment data were compared to available Regional Monitoring Program (RMP) data from stations along the cable alignment (SFEI, 2005a). Since 1993, the San Francisco Estuary Institute (SFEI) has administered a Regional Monitoring Program (RMP) for the Regional Water Quality Control Board (RWQCB) and major Bay dischargers. Most dischargers to the Bay are required to participate as a condition of their discharge permit. SFEI conducts monitoring from the Delta to the South Bay. The Estuary is divided into five regions, and eight random locations are sampled within each region each year for sediment quality (SFEI, 2005a,b). Four or more random locations within each region are sampled for water quality. In addition, a few historical fixed sites are sampled annually for long-term trend analysis.

Figure 1 shows sampling locations from the RMP along the proposed cable alignment. Sediment data from 10 RMP stations was compared to the results from the TBC sampling program. Table 6 presents the RMP analytical results (the RMP stations naming convention includes CB: Central Bay, SPB: San Pablo Bay, SU: Suisun Bay).

Table 6 shows that with the exception of 2 samples, no PAHs, pesticides, or PCBs (total) were detected at the 10 RMP stations at levels above the ERLs. The sample from RMP Station CB012S near Pier 80 in San Francisco had 8 of the 17 analyzed PAHs at concentrations above the ERL but below the ERM. Station CB012S is located offshore of the Southeast Water Pollution Control Plant discharge, which extends offshore from the end of Pier 80. The sample from location CB073S (between Treasure and Angel Islands) contained benzo(a)pyrene at a concentration just above the ERL. SU008S (Suisun Bay near Roe Island) had a dieldrin concentration above the ERL.

Cadmium, copper, lead, selenium, silver, and zinc were not detected above the ERLs at the RMP stations. Arsenic was detected at levels from 2.8 to 11.5 mg/kg, the same range as shown in Table 4. The ERL for arsenic is 8.2 mg/kg and the ERM is 70 mg/kg. Mercury was detected above the ERL in some samples but below the ERM in all cases. Similar to the Table 4 results, mercury was detected at all stations except only one location in Suisun Bay (SU010S). The RMP nickel concentrations are above the ERM at all sample locations with the highest concentration, 154 mg/kg, at station SU008S (Suisun Bay). Again, this range of nickel concentrations is consistent with ambient concentrations.

Table 7 presents a summary of sediment data for locations along the proposed alignment, including both the samples taken for this program and the RMP data. In general, with the exception of RMP location CB012S (Pier 80), sediment results were comparable between the RMP stations along the alignment and the samples taken for the project. Station CB012S is approximately 1,800 feet southeast of the cable route where the route turns towards San Francisco at mile marker 0.4 (refer to Figure 1). When data from this sample is discounted, only one PAH, acenaphthene, was detected above the ERL (but below the ERM) for the

RMP stations along the alignment. The maximum concentrations, when the CB012S results are not included, are shown in the far rightmost column of Table 7.

SECTION 6.0 CONCLUSIONS

Sediment cores were collected from 27 locations (23 of 6-foot cores and 4 of 15-foot cores) using a vibracore. A total of 36 sediment samples (including duplicates) were collected from the cores for chemical analyses.

The sediment analytical results do not show evidence of sediment concentrations above the NOAA ERM benchmarks that are used as an indication of contamination, with the exception of nickel. However, the elevated nickel concentrations near New York Slough are consistent with the RWQCB ambient concentrations for San Francisco Estuary (RWQCB, 2000). Sediment concentrations that are above ERLs are also consistent with the ambient concentrations for the Estuary.

Sediment samples were not collected at sampling locations within the jurisdiction of the Port of San Francisco. However, data from the RMP stations within Port jurisdiction also do not show evidence of sediment concentrations above the NOAA ERM benchmarks.

Based on the results of the sediment sampling and analysis performed for the Trans Bay Cable Project, including the review of applicable RMP station data, the proposed cable alignment does not appear to traverse areas with constituent levels elevated above ambient concentrations. Therefore, the results of this sediment sampling program indicate that there is no need to adjust the proposed cable alignment to avoid areas with elevated sediment concentrations for constituents of potential concern.

The results of the sediment sampling and analysis also indicate that sediment constituent levels at the New York Slough channel crossings are not above ambient concentrations. Therefore, material dredged at the channel crossing could be held temporarily in barges and replaced after the cables have been laid. Alternatively, because the dredged material meets RWQCB criteria for beneficial reuse of dredged material (RWQCB, 2000), the material could be used for that purpose.

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U.S. Environmental Protection Agency (EPA). 1999. EPA National Functional Guidelines for Organic Data Review.

2004. EPA National Functional Guidelines for Inorganic Data Review.

TABLE 1
SEDIMENT SAMPLING LOCATIONS[1]

ID	Lat/Long		Description
Pittsburg Shore Crossings (4 locations)			
PBG-1	38°02.52'N	121°53.70'W	Pittsburg Crossing
PBG-2	38°02.57'N	121°53.66'W	Pittsburg Crossing
PBG-3	38°02.48'N	121°53.81'W	Pittsburg Crossing – Alt 1
PBG-4	38°02.54'N	121°53.85'W	Pittsburg Crossing – Alt 1
PBG-5	38°02.56'N	121°53.35'W	Pittsburg Crossing – Alt 2
New York Slough Maintained Channel Crossings (4 locations)			
NYE-1	38°01.70'N	121°50.83'W	South side, East Reach Crossing
NYE-2	38°01.77'N	121°50.91'W	North side, East Reach Crossing
NYW-1	38°02.67'N	121°53.20'W	East side, West Reach Crossing
NYW-2	38°02.65'N	121°53.30'W	West side, West Reach Crossing
Suisun Bay (7 locations)			
SSN-1	38°03.00'N	121°51.83'W	North entrance to Middle Slough
SSN-2	38°02.76'N	121°55.83'W	North of Mallard Slough entrance
SSN-3	38°03.75'N	121°57.94'W	Centered between RMP stations SU014S, SU018S, SU00
SSN-4	38°04.42'N	122°00.24'W	East end of Hayser Island centered between RMP stations SU013S and SU008S
SSN-5	38°04.83'N	122°02.42'W	North of Roe Island
SSN-6	38°04.50'N	122°05.20'W	Midway between RMP stations SU007S and SU019S
SSN-7	38°03.00'N	122°06.70'W	East of Martinez Bridge (near splice)
Carquinez Straits (3 locations)			
CQS-1	38°01.91'N	122°08.32'W	Near entrance to Marina
CQS-2	38°02.63'N	122°10.05'W	Near Contra Costa City SD#5
CQS-3	38°03.61'N	122°13.26'W	East of Carquinez Bridge near outfalls
San Pablo Bay (5 locations)			
SPL-1	38°03.45'N	122°16.20'W	Between DS-9 and HPR Outfall
SPL-2	38°03.00'N	122°18.85'W	East end of Pinole Shoals
SPL-3	38°02.18'N	122°21.15'W	Middle of Pinole Shoals
SPL-4	38°00.96'N	122°24.10'W	North of DS-10 and RMP station SPB010
SPL-5	37°59.74'N	122°25.58'W	South of DS-10
San Francisco Bay (6 locations)			
SFB-1	37°57.25'N	122°27.08'W	Just North of Central Marin Sanitation Outfall
SFB-2	37°55.84'N	122°27.05'W	Just South of Richmond-San Rafael Bridge
SFB-3	37°53.55'N	122°26.58'W	Near Pt Chauncey
SFB-4	37°51.60'N	122°24.82'W	East of Angel Island
SFB-5	37°48.86'N	122°23.63'W	North of Pier 29
SFB-6	37°47.25'N	122°22.44'W	East of Pier 30/32
Potrero Shore Crossings (6 locations)			
PRR-1	37°45.37'N	122°22.67'W	Potrero Crossing – 800ft east
PRR-2	37°45.40'N	122°22.55'W	Potrero Crossing –1,500ft east
PRR-3	37°45.33'N	122°22.60'W	Potrero Crossing - Alt
PRR-4	37°45.37'N	122°22.50'W	Potrero Crossing - Alt
PRR-5	37°45.65'N	122°22.44'W	South East of Pier 70
PRR-6	37°45.88'N	122°22.43'W	North East of Pier 70

[1] Refer to Figure 1 for locations of sediment samples.

TABLE 2
SEDIMENT POLYHYDROCARBON (PAH) RESULTS

Analyte	Units	ERM[2] mg/kg	ERL[2] mg/kg	Location[1] Date Sampled (Date Analyzed) PBG-1 9/21/05 (9/22-25/05)	PBG-2 9/23/05 (9/27-10/1/05)	PBG-3 9/22/05 (9/23-25/05)	PBG-4 9/22/05 (9/23-26/05)	PPG-5 9/23/05 (9/27-10/1/05)	NYW-2-B 9/26/05 (9/27-10/5/05)	NYW-2-T 9/26/05 (9/27-10/5/05)	NYW-1-B 9/26/05 (9/27-10/5/05)	NYW-1-T 9/26/05 (9/27-10/5/05)	NYE-1B 9/23/05 (9/27-10/1/05)	NYE-1A 9/23/05 (9/27-10/1/05)	NYE-2B 9/27/05 (9/28-10/7/05)
%Solids	%			81.9	66.2	12.1	74.7	30.9	57.6	53.5	37.1	41.6	72.6	78.7	77.4
Total Organic Carbon	mg/kg			970	7,100	390,000	6,200	110,000	24,000	35,000	140,000	70,000	3,900	2,800	6,900
Polyaromatic Hydrocarbons															
Acenaphthene	mg/kg	0.5	0.016	<0.0024	<0.0076	<0.017	<0.0020	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Acenaphthylene	mg/kg	0.64	0.044	<0.0024	<0.0076	<0.017	<0.0020	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Anthracene	mg/kg	1.1	0.0853	<0.0018	<0.0076	<0.012	<0.0015	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Benzo (a) Anthracene	mg/kg	1.6	0.261	<0.0031	<0.0076	<0.021	<0.0025	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Benzo (a) Pyrene	mg/kg	1.6	0.43	<0.0049	<0.0076	<0.033	<0.0040	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Benzo (b) Fluoranthene	mg/kg	3.6	3.6	<0.0031	<0.0076	<0.021	<0.0025	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Benzo (g,h,i) Perylene	mg/kg	0.72	0.72	<0.0031	<0.0076	<0.021	<0.0025	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Benzo (k) Fluoranthene	mg/kg	3.6	3.6	<0.0031	<0.0076	<0.021	<0.0025	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Chrysene	mg/kg	2.8	0.384	<0.0037	<0.0076	<0.025	<0.0030	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Dibenzo (a,h) Anthracene	mg/kg	0.26	0.0634	<0.0043	<0.0076	<0.029	<0.0035	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Fluoranthene	mg/kg	5.1	0.6	<0.0024	<0.0076	<0.017	<0.0020	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Fluorene	mg/kg	0.54	0.019	<0.0031	<0.0076	<0.021	<0.0025	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Indeno (1,2,3-cd) Pyrene	mg/kg	0.69	0.69	<0.0043	<0.0076	<0.029	<0.0035	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
1-Methylnaphthalene	mg/kg	0.67	0.07	<0.0024	<0.0076	<0.017	<0.0020	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
2-Methylnaphthalene	mg/kg	0.67	0.07	<0.0037	<0.0076	<0.025	<0.0030	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Naphthalene	mg/kg	2.1	0.16	0.0029 J[3]	<0.0076	.019 J	0.0031 J	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Phenanthrene	mg/kg	1.5	0.24	<0.0024	<0.0076	<0.017	<0.0020	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065
Pyrene	mg/kg	2.6	0.665	<0.0043	<0.0076	<0.029	<0.0035	<0.016	<0.0087	<0.0093	<0.013	<0.012	<0.0069	<0.0064	<0.0065

[1] Refer to Figure 1 for sample locations

[2] ERM = Effects Range Mean; ERC = Effects Range Low.

[3] "J" = Estimated concentration (between the Reporting Limit and the Method Detection Limit).

TABLE 2
SEDIMENT POLYHYDROCARBON (PAH) RESULTS

Analyte	Units	ERM[2] mg/kg	ERL[2] mg/kg	Location[1] Date Sampled (Date Analyzed) NYE-2A 9/27/05 9/28-10/7/05	SSN-1 9/21/05 (9/22-25/05)	SSN-2 9/22/05 (9/23-26/05)	SSN-3 9/27/05 (9/28-10/7/05)	SSN-4 9/27/05 (9/28-10/7/05)	SSN-5 9/28/05 (9/29-10/7/05)	SSN-6 9/28/05 (9/29-10/7/05)	SSN-7 9/28/05 (9/29-10/7/05)	CQS-1 9/28/05 (9/29-10/7/05)	CQS-2 9/29/05 (9/30-10/7/05)	CQS-3 9/29/05 (9/30-10/7/05)	SPL-1 9/29/05 (9/30-10/7/05)
%Solids	%			84.3	53.9	75.7	71.1	69.3	59.1	54.2	54	69.7	43.1	68.5	59.9
Total Organic Carbon	mg/kg			490	19,000	3500	2400	2600	7100	9000	14000	3100	5300	5600	5200
Polyaromatic Hydrocarbons															
Acenaphthene	mg/kg	0.5	0.016	<0.0059	<0.0037	<0.0020	<0.0070	<0.0072	<0.0083	<0.0092	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Acenaphthylene	mg/kg	0.64	0.044	<0.0059	<0.0037	<0.0020	<0.0070	<0.0072	<0.0083	<0.0092	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Anthracene	mg/kg	1.1	0.0853	<0.0059	<0.0028	<0.0015	<0.0070	<0.0072	<0.0083	<0.0092	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Benzo (a) Anthracene	mg/kg	1.6	0.261	<0.0059	<0.0046	<0.0025	<0.0070	<0.0072	<0.0083	0.017	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Benzo (a) Pyrene	mg/kg	1.6	0.43	<0.0059	<0.0074	<0.0040	0.0082	<0.0072	<0.0083	<0.0092	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Benzo (b) Fluoranthene	mg/kg	3.6	3.6	<0.0059	0.0053 J	<0.0025	<0.0070	<0.0072	<0.0083	0.027	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Benzo (g,h,i) Perylene	mg/kg	0.72	0.72	<0.0059	0.0058 J	<0.0025	0.011	<0.0072	<0.0083	0.038	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Benzo (k) Fluoranthene	mg/kg	3.6	3.6	<0.0059	<0.0046	<0.0025	<0.0070	<0.0072	<0.0083	0.019	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Chrysene	mg/kg	2.8	0.384	<0.0059	<0.0056	<0.0030	<0.0070	<0.0072	<0.0083	0.021	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Dibenzo (a,h) Anthracene	mg/kg	0.26	0.0634	<0.0059	<0.0065	<0.0035	<0.0070	<0.0072	<0.0083	<0.0092	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Fluoranthene	mg/kg	5.1	0.6	<0.0059	<0.0037	<0.0020	0.011	<0.0072	<0.0083	0.067	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Fluorene	mg/kg	0.54	0.019	<0.0059	<0.0046	<0.0025	<0.0070	<0.0072	<0.0083	<0.0092	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Indeno (1,2,3-cd) Pyrene	mg/kg	0.69	0.69	<0.0059	<0.0065	<0.0035	0.008	<0.0072	<0.0083	0.025	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
1-Methylnaphthalene	mg/kg	0.67	0.07	<0.0059	<0.0037	<0.0020	<0.0070	<0.0072	<0.0083	<0.0092	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
2-Methylnaphthalene	mg/kg	0.67	0.07	<0.0059	<0.0056	<0.0030	<0.0070	<0.0072	<0.0083	<0.0092	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Naphthalene	mg/kg	2.1	0.16	<0.0059	0.0046 J	0.0029 J	<0.0070	<0.0072	<0.0083	<0.0092	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Phenanthrene	mg/kg	1.5	0.24	<0.0059	<0.0037	<0.0020	<0.0070	<0.0072	<0.0083	0.012	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083
Pyrene	mg/kg	2.6	0.665	<0.0059	<0.0065	<0.0035	0.013	<0.0072	<0.0083	0.085	<0.0093	<0.0072	<0.0094	<0.0073	<0.0083

[1] Refer to Figure 1 for sample locations.

[2] ERM = Effects Range Mean; ERC = Effects Range Low.

[3] "J" = Estimated concentration (between the Reporting Limit and the Method Detection Limit).

TABLE 2
SEDIMENT POLYHYDROCARBON (PAH) RESULTS

Analyte	Units	ERM[2] mg/kg	ERL[2] mg/kg	Location[1] Date Sampled (Date Analyzed) SPL-2 9/29/05 9/30-10/7/05	SPL-3 9/29/05 (9/30-10/7/05)	SPL-4 9/29/05 (9/30-10/7/05)	SPL-5 9/30/05 (10/3-13/05)	SFB-1 9/30/05 (10/3-13/05)	SFB-2 9/30/05 (10/3-13/05)	SFB-3 9/30/05 (10/3-13/05)	DUP-1 9/23/05 (9/27-10/1/05) (Dup of PBG-2)	DUP-2 9/27/05 (9/28-10/7/05) (Dup of SSN-3)	DUP-3 9/30/05 (10/3-13/05) (Dup of SFB-2)	DUP-4 9/30/05 (10/3-13/05) (Dup of SFB-1)	9-21-RINSATE 9/21/05 (9/22-25/05) (mg/l)
%Solids	%			69.8	52.8	53.5	52.7	50.8	61.4	60.2	68.1	69	61.2	51.6	
Total Organic Carbon	mg/kg			3900	11000	11000	11000	11000	7700	6400	6,300	4,000	8,800	17,000	
Polyaromatic Hydrocarbons															
Acenaphthene	mg/kg	0.5	0.016	<0.0072	<0.0095	<0.0093	<0.0095	<0.0098	<0.0081	<0.0083	<0.0073	<0.0072	<0.0082	<0.0097	ND
Acenaphthylene	mg/kg	0.64	0.044	<0.0072	<0.0095	<0.0093	<0.0095	<0.0098	<0.0081	<0.0083	<0.0073	<0.0072	<0.0082	<0.0097	ND
Anthracene	mg/kg	1.1	0.0853	<0.0072	<0.0095	<0.0093	<0.0095	<0.0098	<0.0081	<0.0083	<0.0073	<0.0072	<0.0082	<0.0097	ND
Benzo (a) Anthracene	mg/kg	1.6	0.261	<0.0072	<0.0095	<0.0093	0.014	0.016	0.0092	0.0084	<0.0073	<0.0072	0.0095	0.018	ND
Benzo (a) Pyrene	mg/kg	1.6	0.43	<0.0072	<0.0095	<0.0093	0.022	0.027	0.014	0.01	<0.0073	0.008	0.017	0.027	ND
Benzo (b) Fluoranthene	mg/kg	3.6	3.6	<0.0072	<0.0095	<0.0093	0.017	0.023	0.0082	0.01	<0.0073	<0.0072	0.01	0.02	ND
Benzo (g,h,i) Perylene	mg/kg	0.72	0.72	<0.0072	<0.0095	<0.0093	0.029	0.031	0.018	0.013	<0.0073	0.01	0.023	0.033	ND
Benzo (k) Fluoranthene	mg/kg	3.6	3.6	<0.0072	<0.0095	<0.0093	0.017	0.012	<0.0081	0.0089	<0.0073	<0.0072	0.0097	0.019	ND
Chrysene	mg/kg	2.8	0.384	<0.0072	<0.0095	<0.0093	0.018	0.018	0.0092	0.0087	<0.0073	<0.0072	0.01	0.022	ND
Dibenzo (a,h) Anthracene	mg/kg	0.26	0.0634	<0.0072	<0.0095	<0.0093	<0.0095	<0.0098	<0.0081	<0.0083	<0.0073	<0.0072	<0.0082	<0.0097	ND
Fluoranthene	mg/kg	5.1	0.6	<0.0072	<0.0095	<0.0093	0.026	0.034	0.017	0.016	<0.0073	0.0099	0.018	0.036	ND
Fluorene	mg/kg	0.54	0.019	<0.0072	<0.0095	<0.0093	<0.0095	<0.0098	<0.0081	<0.0083	<0.0073	<0.0072	<0.0082	<0.0097	ND
Indeno (1,2,3-cd) Pyrene	mg/kg	0.69	0.69	<0.0072	<0.0095	<0.0093	0.018	0.019	0.011	0.0084	<0.0073	0.0073	0.015	0.02	ND
1-Methylnaphthalene	mg/kg	0.67	0.07	<0.0072	<0.0095	<0.0093	<0.0095	<0.0098	<0.0081	<0.0083	<0.0073	<0.0072	<0.0082	<0.0097	ND
2-Methylnaphthalene	mg/kg	0.67	0.07	<0.0072	<0.0095	<0.0093	<0.0095	<0.0098	<0.0081	<0.0083	<0.0073	<0.0072	<0.0082	<0.0097	ND
Naphthalene	mg/kg	2.1	0.16	<0.0072	<0.0095	<0.0093	<0.0095	<0.0098	<0.0081	<0.0083	<0.0073	<0.0072	<0.0082	<0.0097	ND
Phenanthrene	mg/kg	1.5	0.24	<0.0072	<0.0095	<0.0093	<0.0095	<0.0098	<0.0081	<0.0083	<0.0073	<0.0072	<0.0082	<0.0097	ND
Pyrene	mg/kg	2.6	0.665	<0.0072	<0.0095	<0.0093	0.025	0.03	0.013	0.013	<0.0073	0.012	0.014	0.033	ND

[1] Refer to Figure 1 for sample locations

[2] ERM = Effects Range Mean; ERC = Effects Range Low.

[3] "J" = Estimated concentration (between the Reporting Limit and the Method Detection Limit).

R:/AB/3

TABLE 3
SEDIMENT METALS RESULTS

Analyte	Units	ERM mg/kg	ERL mg/kg	Location[1] Date Sampled (Date Analyzed) PBG-1 9/21/05 (9/22-25/05)	PBG-2 9/23/05 (9/27-10/1/05)	PBG-3 9/22/05 (9/23-25/05)	PBG-4 9/22/05 (9/23-26/05)	PPG-5 9/23/05 (9/27-10/1/05)	NYW-2-B 9/26/05 (9/27-10/5/05)	NYW-2-T 9/26/05 (9/27-10/5/05)	NYW-1-B 9/26/05 (9/27-10/5/05)	NYW-1-T 9/26/05 (9/27-10/5/05)	NYE-1B 9/23/05 (9/27-10/1/05)	NYE-1A 9/23/05 (9/27-10/1/05)	NYE-2B 9/27/05 (9/28-10/7/05)
Arsenic	mg/kg	70	8.2	4.6	4.9	**12**	**8.3**	6.9	**17**	**12**	**15**	**9.6**	**67**	4.9	5.8
Cadmium	mg/kg	9.6	1.2	0.041 J	0.19	0.1 J	0.21 J	0.24 J	0.25 J	0.21 J	0.18 J	0.19 J	0.17 J	0.033 J	0.78 J
Chromium	mg/kg	370	81	42	46	29	53	44	**97**	77	70	**84**	**93**	49	43
Copper	mg/kg	270	34	11	25	22	31	**37**	**69**	**55**	**53**	**58**	**59**	14	8.7
Lead	mg/kg	218	46.7	3	8.4	3.3	8.8	9.3	11	8.6	7.4	8.8	8.8	3	3.6
Mercury	mg/kg	0.71	0.15	0.03	0.11	0.14	0.046 J	0.10 J	0.095	0.079 J	0.071 J	0.078 J	0.14	0.023 J	0.031 J
Nickel	mg/kg	51.6	20.9	**49**	**54**	**36**	**56**	**50**	**120**	**120**	**68**	**86**	**120**	**46**	**59**
Selenium	mg/kg			<0.0049	0.19	<0.83	0.28 J	<0.32	1.1	<0.19	0.92 J	0.56 J	0.26 J	<0.13	<0.13
Silver	mg/kg	3.7	1	0.025 J	0.11 J	0.081 J	0.12 J	0.096 J	0.17	0.17 J	0.15 J	0.16 J	0.12 J	0.036 J	0.026 J
Zinc	mg/kg	410	150	28	70	22	83	62	100	90	68	85	92	34	34

Analyte	Units	ERM mg/kg	ERL mg/kg	NYE-2A 9/27/05 (9/28-10/7/05)	SSN-1 9/21/05 (9/22-25/05)	SSN-2 9/22/05 (9/23-26/05)	SSN-3 9/27/05 (9/28-10/7/05)	SSN-4 9/27/05 (9/28-10/7/05)	SSN-5 9/28/05 (9/29-10/7/05)	SSN-6 9/28/05 (9/29-10/7/05)	SSN-7 9/28/05 (9/29-10/7/05)	CQS-1 9/28/05 (9/29-10/7/05)	CQS-2 9/29/05 (9/30-10/7/05)	CQS-3 9/29/05 (9/30-10/7/05)	SPL-1 9/29/05 (9/30-10/7/05)
Arsenic	mg/kg	70	8.2	3.8	**12**	5.6	**9.7**	**10**	**11**	**24**	**11**	6	**18**	**22**	**17**
Cadmium	mg/kg	9.6	1.2	0.058 J	0.43	0.11 J	0.13 J	0.13 J	0.3	0.44	0.18 J	0.091 J	0.17 J	0.2	0.14 J
Chromium	mg/kg	370	81	39	**93**	48	59	62	**87**	**98**	**97**	70	**91**	69	**100**
Copper	mg/kg	270	34	6.5	**62**	24	24	29	**41**	**66**	**38**	21	**54**	16	**56**
Lead	mg/kg	218	46.7	3.3	21	7.4	6.9	8.6	19	25	9.6	4.9	15	15	13
Mercury	mg/kg	0.71	0.15	0.023 J	**0.26**	0.025 J	0.121	**0.17**	**0.26**	**0.46**	0.062	0.025	**0.45**	0.09	**0.51**
Nickel	mg/kg	51.6	20.9	**45**	**100**	**45**	**60**	**94**	**92**	**99**	**100**	**83**	**72**	**88**	**87**
Selenium	mg/kg			<0.12	0.45	0.17 J	0.16 J	0.21 J	0.27	0.73	0.42	0.15	0.58	<0.15	0.5
Silver	mg/kg	3.7	1	0.019 J	0.23	0.088 J	0.055	0.093 J	0.19	0.21	0.11 J	0.047 J	0.12 J	0.032	0.10 J
Zinc	mg/kg	410	150	30	140	58	52	55	110	150	93	59	74	83	76

Analyte	Units	ERM mg/kg	ERL mg/kg	SPL-2 9/29/05 (9/30-10/7/05)	SPL-3 9/29/05 (9/30-10/7/05)	SPL-4 9/29/05 (9/30-10/7/05)	SPL-5 9/30/05 (10/3-13/05)	SFB-1 9/30/05 (10/3-13/05)	SFB-2 9/30/05 (10/3-13/05)	SFB-3 9/30/05 (10/3-13/05)	DUP-1 9/23/05 (9/27-10/1/05) (Dup of PBG-2)	DUP-2 9/27/05 (9/28-10/7/05) (Dup of SSN-3)	DUP-3 9/30/05 (10/3-13/05) (Dup of SFB-2)	DUP-4 9/30/05 (10/3-13/05) (Dup of SFB-1)	9-21-RINSATE 9/21/05 (9/22-25/05)
Arsenic	mg/kg	70	8.2	**11**	**9.3**	**9.5**	**13**	**9.5**	**8.7**	**9.3**	6	**9.5**	7.8	**12**	2.5
Cadmium	mg/kg	9.6	1.2	0.096 J	0.2	0.24	0.42	0.22	0.16 J	0.19	0.19	0.13 J	0.15 J	0.3	ND
Chromium	mg/kg	370	81	71	**100**	**93**	**81**	**82**	**94**	70	61	67	74	**100**	2.7
Copper	mg/kg	270	34	24	**36**	**40**	**49**	47	28	35	31	25	23	58	6.4
Lead	mg/kg	218	46.7	6.1	10	8.9	29	19	8.6	16	11	7.1	7.2	24	2.1
Mercury	mg/kg	0.71	0.15	0.1	**0.15**	0.14	**0.47**	0.26	0.1	0.18	0.12	0.14	0.089	0.33	0.016
Nickel	mg/kg	51.6	20.9	**90**	**97**	**98**	**80**	**87**	**88**	**79**	**65**	**63**	**72**	**110**	3.3
Selenium	mg/kg			0.2	0.4	0.35 J	0.53	0.36	0.32	0.27	0.18 J	0.19 J	0.3	0.48	ND
Silver	mg/kg	3.7	1	0.064 J	0.12 J	0.12	0.36	0.23	0.082 J	0.16 J	0.10 J	0.057 J	0.064 J	0.29	ND
Zinc	mg/kg	410	150	68	90	89	110	100	75	85	80	56	63	130	12

[1] Refer to Figure 1 for sample locations.

[2] ERM = Effects Range Mean; ERL = Effects Range Low; **bold** = above ERL; **bold, underline** = above ERM.

[3] J = Estimated concentration (between the Reporting Limit and Method Detection Limit).

TABLE 4
SEDIMENT PESTICIDE AND BUTYLTIN RESULTS

Analyte	Units	ERM[2] mg/kg	ERL[2] mg/kg	Location[1] Date Sampled (Date Analyzed) PBG-1 9/21/05 (9/30/05)	PBG-2 9/23/05 (9/27-10/1/05)	PBG-3 9/21/05 (9/30/05)	PBG-4 9/22/05 (9/30/05)	PPG-5 9/23/05 (9/27-10/1/05)	NYW-2-B 9/26/05 (9/27-10/5/05)	NYW-2-T 9/26/05 (9/27-10/5/05)	NYW-1-B 9/26/05 (9/27-10/5/05)	NYW-1-T 9/26/05 (9/27-10/5/05)	NYE-2B 9/27/05 (9/28-10/7/05)	NYE-2A 9/27/05 (9/28-10/7/05)	NYE-1B 9/23/05 (9/27-10/1/05)
Pesticides															
Aldrin	mg/kg	—[3]		<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
BHC, alpha	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
BHC, beta	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
BHC delta	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
BHC, gamma	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
Chlordane (Total)	mg/kg			<0.015	<0.19	<0.10	<0.017	<0.40	<0.043	<0.047	<0.067	<0.060	<0.032	<0.030	<0.034
Chlordane, alpha	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
Chlordane, gamma	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
o,p-DDD	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
o,p-DDD	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
o,p- DDE	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
o,p- DDE	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
o,p-DDT	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
o,p-DDT	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
p,p-DDD	mg/kg	0.02	0.002	<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
p,p-DDE	mg/kg	0.027	0.0022	<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
p,p-DDT	mg/kg	0.007	0.001	<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
Dieldrin	mg/kg	0.008	0.00002	<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
Endosulfan I (alpha)	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
Endosulfan II (beta)	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
Endosulfan sulfate	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
Endrin	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
Endrin aldehyde	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
Heptachlor	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
Heptachlor Epoxide	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
Methoxychlor	mg/kg			<0.00061	<0.0038	<0.0041	<0.00067	<0.0081	<0.00087	<0.00093	<0.0013	<0.0012	<0.00065	<0.00059	<0.00069
Toxaphene	mg/kg			<0.061	<0.38	<0.41	<0.067	<0.81	<0.087	<0.093	<0.13	<0.12	<0.065	<0.059	<0.069
Aroclor 1016	mg/kg			<0.031	<0.19	<0.21	<0.033	<0.40	<0.043	<0.047	<0.067	<0.060	<0.032	<0.030	<0.034
Aroclor 1221	mg/kg			<0.031	<0.19	<0.21	<0.033	<0.40	<0.043	<0.047	<0.067	<0.060	<0.032	<0.030	<0.034
Aroclor 1232	mg/kg			<0.031	<0.19	<0.21	<0.033	<0.40	<0.043	<0.047	<0.067	<0.060	<0.032	<0.030	<0.034
Aroclor 1242	mg/kg			<0.031	<0.19	<0.21	<0.033	<0.40	<0.043	<0.047	<0.067	<0.060	<0.032	<0.030	<0.034
Aroclor 1248	mg/kg			<0.031	<0.19	<0.21	<0.033	<0.40	<0.043	<0.047	<0.067	<0.060	<0.032	<0.030	<0.034
Aroclor 1254	mg/kg			<0.031	<0.19	<0.21	<0.033	<0.40	<0.043	<0.047	<0.067	<0.060	<0.032	<0.030	<0.034
Aroclor 1260	mg/kg			<0.031	<0.19	<0.21	<0.033	<0.40	<0.043	<0.047	<0.067	<0.060	<0.032	<0.030	<0.034
Total PCB's	mg/kg			<0.031	<0.19	<0.21	<0.033	<0.40	<0.043	<0.047	<0.067	<0.060	<0.032	<0.030	<0.034
Butylins															
Dybutyltin	mg/kg			<0.0024	<0.0030	<0.017	<0.0013	<0.0065	<0.0035	<0.0037	<0.0054	<0.0048	<0.0026	<0.0024	<0.0028
Monobutyltin	mg/kg			<0.0024	<0.0030	<0.017	<0.0013	<0.0065	<0.0035	<0.0037	<0.0054	<0.0048	<0.0026	<0.0024	<0.0028
Tetrabutyltin	mg/kg			<0.0024	<0.0030	<0.017	<0.0013	<0.0065	<0.0035	<0.0037	<0.0054	<0.0048	<0.0026	<0.0024	<0.0028
Tributyltin	mg/kg			<0.0024	<0.0030	<0.017	<0.0013	<0.0065	<0.0035	<0.0037	<0.0054	<0.0048	<0.0026	<0.0024	<0.0028
Total Butyltins	mg/kg			<0.0024	<0.0030	<0.017	<0.0013	<0.0065	<0.0035	<0.0037	<0.0054	<0.0048	<0.0026	<0.0024	<0.0028

[1] Refer to Figure 1 for sample locations.

[2] ERM = Effects Range Mean; ERL = Effects Range Low.

[3] Blank = not applicable.

TABLE 4
SEDIMENT PESTICIDE AND BUTYLTIN RESULTS

Analyte	Units	ERM[2] mg/kg	ERL[2] mg/kg	Location[1] Date Sampled (Date Analyzed) NYE-1A 9/23/05 (9/27-10/1/05)	SSN-1 9/21/05 (9/30/05)	SSN-2 9/22/05 (9/30/05)	SSN-3 9/27/05 (9/28-10/7/05)	SSN-14 9/27/05 (9/28-10/7/05)	SSN-5 9/28/05 (9/29-10/7/05)	SSN-6 9/28/05 (9/29-10/7/05)	SSN-7 9/28/05 (9/29-10/7/05)	CQS-1 9/28/05 (9/29-10/7/05)	CQS-2 9/29/05 (9/30-10/7/05)	CQS-3 9/29/05 (9/30-10/7/05)	SPL-1 9/29/05 (9/30-10/7/05)
Pesticides															
Aldrin	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
BHC, alpha	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
BHC, beta	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
BHC delta	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
BHC, gamma	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
Chlordane (Total)	mg/kg			<0.032	<0.012	<0.017	<0.18	<0.18	<0.17	<0.18	<0.19	<0.14	<0.24	<0.036	<0.21
Chlordane, alpha	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
Chlordane, gamma	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
o,p-DDD	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
o,p-DDD	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
o,p- DDE	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
o,p- DDE	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
o,p-DDT	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
o,p-DDT	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
p,p-DDD	mg/kg	0.02	0.002	<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
p,p-DDE	mg/kg	0.027	0.0022	<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
p,p-DDT	mg/kg	0.007	0.001	<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
Dieldrin	mg/kg	0.008	0.00002	<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
Endosulfan I (alpha)	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
Endosulfan II (beta)	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
Endosulfan sulfate	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
Endrin	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
Endrin aldehyde	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
Heptachlor	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
Heptachlor Epoxide	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
Methoxychlor	mg/kg			<0.00064	<0.0046	<0.00066	<0.0035	<0.0036	<0.0033	<0.0037	<0.0037	<0.0029	<0.0047	<0.00073	<0.0042
Toxaphene	mg/kg			<0.064	<0.46	<0.067	<0.35	<0.36	<0.33	<0.37	<0.37	<0.29	<0.47	<0.073	<0.42
Aroclor 1016	mg/kg			<0.032	<0.23	<0.033	<0.18	<0.18	<0.42	<0.46	<0.46	<0.36	<0.24	<0.036	<0.21
Aroclor 1221	mg/kg			<0.032	<0.23	<0.033	<0.18	<0.18	<0.42	<0.46	<0.46	<0.36	<0.24	<0.036	<0.21
Aroclor 1232	mg/kg			<0.032	<0.23	<0.033	<0.18	<0.18	<0.42	<0.46	<0.46	<0.36	<0.24	<0.036	<0.21
Aroclor 1242	mg/kg			<0.032	<0.23	<0.033	<0.18	<0.18	<0.42	<0.46	<0.46	<0.36	<0.24	<0.036	<0.21
Aroclor 1248	mg/kg			<0.032	<0.23	<0.033	<0.18	<0.18	<0.42	<0.46	<0.46	<0.36	<0.24	<0.036	<0.21
Aroclor 1254	mg/kg			<0.032	<0.23	<0.033	<0.18	<0.18	<0.42	<0.46	<0.46	<0.36	<0.24	<0.036	<0.21
Aroclor 1260	mg/kg			<0.032	<0.23	<0.033	<0.18	<0.18	<0.42	<0.46	<0.46	<0.36	<0.24	<0.036	<0.21
Total PCB's	mg/kg			<0.032	<0.23	<0.033	<0.18	<0.18	<0.42	<0.46	<0.46	<0.36	<0.24	<0.036	<0.21
Butylins															
Dybutyltin	mg/kg			<0.0025	<0.0037	<0.0013	<0.0028	<0.0029	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Monobutyltin	mg/kg			<0.0025	<0.0037	<0.0013	<0.0028	<0.0029	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Tetrabutyltin	mg/kg			<0.0025	<0.0037	<0.0013	<0.0028	<0.0029	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Tributyltin	mg/kg			<0.0025	<0.0037	<0.0013	<0.0028	<0.0029	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Total Butyltins	mg/kg			<0.0025	<0.0037	<0.0013	<0.0028	<0.0029	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020

[1] Refer to Figure 1 for sample locations.

[2] ERM = Effects Range Mean; ERL = Effects Range Low.

[3] Blank = not applicable.

TABLE 4
SEDIMENT PESTICIDE AND BUTYLTIN RESULTS

Analyte	Units	ERM[2] mg/kg	ERL[2] mg/kg	Location[1] Date Sampled (Date Analyzed) SPL-2 9/29/05 (9/30-10/7/05)	SPL-3 9/29/05 (9/30-10/7/05)	SPL-4 9/29/05 (9/30-10/7/05)	SPL-5 9/30/05 (10/3-13/05)	SFB-1 9/30/05 (10/3-13/05)	SFB-2 9/30/05 (10/3-13/05)	SFB-3 9/30/05 (10/3-13/05)	DUP-1 9/23/05 (9/27-10/1/05) (Dup of PBG-2)	DUP-2 9/27/05 (9/28-10/7/05) (Dup of SSN-3)	DUP-3 9/30/05 (10/3-13/05) (Dup of SFB-2)	DUP-4 9/30/05 (10/3-13/05) (Dup of SFB-1)	9-21-RINSATE 9/21/05 (9/30/05)
Pesticides															
Aldrin	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
BHC, alpha	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
BHC, beta	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
BHC delta	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
BHC, gamma	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
Chlordane (Total)	mg/kg			<0.18	<0.24	<0.23	<0.47	<0.49	<0.41	<0.42	<0.18	<0.18	<0.41	<0.48	ND
Chlordane, alpha	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
Chlordane, gamma	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
o,p-DDD	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
o,p-DDD	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
o,p- DDE	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
o,p- DDE	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
o,p-DDT	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
o,p-DDT	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
p,p-DDD	mg/kg	0.02	0.002	<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
p,p-DDE	mg/kg	0.027	0.0022	<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
p,p-DDT	mg/kg	0.007	0.001	<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
Dieldrin	mg/kg	0.008	0.00002	<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
Endosulfan I (alpha)	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
Endosulfan II (beta)	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
Endosulfan sulfate	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
Endrin	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
Endrin aldehyde	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
Heptachlor	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
Heptachlor Epoxide	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
Methoxychlor	mg/kg			<0.0036	<0.0047	<0.0047	<0.0095	<0.0098	<0.0081	<0.0083	<0.0037	<0.0036	<0.0082	<0.0097	ND
Toxaphene	mg/kg			<0.36	<0.47	<0.47	<0.95	<0.98	<0.81	<0.83	<0.37	<0.36	<0.82	<0.97	ND
Aroclor 1016	mg/kg			<0.18	<0.24	<0.23	<0.47	<0.49	<0.41	<0.42	<0.18	<0.18	<0.41	<0.48	ND
Aroclor 1221	mg/kg			<0.18	<0.24	<0.23	<0.47	<0.49	<0.41	<0.42	<0.18	<0.18	<0.41	<0.48	ND
Aroclor 1232	mg/kg			<0.18	<0.24	<0.23	<0.47	<0.49	<0.41	<0.42	<0.18	<0.18	<0.41	<0.48	ND
Aroclor 1242	mg/kg			<0.18	<0.24	<0.23	<0.47	<0.49	<0.41	<0.42	<0.18	<0.18	<0.41	<0.48	ND
Aroclor 1248	mg/kg			<0.18	<0.24	<0.23	<0.47	<0.49	<0.41	<0.42	<0.18	<0.18	<0.41	<0.48	ND
Aroclor 1254	mg/kg			<0.18	<0.24	<0.23	<0.47	<0.49	<0.41	<0.42	<0.18	<0.18	<0.41	<0.48	ND
Aroclor 1260	mg/kg			<0.18	<0.24	<0.23	<0.47	<0.49	<0.41	<0.42	<0.18	<0.18	<0.41	<0.48	ND
Total PCB's	mg/kg			<0.18	<0.24	<0.23	<0.47	<0.49	<0.41	<0.42	<0.18	<0.18	<0.41	<0.48	ND
Butylins															
Dybutyltin	mg/kg			<0.0020	<0.0020	<0.0020	<0.0038	<0.0039	<0.0033	<0.0033	<0.0029	<0.0029	<0.0033	<0.0039	ND
Monobutyltin	mg/kg			<0.0020	<0.0020	<0.0020	<0.0038	<0.0039	<0.0033	<0.0033	<0.0029	<0.0029	<0.0033	<0.0039	ND
Tetrabutyltin	mg/kg			<0.0020	<0.0020	<0.0020	<0.0038	<0.0039	<0.0033	<0.0033	<0.0029	<0.0029	<0.0033	<0.0039	ND
Tributyltin	mg/kg			<0.0020	<0.0020	<0.0020	<0.0038	<0.0039	<0.0033	<0.0033	<0.0029	<0.0029	<0.0033	<0.0039	ND
Total Butyltins	mg/kg			<0.0020	<0.0020	<0.0020	<0.0038	<0.0039	<0.0033	<0.0033	<0.0029	<0.0029	<0.0033	<0.0039	ND

[1] Refer to Figure 1 for sample locations.

[2] ERM = Effects Range Mean; ERL = Effects Range Low.

[3] Blank = not applicable.

TABLE 5
SEDIMENT GRAIN SIZE RESULTS

Sample ID[1]/Depth	Grain size (%)					
	Course Gravel	Fine Gravel	Course Sand	Med. Sand	Fine Sand	Silt/Clay
PBG-1/2'-3'	0	0.1	1.2	6.9	62.6	29.2
PBG-1/4'-5'	0	0.8	1.1	15.8	81.9	0.4
PBG-2/0-1'	0	0	0.3	2.9	73.1	23.7
PBG-2/4'6"-5'6"	0	1.6	1.4	6.3	72.9	17.8
PBG-3/1'-2'	0	9.3	30.4	23.2	6.7	30.4
PBG-3/5'8"-6'8"	0	23.8	25.4	19.5	2.6	28.7
PBG-4/1'-2'	0	0	0.2	1.3	16.4	82.1
PBG-4/3'6"-4'6"	0	0	0.2	1.7	16.6	81.5
PPG-5/0-1'	0	2.4	4.7	10.8	71.6	10.5
PPG-5/4'-5'	0	2.3	2.6	7	53.8	34.3
NYE-1/1'-2'	0	0.7	1	32	59	7.3
NYE-1/7'6"-8'6"	0	0.1	0.1	1	10.2	88.6
NYE-1/14'-15'	0	0	0.1	2.7	6.6	90.6
NYE-2/1'-2'	0	0	0.2	36.4	62.8	0.6
NYE-2/7'-8'	0	0	0	29.6	70.3	0.1
NYE-2/12'4-13'4"	0	0	0.2	66.5	29.5	3.8
NYW-1/0'6"-1'6"	0	69.8	13.7	9.5	4	3
NYW-1/7'-8'	0	0.8	1.4	3.5	3.8	90.5
NYW-2/0'6"-1'6"	0	62.9	14.8	10.9	7.7	3.7
NYW-2/7'6"-8'6"	0	0.1	1.5	7.3	5.3	85.8
SSN-1/5'6"-6'6"	0	0	1.2	6.3	23.7	68.8
SSN-2/0'7"-1'7"	0	0.2	0.4	2.8	55.2	41.4
SSN-3/3'2"-4'2"	0	0	0.1	1	79.6	19.3
SSN-4/0'6"-1'6"	0	0	0	2	54.2	43.8
SSN-4/4'-5'	0	0	0.1	0.4	73.1	26.1
SSN-5/0'3"-1'4"	0	0.2	1.3	10.7	59.8	28
SSN-5/5'2"-6'2"	0	0	0.7	5.6	45	48.7
SSN-6/1'-2'	0	0	0.5	4	12.8	82.7
SSN-6/5'4"-6'4"	0	0	0	0.7	10.2	89.1
SSN-7/0'4"-1'5"	0	0.4	3.7	10.1	10.6	75.2
SSN-7/4'11"-5'11"	0	0	0.6	13.6	17.8	68
CQS-1/0'0"-1'0"	0	0.3	0.8	0.8	83.4	14.7
CQS-1/4'6"-5'6"	0	0	0.3	2.3	74.8	22.6
CQS-2//0'8"-1'8"	0	0	0	0.2	7.3	72.5
CQS-2/4'5"-5'5"	0	0	0	0.1	6.9	93
CQS-3/0'-1'	0	0	0.8	10.9	87.6	0.7
CQS-3/5'4"-6'4"	0	0	0.9	6.8	86.9	5.4
SPL-1/0'-1'	0	0	0	0.5	23.9	75.6
SPL-1/5'2"-6'2"	0	0	0.1	0.8	55.5	43.6
SPL-2/0'1"-1'0"	0	0	0	0.5	63.8	35.7
SPL-2/4'5"-5'5"	0	0	0.1	1.8	80.2	17.9
SPL-3/0'.8"-1'8"	0	0	0.6	3	8.7	87.7
SPL-3/5'1"-6'1"	0	0	0.6	8.7	56.4	34.3
SPL-4/1'1"-2'1"	0	0	0	0.8	5.3	93.9
SPL-4/5'3"-6'3"	0	0	1.8	4	10.3	83.9

TABLE 5
SEDIMENT GRAIN SIZE RESULTS

Sample ID[1]/Depth	Grain size (%)					
	Course Gravel	Fine Gravel	Course Sand	Med. Sand	Fine Sand	Silt/Clay
SPL-5/0'4"-1'4"	0	0	0.2	3.1	27.1	69.6
SPL-5/5'1"-6'1"	0	0	0.9	5.1	3	91
SFB-1/0'6"-1'6"	0	0	0.5	2.5	52.4	44.6
SFB-1/4'8"-5'8"	0	0	0.9	3.4	17.5	78.2
SFB-2/0'6"-1'6"	0	0	1.1	5.3	23.3	70.3
SFB-2/4'8"-5'8"	0	0	0.7	6.2	22.3	70.8
SFB-3/0'4"-1'4"	0	0	0.1	8.6	89.5	1.8
SFB-3/4'11"-5'11"	0	0	0.3	14.3	79.2	6.2

[1] Refer to Figure 1 for sample locations.

TABLE 6
RMP SEDIMENT SAMPLE DATA

Analyte	ERM[2]	ERL[2]	RMP Station ID/Date (All Units in mg/kg)									
			BD41 08/10/2001	BD31 08/20/2003	CB011S 08/20/2003	CB012S 08/21/2003	CB073S 08/08/2002	SPB010S 08/20/2003	SU003S 08/01/2002	SU010S 08/18/2003	SU008S 07/31/2002	SU007S 08/01/2002
Inorganics												
Arsenic	70	8.2	5.73	7.50	7.22	6.84	8.36	8.24	5.26	2.83	**11.51**	7.24
Cadmium	9.6	1.2	0.130	0.219	0.288	0.244	0.180	0.182	0.210	0.108	0.460	0.215
Chromium	370	81										
Copper	270	34	24.570	50.669	51.152	28.873	20.540	44.982	18.210	12.814	22.550	25.625
Lead	218	46.7	16.35	18.09	21.12	15.41	12.26	16.70	7.21	3.10	5.97	7.88
Mercury	0.71	0.15	**0.3783**	**0.2390**	**0.2560**	**0.1850**	0.1314	**0.2185**	0.0960	ND	0.2771	0.0696
Nickel	51.6	20.9	**60.43**	**88.40**	**87.86**	**71.99**	**61.22**	**79.83**	**57.58**	**56.02**	**154.32**	**67.91**
Selenium			0.129	0.265	0.259	0.220	0.139	0.248	0.124	0.041	0.583	0.237
Silver	3.7	1	0.055	ND	0.145	ND	0.080	0.092	ND	ND	0.340	ND
Zinc	410	150	80.7	127.3	129.9	88.5	79.6	114.6	60.6		49.3	68.5
Polyaromatic Hydrocarbons												
Acenaphthene	0.5	0.016	0.0014	0.0024	0.0071	0.0336	0.0299	0.0019	0.0010	ND	0.0092	ND
Acenaphthylene	0.64	0.044	0.0012	ND	0.0082	**0.0726**	0.0324	0.0019	ND	ND	0.0035	ND
Anthracene	1.1	0.0853	0.0031	0.0104	0.0196	**0.2410**	0.0777	0.0064	0.0018	ND	0.0176	ND
Benzo (a) Anthracene	1.6	0.261	0.0120	0.0170	0.0520	**0.5290**	0.2060	0.0125	0.0075	0.0007	0.0194	0.0031
Benzo (a) Pyrene	1.6	0.43	0.0109	0.0334	0.0876	**0.7550**	0.2930	0.0422	0.0156	0.0035	0.0247	0.0053
Benzo (b) Fluoranthene	3.6	3.6	0.0127	0.0270	0.0666	0.4360	0.1550	0.0334	0.0147	0.0041	0.0177	0.0063
Benzo (g,h,i) Perylene	0.72	0.72	0.0080	0.0324	0.0869	0.6230	0.2290	0.0380	0.0149	0.0015	0.0094	0.0058
Benzo (k) Fluoranthene	3.6	3.6	0.0046	0.0226	0.0616	0.4400	0.1580	0.0260	0.0124	0.0021	0.0128	0.0049
Chrysene	2.8	0.384	0.0157	0.0287	0.0603	0.5440	0.2120	0.0241	0.0111	ND	0.0231	0.0056
Dibenzo (a,h) Anthracene	0.26	0.0634	ND	0.0019	0.0079					ND		ND
Fluoranthene	5.1	0.6		0.0558	0.1360	1.4200	0.4470	0.0516	0.0261	0.0043	0.0958	0.0125
Fluorene	0.54	0.019	ND	0.0030	0.0112	0.0664	0.0203	0.0062	0.0023	ND	0.0263	0.0031
Indeno (1,2,3-cd) Pyrene	0.69	0.69	0.0135	0.0138	0.0591	0.4730	0.2390	0.0255	0.0124	ND	0.0059	0.0037
1-Methylnaphthalene	0.67	0.07	0.0023	0.0059	0.0078	0.0177	0.0094	0.0057	0.0021	ND	0.0090	0.0024
2-Methylnaphthalene	0.67	0.07	0.0042	0.0102	0.0135	0.0298	0.0130	0.0103	0.0026	ND	0.0131	0.0025
Naphthalene	2.1	0.16	0.0061	0.0241	0.0330	0.1200	0.0391	0.0240	0.0049		0.0407	0.0029
Phenanthrene	1.5	0.24	0.0137	0.0326	0.0850	**0.8210**	0.3280	0.0310		0.0025	0.1300	
Pyrene	2.6	0.665	0.0415	0.0676	0.1670	1.9000	0.5260	0.0614	0.0298	0.0051	0.0668	0.0126
Pesticides												
p,p-DDD	0.02	0.002	ND				ND		0.0003		ND	ND
p,p-DDE	0.027	0.0022	ND				ND		0.0004		ND	0.0003
p,p-DDT	0.007	0.001	ND				ND		ND			
Dieldrin	0.008	0.00002	ND				ND		ND		**0.0008**	ND
Total PCBs			ND									
Total PAHs			0.1769	0.4594	1.1078	9.3319	3.3564	0.4877	0.2114		0.6307	0.1832

[1] Refer to Figure 1 for RMP station locations.

[2] ERM = Effects Range Mean; ERL = Effects Range Low; bold = above ERL; **Bold, underline** = above ERM.

[3] Blank = not applicable.

TABLE 7
SEDIMENT QUALITY SUMMARY

Analyte	ERM[2] mg/kg	ERL[2] mg/kg	TBC Sampling Data		RMP Data Along Cable Alignment		
			Min	Max	Min	Max	Max without Sample CB012S
Inorganics							
Arsenic	70	8.2	3.8	**67**	2.83	**11.51**	**11.51**
Cadmium	9.6	1.2	0.19	0.44	0.11	0.46	0.46
Chromium	370	81	29	**100**	—[3]		
Copper	270	34	6.5	**69**	12.81	**51.15**	**51.15**
Lead	218	46.7	3	29	3.1	21.12	21.12
Mercury	0.71	0.15	0.025	**0.51**	ND	**0.38**	**0.38**
Nickel	51.6	20.9	**36**	**120**	56.02	**154.32**	**154.32**
Selenium			ND	1.1	0.04	0.58	0.58
Silver	3.7	1	0.032	0.36	ND	0.34	0.34
Zinc	410	150	22	**150**	49.3	129.9	129.9
Polyaromatic Hydrocarbons							
Acenaphthene	0.5	0.016	ND	ND	ND	**0.0336**	**0.0299**
Acenaphthylene	0.64	0.044	ND	ND	ND	**0.0726**	0.0324
Anthracene	1.1	0.0853	ND	ND	ND	**0.241**	0.0777
Benzo (a) Anthracene	1.6	0.261	ND	0.018	0.0007	**0.529**	0.206
Benzo (a) Pyrene	1.6	0.43	ND	0.027	0.0035	**0.755**	0.293
Benzo (b) Fluoranthene	3.6	3.6	ND	0.027	0.0041	0.436	0.155
Benzo (g,h,i) Perylene	0.72	0.72	ND	0.038	0.0015	0.623	0.229
Benzo (k) Fluoranthene	3.6	3.6	ND	0.019	0.0021	0.44	0.158
Chrysene	2.8	0.384	ND	0.022	ND	**0.544**	0.212
Dibenzo (a,h) Anthracene	0.26	0.0634	ND	ND	ND	0.0079	0.0079
Fluoranthene	5.1	0.6	ND	0.067	ND	**1.42**	0.447
Fluorene	0.54	0.019	ND	ND	ND	**0.0664**	0.0263
Indeno (1,2,3-cd) Pyrene	0.69	0.69	ND	0.025	ND	0.473	0.239
1-Methylnaphthalene	0.67	0.07	ND	ND	ND	0.0177	0.0094
2-Methylnaphthalene	0.67	0.07	ND	ND	ND	0.0298	0.0135
Naphthalene	2.1	0.16	ND	ND	0.0029	0.12	0.0407
Phenanthrene	1.5	0.24	ND	0.012	0.0025	**0.821**	0.328
Pyrene	2.6	0.665	ND	0.085	0.0051	**1.9**	0.526
Pesticides							
p,p-DDD	0.02	0.002	ND	ND	ND	0.0003	0.0003
p,p-DDE	0.027	0.0022	ND	ND	ND	0.0004	0.0004
p,p-DDT	0.007	0.001	ND	ND	ND	0	ND
Dieldrin	0.008	0.00002	ND	ND	ND	**0.0008**	**0.0008**
Total PCBs			ND	ND	ND	0	ND
Total PAHs					0.1769	9.3319	3.3564

[1] All data are reported in mg/kg.

[2] ERM = Effects Range Mean; ERL = Effects Range Low; **bold** = above ERL; **Bold, underline** = above ERM.

[3] Blank = not analyzed or, for ERMs/ERLs, not established.

0 0.5 1 1.5 2 Miles
0 500 1,000 1,500 2,000 2,500 Meters
0 4,000 8,000 Feet
1 inch equals 8,000 feet 1:96,000
NAD 1983 UTM Zone 10N

SAN PABLO BAY
SONOMA CO
MARIN CO
SOLANO CO
CONTRA COSTA CO
HAMILTON AIR FORCE BASE
CHINA CAMP STATE PARK
John F McInnis County Park
Pt Pinole Regional Shoreline
PT PINOLE REG SHORELINE
Richmond
San Quentin (State Prison)
Paradise Cay
Tiburon
Belvedere
Sausalito
GOLDEN GATE NAT REC AREA
GOLDEN GATE NAT RECREATION AREA
GOLDEN GATE BRIDGE (TOLL)
SAN FRANCISCO BAY
Treasure Island
Yerba Buena Island
Alcatraz Island
Rodeo
Pinole
Hercules
Oleum
Davis Pt
Lone Tree Point
Wilson Pt
Pinole Pt
Rincon Point
Alameda
Albany
Emeryville
Berkeley
Piedmont
OAKLAND BAY BRIDGE (TOLL)
SAN RAFAEL BRIDGE (TOLL)
RICHMOND

DS-9
DS-10
DS-11

CQS-3
SPL-1
SPL-2
SPL-3
SPL-4
SPL-5
SFB-1
SFB-2
SFB-3
BD41
SPB010S
BD31
CB011S
CB073S
CB077S
CB012S

31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

EXPANDED STUDY CORRIDOR TO ALLOW FLEXIBILITY FOR BART CROSSING
ALTERNATIVE SF CONVERTER STATION, MIRANT
115 kV PG&E POTRERO SUBSTATION (EXISTING)
ALTERNATIVE SF CONVERTER STATION, SHEEDY
PROPOSED 400 MW HIGH VOLTAGE DIRECT CURRENT CABLE ROUTE
ALTERNATIVE 400 MW HIGH VOLTAGE DIRECT CURRENT CABLE ROUTE
PROPOSED SF CONVERTER STATION, HWC

Sonoma County
Napa
Solano County
Marin County
Contra Costa County
San Francisco County
San Mateo County
Alameda County
Novato
Vallejo
Benicia
Pittsburg
Martinez
Concord
Antioch
Pinole
San Rafael
San Pablo
Richmond
Larkspur
Mill Valley
Walnut Creek
Albany
Berkeley
Piedmont
Oakland
San Francisco
Alameda
San Ramon
Daly City
San Leandro
San Lorenzo

Legend

- URS Sediment Samples
- RMP Stations
- *Proposed Direct Current Cable Route Mileposts*
- Mile/End Point
- *Proposed/Alternative Routes*
- Proposed 400 MW High Voltage Direct Current Cable Route
- Proposed 115 kV Alternating Current Cable Route (San Francisco)
- Alternate 400 MW High Voltage Direct Current Cable Route
- Proposed, Alternate or Existing Converter Stations
- Dashed Study Corridor: Width 500 m - 250 m Each Side of DC Routes within Water Body
- DS-# USACE Dredge Disposal Areas

Source: TEG, U.S. Geological Survey 1:100,000-scale topographic maps (National Geographic Seamless USGS Topographic Maps on CD-ROM, Powered by TOPO!).

T:\Trans_Bay_Cable_Project_EIR\deliverables\sediment_sampling_locations\Figure 1_Sediment_1_of_2.mxd 2-14-2006

TRANS BAY CABLE PROJECT EIR	Figure 1. SEDIMENT SAMPLE LOCATIONS	SHEET 1 OF 2 2006

PROPOSED 400 MW HIGH VOLTAGE DIRECT CURRENT CABLE ROUTE

ALTERNATIVE 400 MW HIGH VOLTAGE DIRECT CURRENT CABLE ROUTE

PG&E SUBSTATION (EXISTING)

ALTERNATIVE PITTSBURG CONVERTER STATION, MIRANT

ALTERNATIVE PITTSBURG CONVERTER STATION, WEST TENTH STREET - ALTERNATIVES 1 (E/W) & 2 (N/S)

PROPOSED PITTSBURG CONVERTER STATION, STD. OIL

PROPOSED 230 MW ALTERNATING CURRENT CABLE ROUTE

0 0.5 1 1.5 2 Miles
0 500 1,000 1,500 2,000 2,500 Meters
0 4,000 8,000 Feet
1 inch equals 8,000 feet 1:96,000
NAD 1983 UTM Zone 10N

Legend

- URS Sediment Samples
- RMP Stations

Proposed Direct Current Cable Route Mileposts

- Mile/End Point

Proposed/Alternative Routes

- Proposed 400 MW High Voltage Direct Current Cable Route
- Proposed 230 kV Alternating Current Cable Route (Pittsburg)
- Alternate 400 MW High Voltage Direct Current Cable Route
- Alternate 230 kV Alternating Current Cable Route (Pittsburg)
- Proposed, Alternate or Existing Converter Stations
- Dashed Study Corridor: Width 500 m - 250 m Each Side of DC Routes within Water Body
- DS-# USACE Dredge Disposal Areas

Source: TEG, U.S. Geological Survey 1:100,000-scale topographic maps (National Geographic Seamless USGS Topographic Maps on CD-ROM, Powered by TOPO!).

Sonoma County
Napa
Solano County
Marin County
Contra Costa County
San Francisco County
San Mateo County
Alameda County
Novato
Vallejo
Benicia
West Pittsburg
Pittsburg
Martinez
Antioch
Concord
Pinole
San Rafael
San Pablo
Richmond
Larkspar
Mill Valley
Walnut Creek
Albany
Berkeley
Piedmont
Oakland
San Francisco
Alameda
San Ramon
Daly City
San Leandro
San Lorenzo

TRANS BAY CABLE PROJECT EIR	Figure 1. SEDIMENT SAMPLE LOCATIONS	SHEET 2 OF 2 2006

T:\Trans_Bay_Cable_Project_EIR\deliverables\sediment_sampling_locations\Figure 1_Sediment_2_of_2.mxd 2-14-2006

APPENDIX A SEDIMENT BORING LOGS

This appendix presents the sediment boring logs. The boring logs are presented in order from Pittsburg to Potrero and the applicable sample locations are shown on Figure 1 in the main body of this report.

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: PBG-1

Subcontractor: TEG

Date Drilled:	9/21/05	**Latitude:**	38°02.530’	**Total Depth Cored:**	6’6”
Time Drilled:	1613	**Longitude:**	121°53.732’	**Total Recovery:**	5’
Boring Type:	Vibrocore	**Water Depth:**	22.7’	**Logged By:**	SEZ

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0			SP		Medium to fine grey sand, angular to subrounded
1					
2		PBG-1-GT 2’ - 3’			
3			SP/SC		Layers of coarse sand (SP) and fine silty sand (SC)
4		PBG-1-GT 4’ - 5’	SP		Medium to fine quartz sand with mica, angular to subrounded
5					
6		PBG-1 = Composite of remaining core			
7					
8					
9					
10					
11					
12					
13					
14					
15					

Log of Boring
PBG-1

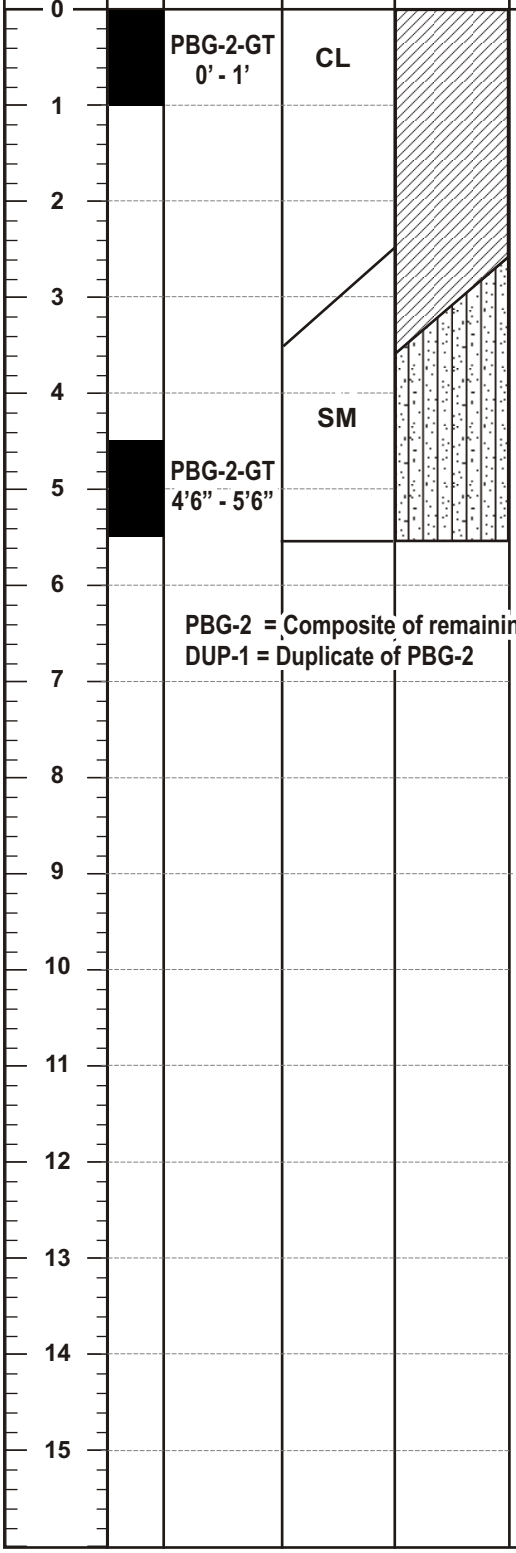
URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: PBG-2
Subcontractor: TEG

Date Drilled:	9/23/05	**Latitude:**	38°02.557’	**Total Depth Cored:**	6’6”
Time Drilled:	0756	**Longitude:**	121°53.670’	**Total Recovery:**	5’6”
Boring Type:	Vibrocore	**Water Depth:**	21’8”	**Logged By:**	SEZ



Description

Dark grey sandy silty clay
Grades to silty sand

Fine silty quartz sand subangular

PBG-2 = Composite of remaining core
DUP-1 = Duplicate of PBG-2

Log of Boring
PBG-2

URS

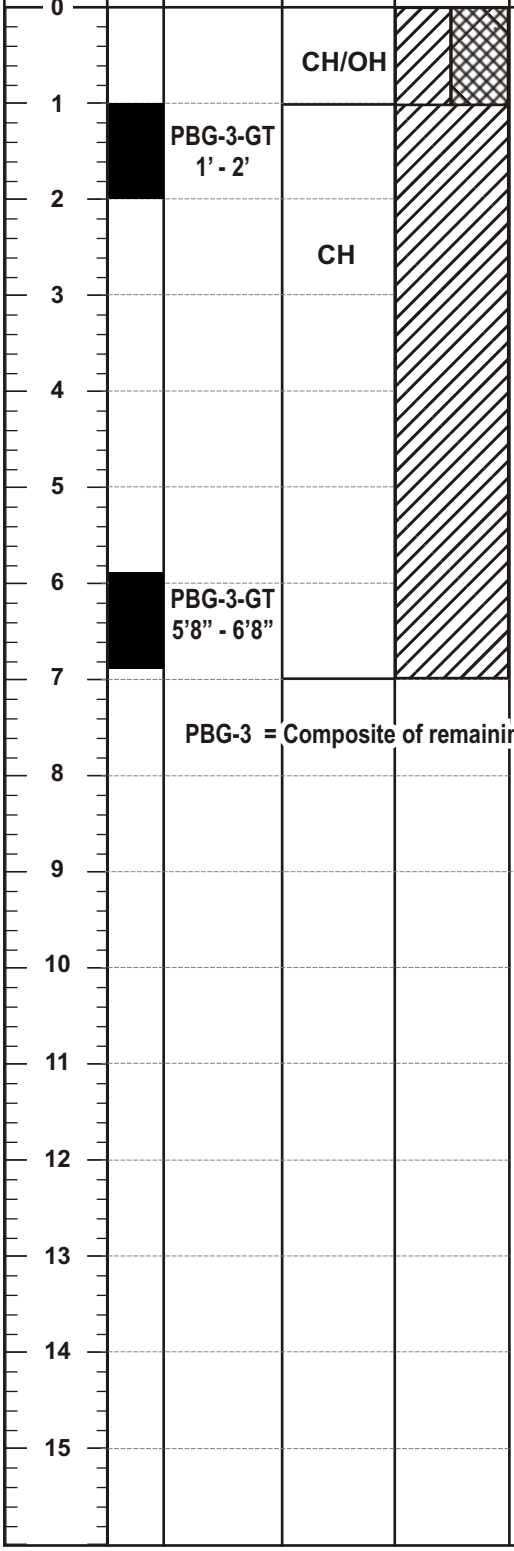
Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: PBG-3

Subcontractor: TEG

Date Drilled:	9/21/05	**Latitude:**	38°02.477’	**Total Depth Cored:**	7’
Time Drilled:	1412	**Longitude:**	121°53.936’	**Total Recovery:**	6’8”
Boring Type:	Vibrocore	**Water Depth:**	13’5”	**Logged By:**	SEZ



Description

Very soft dark brown clay (CH) with bivalve shells
High concentration of plant material (grasses)

Fine dark clay

Fibrous plant material increases with depth

PBG-3 = Composite of remaining core

Log of Boring
PBG-3

URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: PBG-4
Subcontractor: TEG

Date Drilled:	9/22/05	**Latitude:**	38°02.530’	**Total Depth Cored:**	6’6”
Time Drilled:	1506	**Longitude:**	122°54.216’	**Total Recovery:**	5’0”
Boring Type:	Vibrocore	**Water Depth:**	43.6’	**Logged By:**	SEZ

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0			SC		Dark brown silty sand, bivalve shells (2”)
1	■	PBG-4-GT 1’- 2’			
2			CH		Silty dark brown cohesive clay
3					
4	■	PBG-4-GT 3’6” - 4’6”			
5					
6		PBG-4 = Composite of remaining core			PID Reading: VOC ambient = 0.1 VOC mixing bucket = 0.5
7					
8					
9					
10					
11					
12					
13					
14					
15					

Log of Boring
PBG-4

URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: PBG-5
Subcontractor: TEG

Date Drilled:	9/23/05	**Latitude:**	38°02.574’	**Total Depth Cored:**	6’6”
Time Drilled:	0909	**Longitude:**	121°53.333’	**Total Recovery:**	5’2”
Boring Type:	Vibrocore	**Water Depth:**	20’	**Logged By:**	SEZ

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0		PBG-5-GT 0’ - 1’	Pt/CH		Top very peaty (50% peat)
1					Grades to 90% peat with 1/4”-1/2” sand stringers, numerous shell fragments
2			Pt		
3					
4		PBG-5-GT 4’ - 5’			
5					
6					PBG-5 = Composite of remaining core
7					
8					
9					
10					
11					
12					
13					
14					
15					

Log of Boring
PBG-5

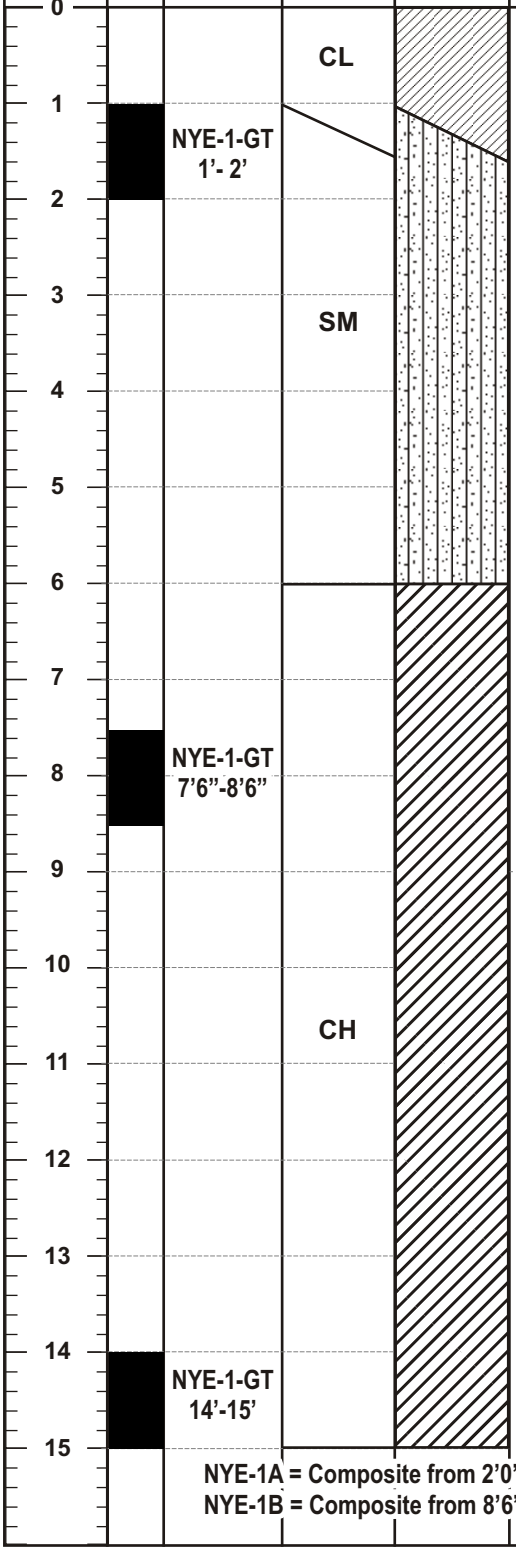
URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: NYE-1
Subcontractor: TEG

Date Drilled:	9/23/05	**Latitude:**	38°01.703’	**Total Depth Cored:**	15’6”
Time Drilled:	1416	**Longitude:**	121°50.819’	**Total Recovery:**	15’0”
Boring Type:	Vibrocore	**Water Depth:**	52’	**Logged By:**	SEZ



Description

Dark grey/brown sandy silt with mica flakes, bark and wood pieces (1.5”) and some peat

Dark grey silty quartz sand
Subangular shell fragments

Dark grey cohesive clay with minor amounts of sand and silt

Same as above, but slightly softer

NYE-1A = Composite from 2’0” to 7’6”
NYE-1B = Composite from 8’6” to 14’0”

Log of Boring NYE-1

URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: NYE-2

Subcontractor: TEG

Date Drilled:	9/27/05	**Latitude:**	38°01.778’	**Total Depth Cored:**	15’6”
Time Drilled:	1431	**Longitude:**	121°50.898’	**Total Recovery:**	15’4”
Boring Type:	Vibrocore	**Water Depth:**	36.5’	**Logged By:**	SEZ

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0			SP		Medium to coarse dark grey quartz sand subrounded
1	■	NYE-2-GT 1’- 2’			
2	■				
3					
4					Brown to grey color; some sand
5					
6					
7	■	NYE-2-GT 7’-8’			
8	■				
9					Grades to darker grey; same sand
10					
11					
12					
13	■	NYE-2-GT 12’4”-13’4”			
14			CL		Sandy silty clay with abundant wood fragments (twigs and pieces up to 1” long)
15			SP		

Log of Boring NYE-2

NYE-2A = Composite from 0’ to 1’ & 2’ to 7’
NYE-2B = Composite from 8’ to 12’4” & 13’4” to 15’4”

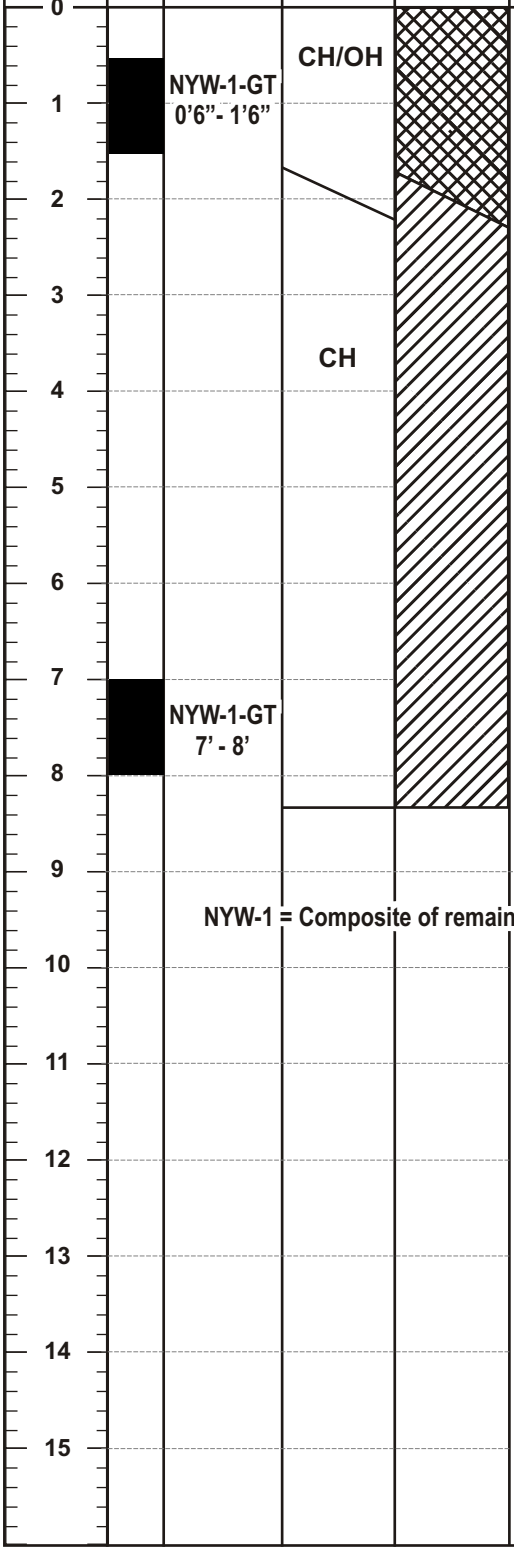
URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: NYW-1
Subcontractor: TEG

Date Drilled:	9/26/05	**Latitude:**	38°02.677’	**Total Depth Cored:**	15’6”
Time Drilled:	1250	**Longitude:**	121°53.187’	**Total Recovery:**	8’6”
Boring Type:	Vibrocore	**Water Depth:**	39.3’	**Logged By:**	GAR



Description

Grey to dark grey fat clay
Abundant organics

Decrease in organic matter; clay light grey

Thin sand stringers

NYW-1 = Composite of remaining core

Log of Boring
NYW-1

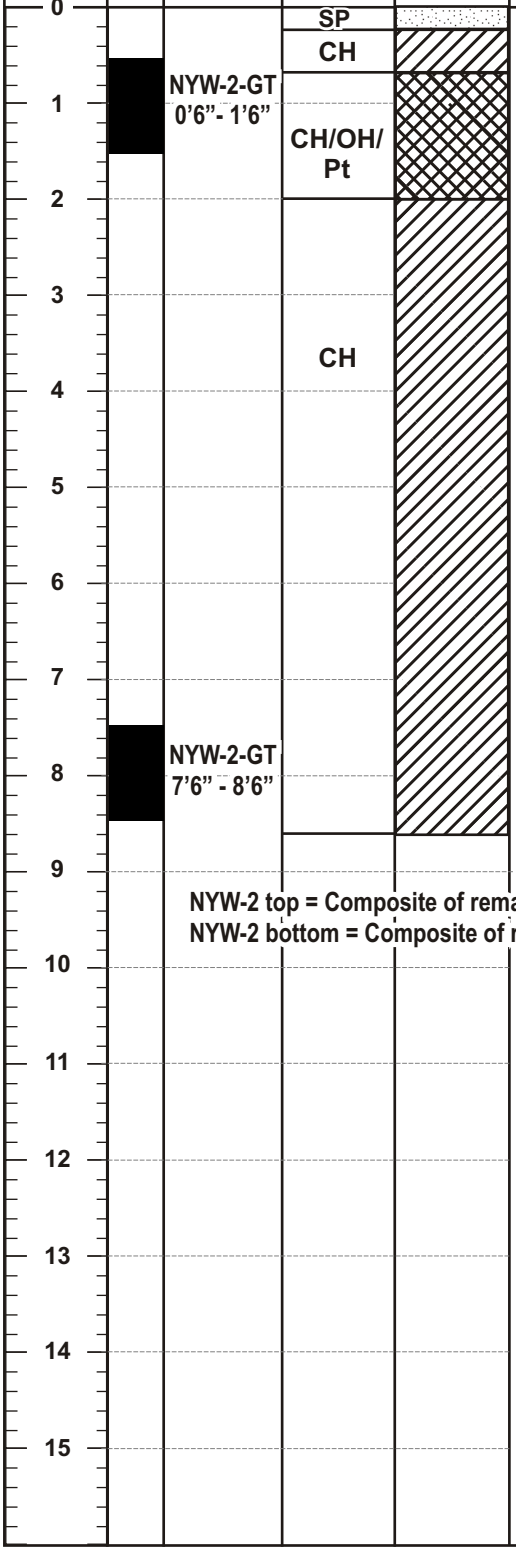
URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: NYW-2
Subcontractor: TEG

Date Drilled:	9/26/05	**Latitude:**	38°02.648’	**Total Depth Cored:**	15’6”
Time Drilled:	1400	**Longitude:**	121°53.291’	**Total Recovery:**	8’10”
Boring Type:	Vibrocore	**Water Depth:**	40’	**Logged By:**	GAR



Description

Fine-grained angular grey sand with shell fragments

3”-10”: Fat clay grey, soft with pockets of organics

Soft dark grey to black clay with abundant organics, layered
Trace of shells

Soft grey fat clay with shell fragments, stringers of fine black sand, layers of organic material

NYW-2 top = Composite of remaining core from 0’ to 4’5”
NYW-2 bottom = Composite of remaining core from 4’5” to 7’6”

Log of Boring
NYW-2

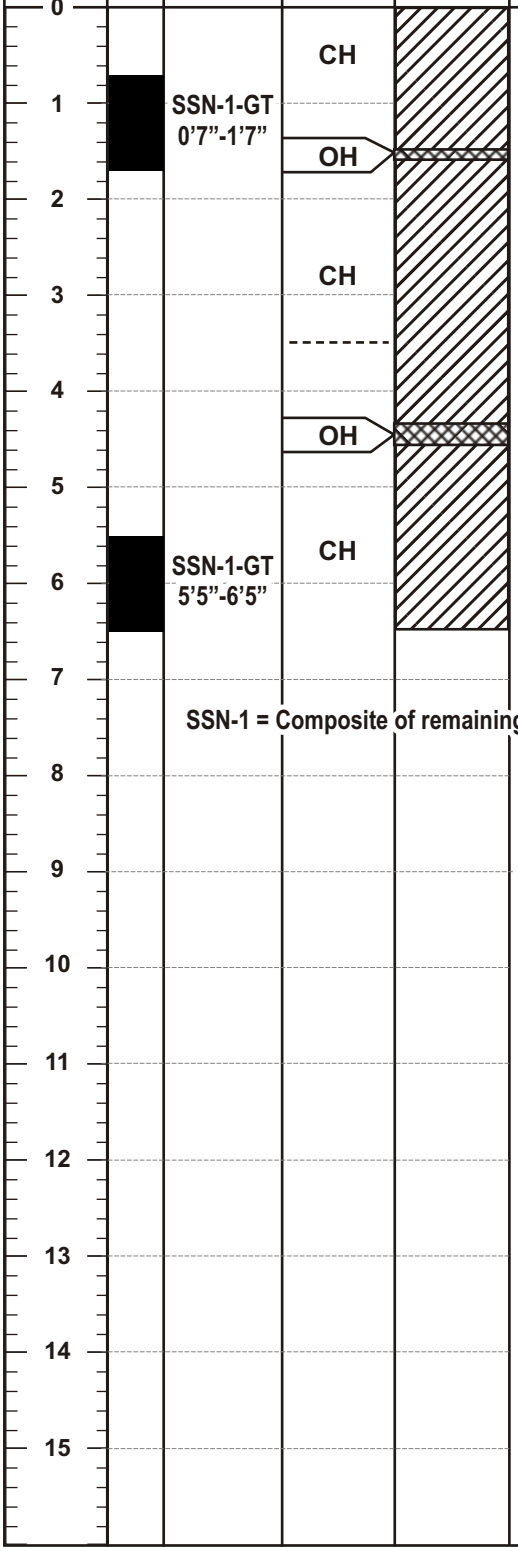
URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SSN-1
Subcontractor: TEG

Date Drilled:	9/21/05	**Latitude:**	38°02.980’	**Total Depth Cored:**	7’
Time Drilled:	1009	**Longitude:**	121°51.864’	**Total Recovery:**	6’5”
Boring Type:	Vibrocore	**Water Depth:**	17.6’	**Logged By:**	SEZ



Description

Very soft dark grey/blue silty clay

Patches of darker siltier clay with odor of H_2S

Fragments of wood and charcoal

Dark organic-rich layer, odor of H_2S

Firmer dark grey/blue silty clay

SSN-1 = Composite of remaining core

Log of Boring SSN-1

URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SSN-2

Subcontractor: TEG

Date Drilled:	**Latitude:**	**Total Depth Cored:**	6’6”’
Time Drilled:	**Longitude:**	**Total Recovery:**	1’5”
Boring Type:	**Water Depth:**	**Logged By:**	SEZ

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0			CH/SC		After multiple failed attempts to recover sediment, two successive attempts recovered enough sediment to composite for chemical analysis.

Location:	SSN-2	SSN-2B
Time Drilled:	1350	1410
Latitude:	38°02.765’	38°02.707’
Longitude:	121°55.874’	121°55.828’
Water Depth:	60.7’	56.7’
Recovery:	~7”	7”-8”
	Blue/grey silty clay, very cohesive	Medium-grained sand with dark grey clay and bivalves (1/4”) and plant material

SSN-2 = Composite of recovered sediment from locations SSN-2 and SSN-2B

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Log of Boring SSN-2

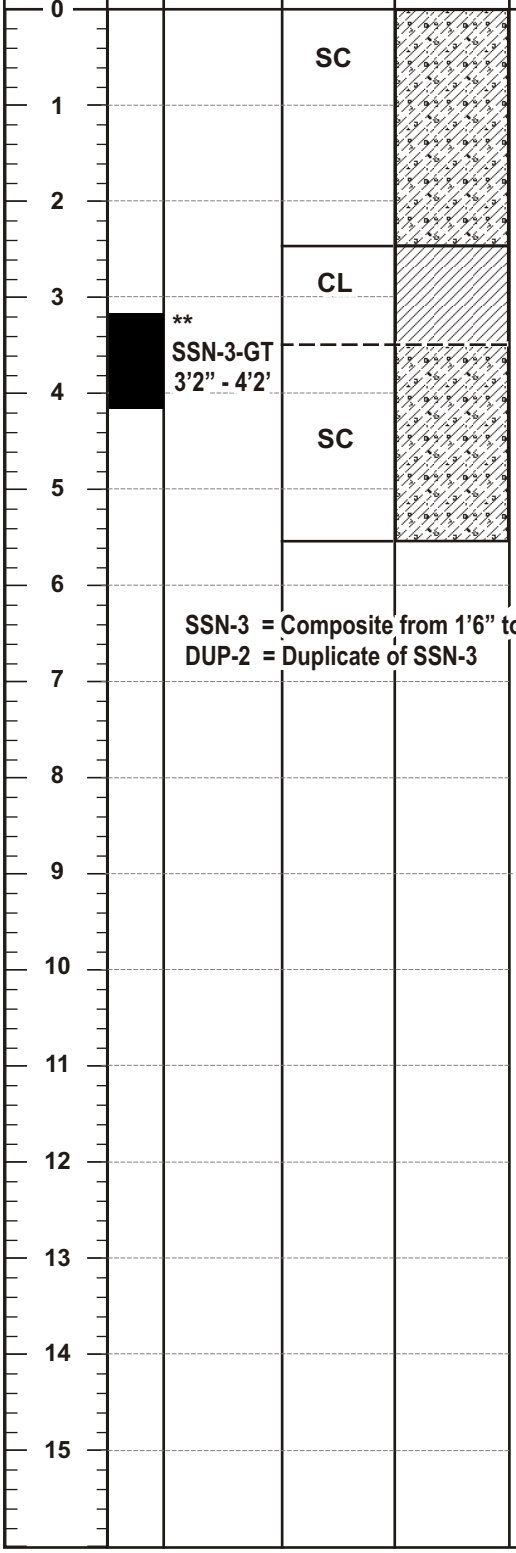
URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SSN-3
Subcontractor: TEG

Date Drilled:	9/27/05	**Latitude:**	38°03.733’	**Total Depth Cored:**	7’
Time Drilled:	0902	**Longitude:**	121°57.931’	**Total Recovery:**	7’
Boring Type:	Vibrocore	**Water Depth:**	26’	**Logged By:**	SEZ



Description

Dark grey fine silty sand
Mica flakes
Bivalve shells (1/4”)

Silty clay with fine silty sand

*

Dark grey fine silty sand

SSN-3 = Composite from 1’6” to 4’0”
DUP-2 = Duplicate of SSN-3

* Contact between lithologies was not visible through geotech core sleeve.

** Most of the core was disturbed. The least disturbed section was sampled for geotechnical analysis.

Log of Boring
SSN-3

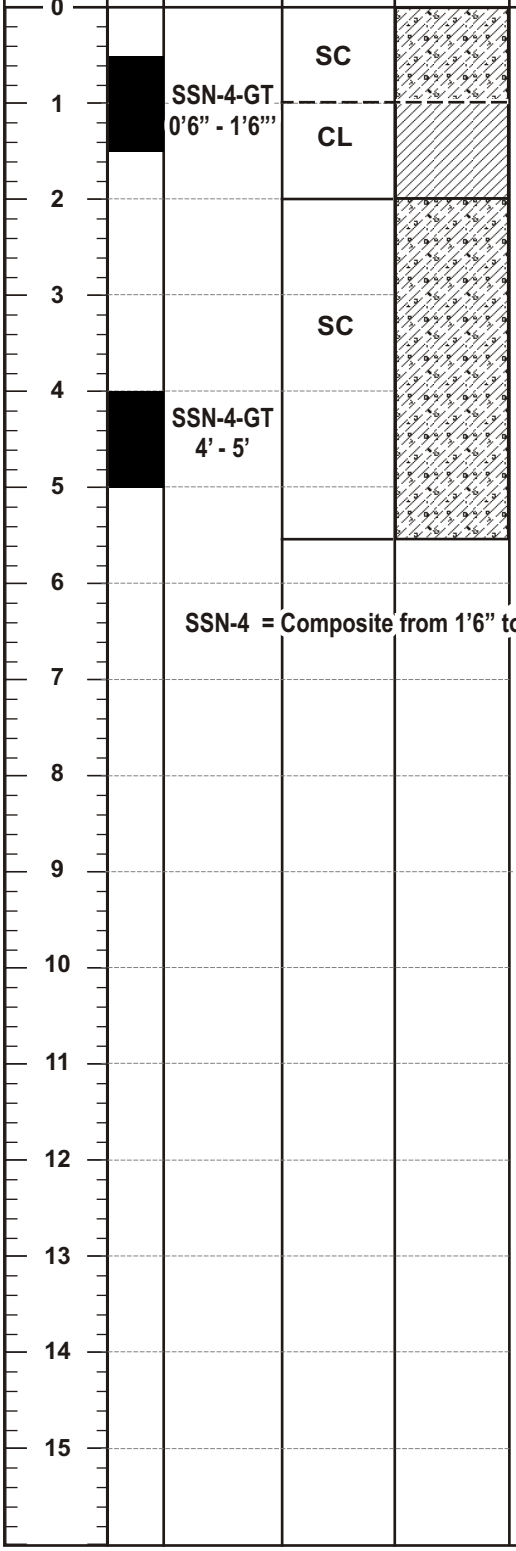
URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SSN-4
Subcontractor: TEG

Date Drilled:	9/27/05	**Latitude:**	38°04.415’	**Total Depth Cored:**	6’6”
Time Drilled:	1047	**Longitude:**	122°00.232’	**Total Recovery:**	5’6”
Boring Type:	Vibrocore	**Water Depth:**	28’3”	**Logged By:**	SEZ



Description

Fine-grained silty sand, dark grey
Contains fish bones and bivalve shells

*

Non-cohesive dark grey silty clay

Same sand as above with thin clay layers (<1/4” every 4”-6”)

Increasing clay content with depth

SSN-4 = Composite from 1’6” to 4’0”

* Contact between lithologies was not visible through geotech core sleeve.

Log of Boring
SSN-4

URS

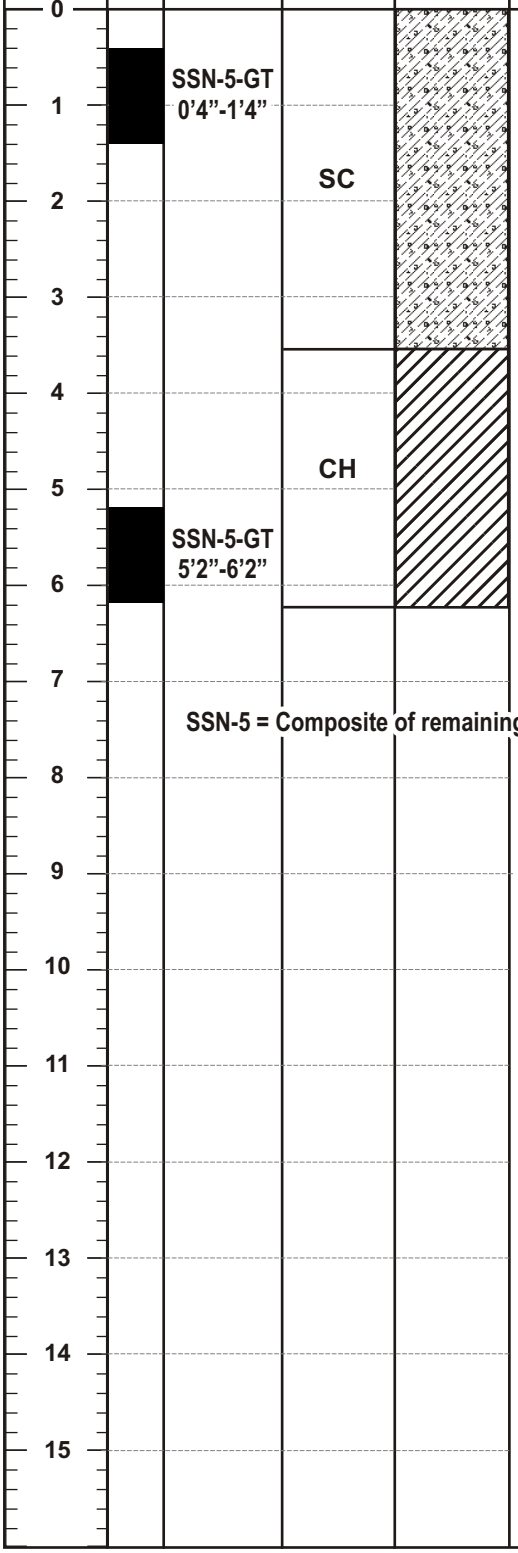
Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SSN-5

Subcontractor: TEG

Date Drilled:	9/28/05	**Latitude:**	38°04.806’	**Total Depth Cored:**	7’
Time Drilled:	0801	**Longitude:**	122°02.460’	**Total Recovery:**	6’2”
Boring Type:	Vibrocore	**Water Depth:**	19.1’	**Logged By:**	SEZ



Description

Medium-grained dark grey sand with silt

Thin layers of silty clay and sand (1/8” - 1/4” thick)

Same sand

Very dark grey clay with minor amounts of sand, PID reading for VOC = ambient

Grades to lighter grey

SSN-5 = Composite of remaining core

Log of Boring SSN-5

URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SSN-6

Subcontractor: TEG

Date Drilled:	9/28/05	**Latitude:**	38°04.480’	**Total Depth Cored:**	7’
Time Drilled:	0925	**Longitude:**	122°05.182’	**Total Recovery:**	6’7”
Boring Type:	Vibrocore	**Water Depth:**	16.7’	**Logged By:**	SEZ

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0			SM		Fine grey sand with silt and clay, odor of H_2S
1		SSN-6-GT 1’ - 2’	CH		Silty dark dray cohesive clay, slight petroleum odor
2					
3			SC/SM		Altering layers of fine sand (~4” thick) with fine silty sand layers (<1/4” thick)
4					
5			CH		Very dark grey cohesive clay, petroleum odor
6		SSN-6-GT 5’4” - 6’4”			
7					
8		SSN-6 = Composite of remaining core			
9					
10					
11					
12					
13					
14					
15					

Log of Boring
SSN-6

URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SSN-7

Subcontractor: TEG

Date Drilled:	9/28/05	**Latitude:**	38°03.080’	**Total Depth Cored:**	7’
Time Drilled:	1313	**Longitude:**	122°06.890’	**Total Recovery:**	6’5”
Boring Type:	Vibrocore	**Water Depth:**	40’	**Logged By:**	SEZ

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0					
1		SSN-7-GT 0’5”-1’5”	CH		Dark grey cohesive silty clay, 1/4”-1/2” bivalves near top
2					
3			CH/SM		Thin stringers of sand (SM)
4					1/2” layer of coarse silty sand
5		SSN-7-GT 4’11”-5’11”	CH		Dark grey silty clay
6					
7		SSN-7 = Composite of remaining core			
8					
9					
10					
11					
12					
13					
14					
15					

Log of Boring SSN-7

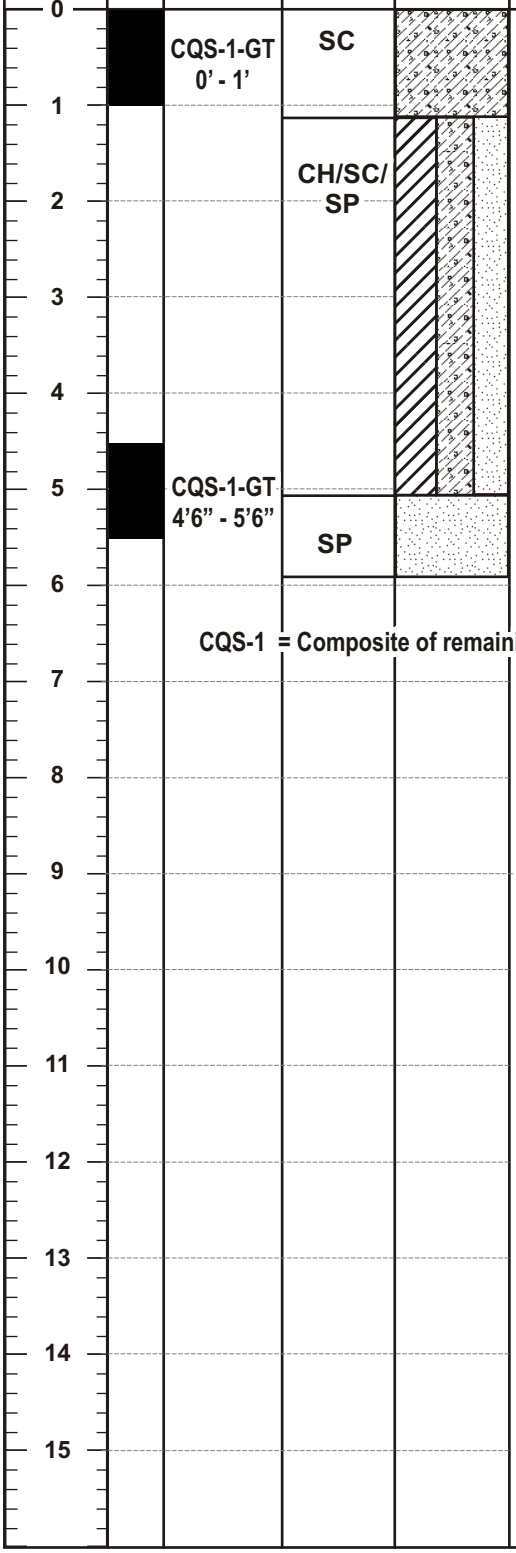
URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: CQS-1
Subcontractor: TEG

Date Drilled:	9/28/05	**Latitude:**	38°01.905’	**Total Depth Cored:**	6’6”
Time Drilled:	1450	**Longitude:**	122°08.318’	**Total Recovery:**	5’11”
Boring Type:	Vibrocore	**Water Depth:**	56.3’	**Logged By:**	SEZ



Description

Silty fine dark grey sand with bivalves up to 1/2”

Interbedded dark grey clay (CH) with dark grey silty sand (SC) and sand (SP)
Beds 1/4”-1/2”

Same as above
Beds 1/2” - 1-1/4”

Medium dark grey sand

CQS-1 = Composite of remaining core

Log of Boring
CQS-1

URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: CQS-2
Subcontractor: TEG

Date Drilled:	9/29/05	**Latitude:**	38°02.438’	**Total Depth Cored:**	6’6”
Time Drilled:	0738	**Longitude:**	122°10.430’	**Total Recovery:**	5’11”
Boring Type:	Vibrocore	**Water Depth:**	85.4’	**Logged By:**	JCQ/SEZ

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0					
1		CQS-2-GT 0’8”-1’8”	CL		Clay with fine sand and silt
2					
3			Pt		Thin layer of black peat
4			CL		Same clay as above, Stiffer with depth
5		CQS-2-GT 4’5”-5’5”			
6					
7		CQS-2 = Composite of remaining core			
8					
9					
10					
11					
12					
13					
14					
15					

Log of Boring CQS-2

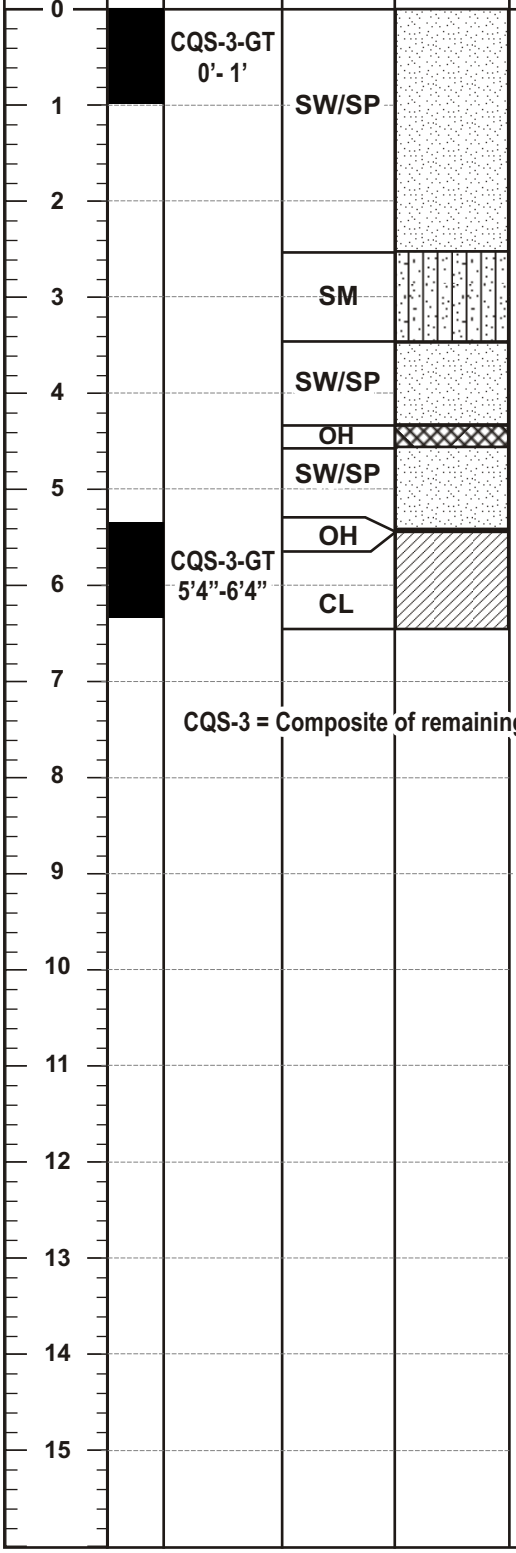
URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: CQS-3
Subcontractor: TEG

Date Drilled:	9/29/05	**Latitude:**	38°03.806’	**Total Depth Cored:**	6’6”
Time Drilled:	0837	**Longitude:**	122°13.257’	**Total Recovery:**	6’4”
Boring Type:	Vibrocore	**Water Depth:**	91.3’	**Logged By:**	JCQ/SEZ



Description

- Fine to medium-grained sand, Dark brown/grey subangular
- Medium to coarse darker sand with clay and wood pieces up to 1.5”
- Same sand as above with more mica
- Black organic layer with charred wood pieces up to 1/4”
- Same sand as above
- Black organic layer
- Silty clay

Log of Boring CQS-3

URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SPL-1
Subcontractor: TEG

Date Drilled:	9/29/05	**Latitude:**	38°03.442’	**Total Depth Cored:**	7’
Time Drilled:	0943	**Longitude:**	122°16.200’	**Total Recovery:**	6’8”
Boring Type:	Vibrocore	**Water Depth:**	47.7’	**Logged By:**	JCQ/SEZ

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0		SPL-1-GT 0’ - 1’	CH		Dark grey/green semi-cohesive clay with streaks of black organic matter (OH), slight odor of H_2S
1					
2					
3					Dark grey/green clay
4					
5		SPL-2-GT 5’2” - 6’2”	CH/SM		Interlayered with sand layers 1/8”-1/4” thick (SM)
6					
7					
8		SPL-1 = Composite of remaining core			
9					
10					
11					
12					
13					
14					
15					

Log of Boring SPL-1

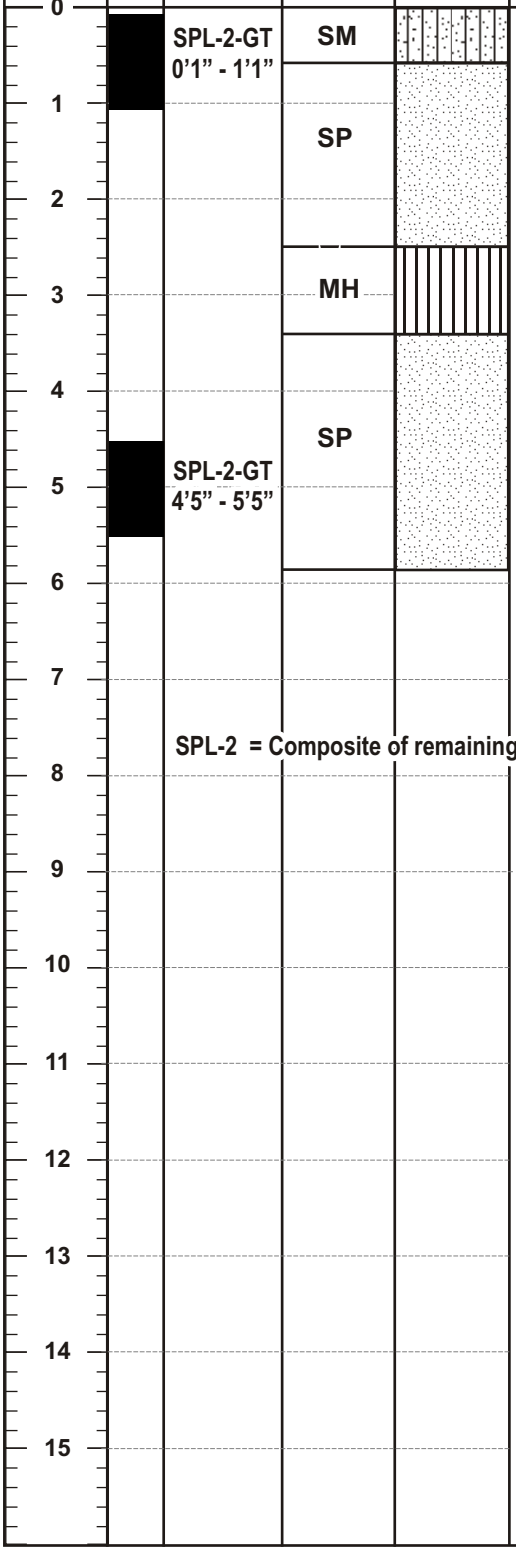
URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SPL-2
Subcontractor: TEG

Date Drilled:	9/29/05	**Latitude:**	38°02.958’	**Total Depth Cored:**	6’6”
Time Drilled:	1254	**Longitude:**	122°18.855’	**Total Recovery:**	5’11”
Boring Type:	Vibrocore	**Water Depth:**	32.7’	**Logged By:**	JCQ/SEZ



Description

Very fine silty muddy sand; dark grey

Medium to fine dark grey sand coarsening upward

Semi-cohesive sandy clay, dark grey

Fine sand with clay lenses

SPL-2 = Composite of remaining core

Log of Boring SPL-2

URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SPL-3
Subcontractor: TEG

Date Drilled:	9/29/05	**Latitude:**	38°02.185’	**Total Depth Cored:**	7’
Time Drilled:	1235	**Longitude:**	122°21.135’	**Total Recovery:**	6’7”
Boring Type:	Vibrocore	**Water Depth:**	31.8’	**Logged By:**	JCQ/GAR

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0			CH		Soft gray silty clay with trace sand
1	■	SPL-3-GT 0’8” - 1’8”			
2			SP		Fine grey sand, loose, with shell fragments
3			CH		Clay with trace sand and sand lenses
4			SP		Same sand as above, with whole shells
5			CH		Same clay as above
6	■	SPL-3-GT 5’1” - 6’1”			
7					
8		SPL-3 = Composite of remaining core			
9					
10					
11					
12					
13					
14					
15					

Log of Boring
SPL-3

URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SPL-4
Subcontractor: TEG

Date Drilled:	9/29/05	**Latitude:**	38°00.949’	**Total Depth Cored:**	7’
Time Drilled:	1413	**Longitude:**	122°24.106’	**Total Recovery:**	6’9”
Boring Type:	Vibrocore	**Water Depth:**	47.7’	**Logged By:**	JCQ/SEZ

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0			CH		Silty dark grey clay
1					
		SPL-4-GT 1’1” - 2’1”			
2					
3					Layer of organic matter and small wood pieces
4			SP		Fine dark grey sand
5			CH		Same clay as above
		SPL-4-GT 5’3” - 6’3”			
6					
7					
		SPL-4 = Composite of remaining core			
8					
9					
10					
11					
12					
13					
14					
15					

Log of Boring SPL-4

URS

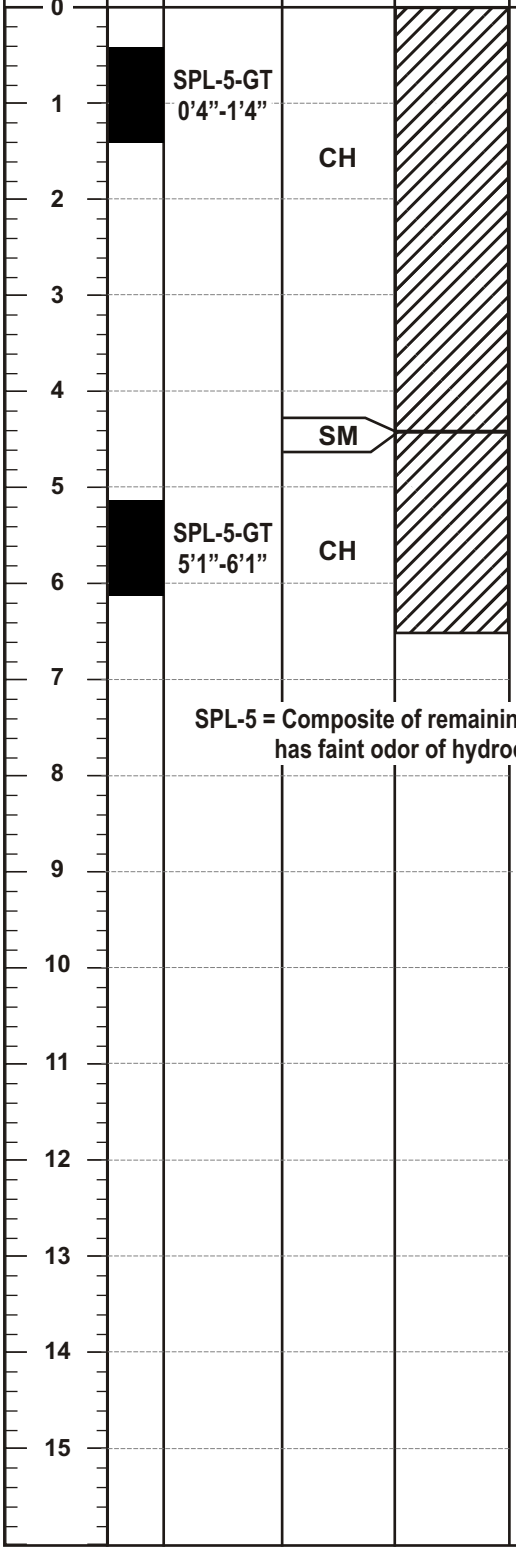
Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SPL-5

Subcontractor: TEG

Date Drilled:	9/30/05	**Latitude:**	37°59.742’	**Total Depth Cored:**	7’
Time Drilled:	1235	**Longitude:**	122°25.599’	**Total Recovery:**	6’7”
Boring Type:	Vibrocore	**Water Depth:**	49’	**Logged By:**	SEZ



Description

Very soft dark grey silty clay with some fine sand, live spiny clam (1.5”); firmer with depth

Thin layer of fine silty sand and shell fragments

Same clay as above, but less sand

SPL-5 = Composite of remaining core - has faint odor of hydrocarbons

Log of Boring SPL-5

URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SFB-1
Subcontractor: TEG

Date Drilled:	9/30/05	**Latitude:**	37°57.251’	**Total Depth Cored:**	6’6”
Time Drilled:	0845	**Longitude:**	122°26.930’	**Total Recovery:**	6’2”
Boring Type:	Vibrocore	**Water Depth:**	62.2’	**Logged By:**	SEZ

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0			CL		Very soft dark grey sandy clay
1		SFB-1-GT 0’6”- 1’6”			
2					
3			CH		Silty dark grey clay Firmer with depth Some very fine sand
4					
5		SFB-1-GT 4’8” - 5’8”			
6					
7		SFB-1 = Composite of remaining core DUP-4 = Duplicate of SFB-1			
8					
9					
10					
11					
12					
13					
14					
15					

Log of Boring
SFB-1

URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SFB-2
Subcontractor: TEG

Date Drilled:	9/30/05	**Latitude:**	37°55.846’	**Total Depth Cored:**	6’6”
Time Drilled:	0751	**Longitude:**	122°27.033’	**Total Recovery:**	6’2”
Boring Type:	Vibrocore	**Water Depth:**	44.5’	**Logged By:**	SEZ

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0			CH		Dark grey silty clay with shell fragments
1		SFB-2-GT 0’6”- 1’6”			
2			CL		Dark grey silty sandy clay with shell fragments
3			SM		Silty fine dark sand
4			SC		Silty sand with clay and shell fragments
			CL		Silty sandy clay
5		SFB-2-GT 4’8” - 5’8”	CH		Soft silty dark grey clay
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

SFB-2 = Composite of remaining core
DUP-3 = Duplicate of SFB-2

Log of Boring SFB-2

URS

Trans Bay Cable Project

Location: San Francisco Bay

Log of Boring: SFB-3
Subcontractor: TEG

Date Drilled:	9/30/05	**Latitude:**	37°53.550’	**Total Depth Cored:**	7’
Time Drilled:	1338	**Longitude:**	122°26.401’	**Total Recovery:**	6’9”
Boring Type:	Vibrocore	**Water Depth:**	71.3’	**Logged By:**	SEZ

Depth (Feet bgs)	Sample Interval	Sample Name	Soil Class	Graphic Log	Description
0–1		SFB-3-GT 0’4”- 1’4”	SW		Dark grey silty sand
1–3			CL		Sandy silty dark grey clay
3–4			ML		Dark grey sand, silt, and clay
4–5			CH		Silty dark grey clay, cohesive
4–7		SFB-3-GT 4’11” - 5’11”	SW/CH		Interbedded fine dark grey and (SW) and silty clay (CH)
7–8		SFB-3 = Composite of remaining core			

Log of Boring SFB-3

URS

Laboratory Quality Assurance/Quality Control (Sediments)
McCampbell Analytical, Inc, Pacheco, CA

B.1 METALS

This section summarizes the results of the QA/QC review of arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc analyses by EPA Method 6020A.

Holding Time Review. All samples were analyzed within the 180-day holding time (28 days for mercury).

Blank Review. The equipment rinsate blank, 9-21-Rinsate, contained the following metals at the concentrations shown in the table below:

Metal	Concentration (µg/L)
Arsenic	2.5
Chromium	2.7
Copper	6.4
Lead	2.1
Mercury	0.016
Nickel	3.3
Zinc	12

The concentrations of the metals in the sediment samples do not exceed regulatory limits (with the exception of arsenic, which is found naturally at elevated levels in San Francisco Bay as discussed in the main text). In addition, based on the relatively low concentrations of these metals in the rinsate blank as well as the sensitivity of the method, the blank results would have no more than a negligible effect on the sample results. Therefore, the reported concentrations for the samples associated with this blank were not changed. Rinseate is an aqueous solution and because the blank results are in aqueous units (ug/L), they cannot be compared directly with the metal concentrations in the sediment samples which are in (dry weight mg/Kg). The final analytical results are also adjusted in each sample for both the amount of solid sample used for the analysis and the the moisture content. Such a comparison would also have to include concentrations in the digestate. Raw laboratory data required for such an analysis is not generally included in the laboratory data package.

Matrix Spikes (MS). The only project sample that was spiked was NYW-2-Bottom. The laboratory determined that, since the sample concentration exceeded the spiking concentration for copper, cadmium and nickel, recovery and relative percent differences were not required to be calculated. However, since the convention is a factor greater than 4:1 between the sample concentration and the spiking concentration, it was determined that the

laboratory did not demonstrate its ability to recover these metals from this matrix. As a result, in all the samples in this work group, NYW-2-Top, NYW-1-Bottom, NYW-2-Top, and NYW-2-Bottom, reported concentrations were flagged "J", estimated. For all other metals the percent recoveries and the (relative percent difference) (RPD) between recoveries met QC criteria.

Laboratory Control Samples (LCS). All LCS recoveries were within the QC acceptance range.

Field Duplicate Sample Review. Samples PGB-2 and DUP-1; SSN-2 and DUP2; DUPE 3 (DUP-3) and SFB-2; DUPE 4 (DUP-4) and SFB-1, were sets of field duplicates. No discrepancies between reported results were observed.

Reporting Limits and Dilutions. In the case of samples SSN-1, PGB-1, and PGB-3 the high moisture content made it impossible to attain the desired MDLs for selenium and zinc. In the case of sample PGB-3, the moisture content was higher and the required MDLs could not be attained for selenium, zinc, cadmium, mercury and silver.

Concentrations above the method detection limit (MDL), but below the reporting limit (RL), were flagged "J," estimated.

B.2 SELENIUM

This section summarizes the results of the QA/QC review of the EPA Method 7010 for selenium.

Holding Time Review. The samples were analyzed within the analysis holding time (180 days).

Blank Review. Selenium was not reported in the rinsate blank, 9-21-Rinsate. Method blanks did not contain selenium.

Matrix Spikes and Duplicates (MS/MSD). Samples CQS-1 and PGB-3 were spiked for the MS/MSD (defined above) for selenium. All percent recoveries and RPDs between the percent recoveries met QC criteria.

Laboratory Control Samples (LCS). Selenium was recovered within the QC acceptance criteria for all work groups.

Field Duplicate Sample Review. No discrepancies between reported results for field duplicates were observed.

Reporting Limits and Dilutions. No dilutions were required for any samples.

B.3 POLYAROMATIC HYDROCARBONS (PAHs)

This section summarizes the results of the QA/QC review of the EPA Method 8270D Selective Ion Monitoring (SIM) for PAHs.

Holding Time Review. All samples were extracted within the 7-day holding time and analyzed within the 40 day holding time.

Equipment Blanks and Method Blanks. None of the target compounds were reported to be present in the either the rinsate blank, 9-21-Rinsate, or the method blanks above the reporting limit.

Surrogate Recovery. All surrogate recoveries were within the QC acceptance limits.

Matrix Spike and Duplicate (MS/MSD). Sample NYW-1-Bottom was spiked for the MS/MSD. All percent recoveries and RPDs between the percent recoveries met QC criteria.

Laboratory Control Samples (LCS). All LCS compounds were recovered within their QC acceptance range.

Field Duplicate Sample Review. No discrepancies between reported results for field duplicates were observed.

Reporting Limits and Dilutions. Concentrations between the MDL and the RL were flagged "J," estimated. Due to the high moisture content in sample PBG-3, the required MDLs could not be obtained for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluorene, indeno(1,2,3-cd)pyrene, and pyrene.

B.4 ORGANOCHLORINE PESTICIDES/PCBs

This section summarizes the results of the QA/QC review of the EPA Method 8081B for organochlorine pesticides and 8082A for polychlorinated biphenyls (PCBs).

Holding Time Review. All samples were extracted within the 7-day holding time and analyzed within the 40 day holding time.

Equipment Blanks and Method Blanks. None of the target compounds were reported to be present in the either the rinsate blank, 9-21-Rinsate, or the method blanks above the reporting limit.

Surrogate Recovery. All surrogate recoveries were within the QC acceptance limits.

Matrix Spike and Duplicate (MS/MSD). Sample PGB-3 was spiked for the MS/MSD. All percent recoveries and RPDs between the percent recoveries met QC criteria.

Laboratory Control Samples (LCS). All LCS compounds were recovered within their QC acceptance range.

Field Duplicate Sample Review. Samples PGB-2 and DUP-1; SSN-2 and DUP-2; DUPE 3 (DUP-3) and SFB-2; DUPE 4 (DUP-4) and SFB-1, were sets of field duplicates. No discrepancies between reported results were observed.

Reporting Limits and Dilutions. Due to matrix interference, samples SSN-6, SSN-5, SSS-7, SPL-5, DUPE4 (DUP-4), DUPE3 (DUP-3), SFB-1, SFB-3, SFB-3 and CQS-1 were diluted by factors of ten; samples DUP2, SSN-4, SSN-3, SSN-1, PGB-1, PGB-3, PGB-2, PGB-5, SPL-2, SPL-4, CQS-3, SPL-1, CQS-2, SPL-3, and DUP-1 were diluted by factors of 5. Reporting limits for all analytes were increased by the same factors as the dilutions.

B.5 TOTAL ORGANIC CARBON (TOC)

This section summarizes the results of the QA/QC review of the Standard Methods 5310B for total organic carbon (TOC).

Holding Time Review. All samples were analyzed within the 28 day holding time.

Equipment Blanks and Method Blanks. TOC was not reported to be present in the either the rinsate blank, 9-21-Rinsate, or the method blanks above the reporting limit.

Matrix Spike and Duplicate (MS/MSD). Sample SFB-2 was spiked for the MS/MSD. Percent recoveries of 65.6% and 68.5% for the MS and the MSD, respectively, were below the 70% to 130% QC acceptance range. As a result, the reported concentrations of TOC in the associated samples, SPL-5, DUPE4 (DUP-4), DUPE3 (DUP-3), SFB-1, SFB-3, SFB-2, were flagged “J”, estimated.

Laboratory Control Samples (LCS). All LCS compounds were recovered within their QC acceptance range.

Field Duplicate Sample Review. No discrepancies between reported results for field duplicates were observed.

Reporting Limits and Dilutions. No dilutions were required and reporting limits met project requirements.

B.6 BUTYLTINS

This section summarizes the results of the QA/QC review of the MAI Method for organic tins.

Holding Time Review. There is no stated holding time requirement for organic tin. However, the samples were extracted and analyzed within a few days of sample collection.

Equipment Blanks and Method Blanks. None of the target compounds were reported to be present in the either the rinsate blank, 9-21-Rinsate, or the method blanks above the reporting limit.

Surrogate Recovery. All surrogate recoveries were within the QC acceptance limits.

Matrix Spike and Duplicate (MS/MSD). Sample SSN-6 was spiked for the MS/MSD. All percent recoveries and RPDs between the percent recoveries met QC criteria.

Laboratory Control Samples (LCS). All LCS compounds were recovered within their QC acceptance range.

Field Duplicate Sample Review. No discrepancies between reported results for field duplicates were observed.

Reporting Limits and Dilutions. No dilutions were required and reporting limits met project requirements.

B.7 TOTAL MOISTURE AND TOTAL SOLIDS

Holding Time Review. Samples were tested within the required holding times.

Laboratory Duplicates. No discrepancies were observed with regard to the results reported in the laboratory duplicates.

B.8 SUMMARY

None of the laboratory results were rejected and all results are usable. In certain cases, as described above, some samples had high moisture content, which elevated detection limits above project requirements. In some instances, matrix spike recoveries were outside of their QC limits resulting in reported concentrations that were qualified as estimated. In all cases where concentrations fell between the method detection limit and the reporting limit, the concentrations were flagged “J,” estimated.

APPENDIX F SUPPLEMENTAL BIOLOGICAL INFORMATION

This appendix contains baseline biological information as well as survey guidelines for special-status species as developed by resource agencies including the following:

- Vascular Plants Identified for the Trans Bay Cable Project Area, Contra Costa County, California
- List of Potentially Affected Species
- CNPS Botanical Survey Guidelines (June 2, 2001)
- Plant Communities in the Project Area
- Supplemental Marine Species Information
- Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake (*Thamnophis gigas*) Habitat
- Estimated Sediment Heating Due to Buried Cable Under San Francisco Bay

VASCULAR PLANTS IDENTIFIED FOR THE TRANS BAY CABLE PROJECT AREA, CONTRA COSTA COUNTY, CALIFORNIA

Family	Scientific Name	Common Name
Amaranthaceae		
	Amaranthus albus	Pigweed
Anacardiaceae		
	Schinus molle	Pepper tree*
Apiaceae (Umbelliferae)		
	Eryngium aristulatum	Coyote thistle
	Foeniculum vulgare	Fennel*
Araliaceae		
	Hedera helix	English ivy*
Asclepiadaceae		
	Asclepias fascicularis	Milkweed
Asteraceae (Compositae)		
	Aster lentus	Suisun marsh aster
	Baccharis pilularis	Coyote brush
	Carduus pycnocephalus	Italian thistle*
	Centaurea solstitialis	Yellow star-thistle*
	Cirsium vulgare	Bull thistle*
	Conyza canadensis	Canadian horseweed
	Euthamia occidentalis	Western goldenrod
	Grindelia camporum	Gumplant
	Lactuca serriola	Wild lettuce*
	Picris echioides	Bristly ox-tongue*
	Silybum marianum	Milk thistle*
	Xanthium strumarium	Cocklebur
Boraginaceae		
	Echium candicans	Tower of jewels*
	Heliotropium curassivicum	Wild heliotrope
Brassicaceae		
	Brassica nigra	Black mustard*
	Hirschfeldia incana	Shortpod mustard*
	Lepidium latifolium	Peppergrass*
Chenopodiaceae		
	Atriplex semibaccata	Australian saltbush*
	Chenopodium album	Goosefoot

VASCULAR PLANTS IDENTIFIED FOR THE TRANS BAY CABLE PROJECT AREA, CONTRA COSTA COUNTY, CALIFORNIA

Family	Scientific Name	Common Name
	Chenopodium sp.	Goosefoot
	Bassia hyssopifolia	Bassia*
	Salicornia virginica	Pickleweed
Convolvulaceae		
	vulus arvensis	Bindweed*
Cyperaceae		
	Cyperus eragrostis	Nutsedge
	Scirpus acutus	Hardstem bulrush
	Scirpus californicus	California bulrush
Euphorbiaceae		
	Eremocarpus setigerus	Turkey mullein
Fabaceae (Leguminosae)		
	Melilotus alba	White sweetclover*
	Vicia villosa	Vetch*
Malvaceae		
	Malva nicaeensis	Bull mallow*
	Malvella leprosa	Alkali mallow
Onagraceae		
	Epilobium brachycarpum	Fireweed
	Ludwigia peploides	Water primrose
Poaceae (Gramineae)		
	Avena barbata	Wild oat*
	Bromus diandrus	Ripgut*
	Cortaderia selloana	Pampas grass*
	Cynodon dactylon	Bermuda grass*
	Distichlis spicata	Saltgrass
	Hordeum murinum	Barley*
	Leymus triticoides	Creeping ryegrass
	Lolium multiflorum	Italian ryegrass*
	Panicum capillare	Witchgrass
	Phragmites australis	Common reed
	Polypogon monspeliensis	Rabbitsfoot grass*
	Sorghum halepense	Johnsongrass*

VASCULAR PLANTS IDENTIFIED FOR THE TRANS BAY CABLE PROJECT AREA, CONTRA COSTA COUNTY, CALIFORNIA

Family	Scientific Name	Common Name
Polygonaceae		
	Polygonum arenastrum	Smartweed*
	Rumex crispus	Curly dock*
Pontederiaceae		
	Eichhornia crassipes	Water hyacinth*
Rosaceae		
	Rubus discolor	Himalaya berry*
Salicaceae		
	Populus fremontii	Fremont cottonwood
	Salix laevigata	Red willow
Solonaceae		
	Datura wrightii	Jimson weed
	Nicotiana glauca	Tree tobacco*
	Solanum sp.	Nightshade*
Typhaceae		
	Typha latifolia	Broadleaf cattail

*Denotes non-native species

Source: field reconnaissance performed by URS field Biologists in the spring and fall of 2005.

LIST OF POTENTIALLY AFFECTED SPECIES

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Invertebrates		**LISTED AND PROPOSED SPECIES**		
Lange's metalmark butterfly (*Apodemia mormo langei*)	FE/--/--	Occurs in dry, open area, including dunes, chaparral, sagebrush steppe, grasslands and rocky slopes. Host plants are various buckwheat species including naked –stem buckwheat (*Eriogonum nudum*). The species is known exclusively from the Antioch Dunes National Wildlife Refuge.	Unlikely, no known habitat or host plants occur on the site.	July-September
Vernal pool fairy shrimp *(Branchinecta lynchi)*	**FT/--/--**	**Vernal pools and seasonal wetlands.**	**High, two vernal pools occur along the Pittsburg Converter Station route and a known occurrence of this species in one pool near the project area (CNDDB, 2005).**	**Year round (eggs in dry season, adults in wet season)**
Valley elderberry longhorn beetle *(Desmocerus californicus dimorphus)*	FT/--/--	Occurs in the Central Valley region in association with blue elderberry shrubs. Prefers to lay eggs in elderberry stems greater than 1" in diameter.	Unlikely, elderberry shrubs do not occur in the project vicinity.	Year round (exit holes in shrub stems)
Delta green ground beetle *(Elaphrus viridis)*	FT/--/--	Open habitats in the grassland-playa pool matrix in Solano County, but perhaps wetland and grassland habitat of the Central Valley.	Unlikely, project area has limited native grassland habitat and the range of the species is highly restricted.	Adults active February to May, inactive during summer months.
White abalone *(Haliotes sorenseni)*	FE/--/--	Rocky reefs at depths of 80 to 200 feet in the subtidal zone from Point Conception, California to Punta Abreojos, Baja California.	Low, limited rocky reef habitat in the Bay and is out of the known range for the species.	Year round
Mission blue butterfly *(Icaricia icarioides missionensis)*	E/--/--	Occurs in limited areas including San Bruno Mtn in San Mateo County, Twin Peaks in San Francisco, and Fort Baker in Marin County where it prefers to lay its eggs in lupine plants.	None, no suitable habitat is found in the project area near Potrero Point, San Francisco.	Year round Adult flight season March-July
San Bruno elfin butterfly *(Incisalia mossii bayensis)*	FE/--/--	Occurs in rocky outcrops, woody canyons, and cliffs in limited areas including San Bruno Mountain in San Mateo County. Lays eggs on host stonecrop plant species (*Sedum, Sedella, Dudleya,* and *Parvisedum*).	None, no suitable habitat is found in the project area near Potrero Point, San Francisco.	Year round Adult flight season March-June
Vernal pool tadpole shrimp *(Lepidurus packardi)*	**FE/--/--**	**Vernal pools and swales in the Sacramento Valley.**	**Medium, two vernal pools occur adjacent to the Pittsburg Converter Station route. One known occurrence in the Antioch N Quadrangle**	**Year round**

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Fish				
Tidewater goby *(Eucyclogobius newberryi)*	FE/CSC/--	Endemic to CA, restricted to coastal brackish water habitats in either: upper edge of tidal bays, i.e. San Francisco Bay, near the entrance of freshwater tributaries, or coastal lagoons at mouth of coastal rivers or streams along most of the length of CA.	Low, this species restricted to brackish water habitats near the entrance of freshwater tributaries.	Year round
Delta smelt *(Hypomesus transpacificus)*	FT/CT/--	A euryhaline fish, native to the Sacramento-San Joaquin estuary; spend most of their life in the freshwater portions of the estuary in the Delta, Suisun Bay, Carquinez Straight, and San Pablo Bay.	Low, this species found in the freshwater portions of the estuary.	Year round
Central California coast Coho salmon *(Oncorhynchus kisutch)*	FE/--/--	Anadromous species, spawning in coastal streams and rivers, over gravel beds.	Low, this species uses Bay and Delta as migratory corridor.	Late autumn or winter following heavy rains
Central Valley steelhead *(Onchorhynchus mykiss)*	FT/--/--	Anadromous species, spawning in Sacramento and San Joaquin Rivers and associated tributaries. Spawns in gravel or sand beds.	Low, this species uses Bay and Delta as migratory corridor.	September-February
Central Valley spring-run Chinook salmon *(Oncorhynchus tshawytscha)*	FT/--/--	Anadromous species, spawning in Sacramento and San Joaquin Rivers and associated tributaries. Spawns in gravel or sand beds.	Low, this species uses Bay and Delta as migratory corridor.	November-June
Winter-run chinook salmon *(Onchorhynchus tshawytscha)*	FE/--/--	Anadromous species, spawning in gravel or sand beds. Spawning in Sacramento River below Keswick Dam.	Low, this species uses Bay and Delta as migratory corridor.	September-February
Reptiles				
Alameda whipsnake *(Masticophis lateralis euryxanthus)*	FT/CSC/--	Open, dry habitats with heavy shrub or tree cover. Inhabits chaparral and scrub in the Interior Coast Ranges. Needs mammal burrows for refuge and egg-laying sites.	None, no suitable foraging and egg-laying habitat in project area.	March-October
Giant garter snake *(Thamnophis gigas)*	**FT/CT/--**	**Marshes, streams, and sloughs of the Central Valley.**	**Medium, potential habitat occurs along Middle, New York, and Dowest Slough and Marsh areas along the Pittsburg project area.**	**Winter rains and March-April**
Amphibians				
California tiger salamander (*Ambystoma californiense*)	FT/CSC/--	Estivates in ground squirrel burrows; breeds in stockponds, pools of streams and vernal pools. The species is rarely observed migrating over upland habitats.	Medium, limited habitat within the project area. Numerous known occurrences located in Antioch 3 miles south of project area (CNDDB 2005).	February-April
California red-legged frog *(Rana aurora draytonii)*	FT/CSC/ --	Winters in woodlands and adjacent riparian corridors near water sources; breeds in pools of perennial and intermittent streams and stockponds; prefers banks with dense vegetation.	Low, no habitat is located near the project area. saltmarsh and brackish wetlands are not habitat for this species.	April-October

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Birds				
Western snowy plover *(Charadrius alexandrius nivosus)*	FT/CSC/--	Habitats used by nesting and non-nesting birds include sandy coastal beaches, salt pans, coastal dredged spoils sites, dry salt ponds, salt pond levees and gravel bars. Nests in sandy substrate and forages in sandy marine and estuarine bodies.	Low, no nesting habitat in or adjacent to project area. Potential foraging habitat along the tidal areas of the SF Bay	Year round
Short-tailed albatross *(Diomedea albatrus)*	FE/--/--	Pelagic bird with breeding colonies limited to 2 Japanese islands.	Low, no wintering or nesting habitat, however may forage in the project area	June-October
Bald eagle *(Haliaeetus leucocephalus)*	FT/CE/--	Ocean shorelines, lake margins, and river courses for both nesting and wintering.	Low, no wintering or nesting habitat, however may forage in the project area.	August-January
California black rail *(Laterallus jamaicensis coturniculus)*	**--/CT, CP/--**	**Saline, brackish, and freshwater emergent wetlands of the San Francisco Bay area, Sacramento-San Joaquin Delta, Morro Bay, and few other areas.**	**High, suitable saline and brackish marshland occurs along the Pittsburg Converter Station route and project activities have the potential to impact these wetlands.**	**Year round**
California brown pelican *(Pelecanus occidentalis californicus)* (nesting colony)	FE/CE/--	Nests in islands off the coast of California and forages in open bay and ocean waters.	Low, though the species forages in the open waters of the SF Bay, the project activities are unlikely to adversely affect foraging habitat.	Year round
Bank swallow *(Riparia riparia)* (nesting)	--/CT/--	Restricted to isolated places where fine-textured or sandy, vertical bluffs or riverbanks are available in which to dig burrows in colonies.	Low, no potential habitat in the project area. Nearest know occurrence is along Ocean Beach west of San Francisco.	Year round
California clapper rail *(Rallus longirostris obsoletus)*	**FE/CE/--**	**Salt marshes dominated by pickleweed, bulrush and cord grass**	**High, suitable saline and brackish marshland occurs along the Pittsburg Converter Station route and project activities have the potential to impact these wetlands.**	**April-August**
California least tern *(Sterna antillarum browni)*	FE/CE/--	Nests in flat, open areas along the coast near inshore estuaries, river mouths, or shallows, sandy ground with little or no vegetation, bays, freshwater ponds, channels, lakes. Closest known nesting colony is located at the Pittsburg PG&E plant (Goals Project 2000).	Low, project impacts will occur in roadways and other areas outside of the species potential habitat.	April-August
Mammals				
Guadalupe fur seal *(Arctocephalus townsendi)*	FT/	Coastal waters, islands, isolated, rocky haul-outs.	No potential, not found in the Bay.	Year round
Sei whale *(Balaenoptera borealis)*	FE/	Temperate open seas, nearshore and offshore, from Gulf of Alaska to Baja California.	No potential, not found in the Bay.	Year round
Blue whale *(Balaenoptera musculus)*	FE/	Open waters, occasional inshore waters.	No potential, not found in the Bay.	Year round
Finback whale *(Balaenoptera physalus)*	FE/	Open waters, occasional inshore waters.	No potential, not found in the Bay.	Year round
Right whale *(Eubalaena glacialis)*	FE/	Near shore in shallow waters, large bays.	No potential, not found in the Bay.	Year round
Steller sea-lion *(Eumetopias jubatus)*	FT/	Isolated shoreline and rocky islands from San Mateo County north.	No potential, not found in the Bay.	Year round

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Sperm whale *(Physeter catodon)*	FE/	Deep divers, they inhabit oceanic waters, but come close to shore where submarine canyons bring deep water near the coast.	No potential, not found in the Bay.	Year round
Salt marsh harvest mouse *(Reithrodontomys raviventris)*	**FE/CE, CP/--**	**Coastal salt marsh, often forages in dense stands of pickleweed. May use adjacent upland grasslands for cover and escape from high water.**	**High, project area contains approximately 0.45 miles of mapped habitat along RC Lane near the shoreline and saltmarsh associated with the Pittsburg Converter Station route. A known population of the species is reported in this area (CNDDB 2005)**	**Year round**
San Joaquin kit fox (*Vulpes macrotis mutica)*	FE/CT/--	Native valley and foothill grasslands and chenopod scrub communities of the San Joaquin Valley floor and surrounding foothills from southern Kern County north to Los Baños, Merced County	Low, no grassland foraging or rearing areas with connectivity to SJ kit fox habitat are located in the project area.	Year round
Plants				
Large-flowered fiddleneck (*Amsinckia grandiflora*)	FE/CE/1B	Found rarely in Contra Costa, Alameda and San Joaquin Counties in annual grassland, cismontane woodland, on open grassy slopes below 1200'.	Low, limited marginal potential habitat occurs in the project area in the form of grassland along the Pittsburg Converter Station route.	April-May
Pallid manzanita (*Arctostaphylos pallida*)	FE/CE/1B	Broadleaved upland forest, closed-cone coniferous forest, cismontane woodland and coastal scrub, often on shale or sandy soil.	None, no manzanita species occur in the project area.	December-March
Soft bird's beak (*Cordylanthus mollis* ssp. *mollis*)	FE/CR/1B	Occurs in marshes and swamps (coastal salt) of the San Francisco and East Bay region at elevations below 15 feet. Known from fewer than twenty occurrences.	Low, though suitable habitat occurs adjacent to the project area and the species is known to occur within the region, project impacts will occur in an existing roadway outside of these habitats. The species was not observed during current surveys.	July-November
Palmate bird's-beak (*Cordylanthus palmatus*)	FE/CE/1B	Occurs in alkali meadows and alkali scrub.	Unlikely, no alkaline habitat occurs in the project area, the species was not observed during the current survey and the species is not known from the area.	May-October
Contra Costa wallflower (*Erysimum capitatum* ssp. *angustatum*)	FE/CE/1B	Inland dunes at low elevations. Known from three occurrences in the Antioch Dunes.	Unlikely, the project area lacks suitable habitat for this species.	March-July
Santa Cruz tarplant (*Holocarpha macradenia*)	FT/CE/1B	Coastal prairie, coastal scrub, valley and foothill grasslands, often on clay or sandy soils.	Low, though potential habitat occurs in the project area this species is not known from the area and was not observed during current and surveys.	June-October

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Contra Costa goldfields (*Lasthenia conjugens*)	FE/--/1B	Known from approximately twelve occurrences, occurs in grasslands, playas, cismontane woodland and vernal pools, sometimes on alkaline soils.	Low, though potential habitat occurs in the project area, project impacts will occur in an existing roadway outside these habitats.	March-June
Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*)	--/--/1B	Freshwater and brackish marshes and swamps at elevations below 50'.	Low, though the Pittsburg Converter Station route is adjacent to saltmarsh and brackish marsh and the species is known to occur 0.35 miles east of the route, project impacts will occur in an existing roadway outside of these habitats.	May-September
Mason's lilaeopsis (*Lilaeopsis masonii*)	--/CR/1B	Brackish or freshwater marshes and swamps, typically at elevations below 50'.	Low, the Pittsburg Converter Station route is adjacent to saltmarsh and brackish marsh and the species is known to occur 0.05 miles east of the route, no impacts to these habitats are proposed by the project as trenching will occur in an existing roadway.	April-November
Antioch Dunes evening primrose (*Oenothera deltoides* ssp. *howellii*)	FE/CE/1B	Inland Dunes	Unlikely, the project area lacks suitable habitat for this species. The species occurs 2.3 miles east of the project area in the Antioch Dunes.	March-September
Rock sanicle (*Sanicula saxitilis*)	--/CR/1B	Broadleaved upland forest, chaparral, valley and foothill grassland, often on rocky sites.	Unlikely, no potential habitat occurs in the project area this species is not known from the area and was not observed during current and previous surveys.	April-May
CANDIDATE AND OTHER SPECIAL-STATUS SPECIES				
Invertebrates				
Opler's longhorn moth *(Adela oplerella)*	FSC/--/--	Known from serpentine grasslands of Santa Clara and San Mateo counties	None, no habitat for this species occurs in the project area.	February-August
Ciervo aegialian scarab beetle *(Aegialia concinna)*	FSC/--/--	Occurs in loose interior sand dunes of the Delta and Central Valley	None, no habitat for this species occurs in the project area.	Year round
Antioch Dunes anthicid beetle *(Anthicus antiochensis)*	FSC/--/--	This species is associated with sand dunes and is only known to occur at Antioch Dunes near Antioch, Contra Costa County.	None, no habitat for this species occurs in the project area.	Year round
Sacramento anthicid beetle *(Anthicus sacramento)*	FSC/--/--	Sand dunes and sandbars within riparian areas of the Sacramento-San Joaquin Delta.	None, no habitat for this species occurs in the project area.	Year round
Midvalley fairy shrimp *(Branchinecta mesovallensis)*	FSC/--/--	Vernal pools in grasslands in Sacramento, Solano, Contra Costa, Madera, Merced and Fresno Counties.	Medium, two vernal pools provide potential habitat for this species in the project area.	Year round
Sandy beach tiger beetle *(Cicindela hirticollis gravida)*	FSC/--/--	Typically occurs on sandy beaches, an occurrence is recorded near Potrero Hill within 1 mile of the project area.	None, no habitat for this species occurs in the project area.	Year round

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Globose dune beetle *(Coelus globosus)*	FSC/--/--	Interior sand dunes with open native dune vegetation, known from the Antioch Dunes.	None, no habitat for this species occurs in the project area.	Year round
San Joaquin dune beetle *(Coelus gracilis)*	FSC/--/--	Interior sand dunes, known from the Antioch Dunes.	None, no habitat for this species occurs in the project area.	Year round
Antioch cophuran robberfly *(Cophura hurdi)*	FSC/--/--	Interior sand dunes, known from the Antioch Dunes.	None, no habitat for this species occurs in the project area.	Year round
Antioch efferian robberfly *(Efferia antiochi)*	FSC/--/--	Interior sand dunes, known from the Antioch Dunes.	None, though the species is known to occur in sand dunes 2.3 miles east of project area, no habitat for this species occurs in the project area.	Year round
Black abalone *(Haliotes cracherodii)*	FC/--/--	Rocky substrates in the intertidal zone from the high tide line to a depth of 16 feet. Range includes coastal waters from Baja California to California.	Low, unsuitable substrate found along the shores of the San Francisco Bay.	Year round.
Ricksecker's water scavenger beetle *(Hydrochara rickseckeri)*	**FSC/--/--**	**Freshwater habitats including vernal pools, restricted to the Sacramento, Delta and San Francisco Bay Area**	**Medium, the project area contains potential habitat in the form of seasonal wetlands and vernal pools**	**January-June**
Curve-foot hygrotus diving beetle *(Hygrotus curvipes)*	**FSC/--/--**	**Occurs in vernal pools and wetlands of the Sacramento Delta.**	**Medium, the project area contains potential habitat in the form of seasonal wetlands.**	**January-June**
Middlekauf's shieldback katydid *(Idiostatus middlekaufi)*	FSC/CSC/--	Interior sand dunes, known from the Antioch Dunes.	None, though the species is known to occur in sand dunes 2.3 miles east of project area, no habitat for this species occurs in the project area.	February-July
Bumblebee scarab beetle *(Lichnanthe ursine)*	FSC/--/--	Interior sand dunes, known from the Antioch Dunes and other Bay Area dunes.	None, though the species is known to occur in sand dunes 2.3 miles east of project area, no habitat for this species occurs in the project area.	February-July
California linderiella fairy shrimp *(Linderiella occidentalis)*	**FSC/CSC/--**	**Occurs in vernal pools and seasonal wetlands of the Central Valley, Central Coast and Delta.**	**High, the species is known to occur within seasonal wetlands near the Pittsburg Converter Station route.**	**Year round**
Hurd's metapogon robberfly *(Metapogon hurdi)*	FSC/--/--	Interior sand dunes, known from the Antioch Dunes.	None, though the species is known to occur in sand dunes 2.3 miles east of project area, no habitat for this species occurs in the project area.	February-July
Antioch multilid wasp (*Myrmosula pacifica*)	--/CSC/--	Occurs in interior dunes (Antioch Dunes)	None, no habitat for this species occurs in the project area.	February-July
Yellow-banded andrenid bee *(Perdita hirticeps luteocincta)*	FSC/--/--	Occurs in interior dunes (Antioch Dunes)	No potential, no habitat for this species occurs in the project area.	February-July
Antioch andrenid bee (*Perdita scituta antiochensis*)	--/CSC/--	Occurs in interior dunes (Antioch Dunes)	No potential, no habitat for this species occurs in the project area.	February-July
Antioch sphecid wasp *(Philanthus nasilis)*	FSC/--/--	Occurs in interior dunes (Antioch Dunes)	No potential, no habitat for this species occurs in the project area.	February-July

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Fish				
Fall/late fall-run chinook salmon *(Onchorhynchus tshawytscha)*	FC/--/--	Anadromous species, spawning in Sacramento and San Joaquin Rivers and associated tributaries. Spawns in gravel or sand beds.	Low, project impacts only a very small area of Bay and Delta benthic habitat.	September-May
Green sturgeon *(Acipenser medirostris)*	FSC/--/--	Feeds in estuaries and bays from San Francisco Bay to British Columbia and spawns in fresh water in the mainstem of only a handful of large rivers. Occurs in Sacramento-San Joaquin Rivers and Delta; prefer to spawn in large cobble.	Low, project impacts only a very small area of Bay and Delta benthic habitat.	Year round
River lamprey *(Lampetra ayresi)*	FSC/--/--	Anadromous species lives in salt water and spawns in fresh water; spawning requires clean, gravelly riffles in permanent streams.	Low, project impacts only a very small area of Bay and Delta benthic habitat.	Year round
Pacific lamprey *(Lampetra tridentata)*	FSC/--/--	Anadromous species lives in salt water and spawns in fresh water; adults favor coarser gravel-rubble substrate for spawning.	Low, project impacts only a very small area of Bay and Delta benthic habitat.	Year round
Sacramento splittail *(Pogonichthys macrolepidotus)*	FSC/CSC/--	Primarily freshwater fish, but are tolerant of moderate salinities of 10-18 ppt. In the 1950s, they were commonly caught in Suisun Bay. During the past 20 years they have been found mostly in slow-moving sections of rivers and in sloughs and have been most abundant in the Suisun Bay and Marsh region.	Low, project impacts only a very small area of Bay and Delta benthic habitat.	Year round
Longfin smelt *(Spirinchus thaleichthys)*	FSC/--/--	Occupy middle/bottom of the water column in salt or brackish water; spawn in fresh water rivers and dead-end sloughs, over sandy-gravel substrates, rocks, and aquatic plants.	Low, project impacts only a very small area of Bay and Delta benthic habitat.	Year round
Reptiles				
Silvery legless lizard *(Anniella pulchra pulchra)*	FSC/--/--	Forages at the base of vegetation either on the surface, or in burrows near the surface through loose soil. Prefers loose soils associated with drainages and valley bottoms.	Low, limited habitat within project area. Species is known to occur in Black Diamond Mines Preserve to the southwest of the project area and the Antioch Dunes Wildlife Refuge 2.3 miles from the project area.	Year round, excluding winter
Northwestern pond turtle *(Clemmys marmorata marmorata)*	FSC/CSC/--	Rivers and streams with some canopy cover. Inhabits ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Need basking sites and sandy banks or open grassy fields for egg-laying.	Low, though brackish and saltwater marsh, areas occur adjacent to the project area along the Pittsburg Converter Station Alternative route no impacts to these wetlands are proposed from the project. The species is documented as occurring within 0.5 miles of the project area (CNDDB 2005).	Year round, excluding winter
Southwestern pond turtle *(Clemmys marmorata pallida)*	FSC/CSC/--	Rivers and streams with some canopy cover. Inhabits ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Need basking sites and sandy banks or open grassy fields for egg-laying.	Unlikely, project area is outside the known range of the species.	Year round, excluding winter
San Joaquin coachwhip *(Masticophis flagellum ruddocki)*	FSC/CSC/--	Occurs in grasslands, coastal scrub and chaparral communities in San Joaquin and Contra Costa Counties.	Unlikely, no suitable habitat is found in the project area.	March-October

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California horned lizard *(Phrynosoma coronatum frontale)*	FSC/CSC/--	Inhabits variety of habitats, usually lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial. Must have abundant ants and other insects.	Unlikely, no suitable habitat is found in the project area.	March-October
Amphibians				
Foothill yellow-legged frog *(Rana boylii)*	FSC/--/--	Fast-moving rivers and streams in chaparral, forests, and woodlands.	Unlikely, no suitable habitat in project area. Most likely outside of species range.	February-September
Western spadefoot *(Scaphiopus hammondii)*	FSC/CSC/--	Primarily found in grasslands; also found in hardwood woodlands; vernal pools are essential for breeding and egg-laying.	Low, though limited suitable breeding habitat occurs adjacent to Pittsburg Converter Station route (vernal pool) within grassland, project impacts will occur outside of this habitat in an existing roadway.	October-April
Birds				
Tricolored blackbird *(Agelaius tricolor)* (nesting colony)	FSC/CSC/--	Nomadic resident of Sacramento-San Joaquin Valley and low foothills; nests colonially in vicinity of fresh water, marshy areas. Colonies prefer heavy growths of cattails and tules.	Low, no freshwater marshland occurs in the project area.	Year round
Bell's sage sparrow *(Amphispiza belli belli)*	FSC/CSC/--	Found in low, dense stands of shrubs; forages on insects, spiders, and seeds; nests located on ground beneath shrub; seed diet must be supplemented with succulent foods.	Low, project area lacks suitable habitat.	Year round
Black turnstone *(Arenaria melanocephala)*	**FSC/--/--**	**Rocky shores and intertidal marine habitats of California. Also may occur on sand breaches and mudflats. Requires undisturbed areas above tide for roosting.**	**Medium, project area may provide some foraging or roosting habitat.**	**July-May**
Western burrowing owl *(Athene cunicularia)*	FSC/CSC/--	Inhabits open, grasslands and scrublands characterized by low-growing vegetation. Subterranean nester dependent upon burrowing mammals, specifically California ground squirrel.	Low, limited open grassland habitat in project area and absence of small mammal burrows or colonies.	Spring and Winter
Oak titmouse *(Baeolophus inornatus)*	FSLC/	Year round resident of oak and oak-pine woodlands, sometimes juniper woodlands, cavity nester.	Unlikely, project site has no suitable nesting or foraging habitat.	
Aleutian Canada goose *(Branta canadensis leucopareia)*	FD/	Inhabits lakes, rivers and marshes during migration and often feeds on marsh vegetation or in open grasslands or fields.	Low, project vicinity offers potential foraging and resting areas but project impacts will occur outside these habitats.	Fall and Winter
Ferruginous hawk *(Buteo regalis)*	FSC/CSC/--	Inhabits open grasslands, low foothills and desert scrub; nests in trees, low cliffs, and other elevated structures. Eats mainly lagomorphs, and other small mammals; also birds, amphibians, and reptiles. No nesting records in California.	Unlikely, project site has no suitable nesting and limited foraging habitat.	Winter
Red knot *(Calidris canutus)*	FSC/--/--	Migrant of coastal estuarine sand or mudflats, less often on sandy beaches of the outer coast.	Low, project offers limited foraging areas.	August-October & April-May
Vaux's swift *(Chaetura vauxi)*	FSC/CSC/--	Summer resident of redwood and Douglas fir forests with hollow trees and snags.	Unlikely, no suitable habitat present	April-May & August-September

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Northern harrier (*Circus cyaneus*)	**--/CSC/--**	**The "marsh hawk" forages over grasslands, marshes and wetlands; nests on ground in grasslands or mound of marsh vegetation within wetlands.**	**Medium, portions of the Pittsburg Converter Station route represent optimal foraging and nesting habitat for the species.**	**Year round**
Black swift *(Cypseloides niger)*	FSC/CSC/--	Mountains and coastal cliffs. Nests in a moist crevice or cave on coastal cliffs or behind or adjacent to waterfalls in deep canyons.	Unlikely, no suitable habitat is in the project area.	September-May (absent October-April)
White-tailed kite (*Elanus leucurus)*	**FSC/CP/--**	**Nests in dense oak, willow, or other tree stands near open grassland meadows, farmlands, and emergent wetlands.**	**Medium, suitable foraging habitat in project area. Species is known to nest within 0.5 miles of Pittsburg Converter Station route and was observed during current surveys**	**Year round**
Little willow flycatcher *(Empidonax trailii brewsteri)*	FSC/--/--	Summer resident of montane wet meadow or riparian habitats 2,000-8,000 feet elevation. Fall and spring migrant to North Coast areas. Nests in dense riparian cover, typically willows. Summer migrant in the project area.	Unlikely, no suitable habitat in the project area.	Summer
American peregrine falcon *(Falco peregrinus anatum)*	FSC/CSC/--	Cliff ledges, particularly near shores and marshes	Unlikely, unsuitable habitat in the project vicinity.	Year round
Saltmarsh common yellowthroat *(Geothylpis trichas sinuosa)*	**--/CSC/--**	**San Francisco Bay region in fresh and saltwater marshes with thick continuous cover to water surface, tall grasses, tule patches and willows for nesting.**	**High, suitable habitat is found within the project area along the Pittsburg Converter Station route, project activities have the potential to impact these wetland habitats. Nearest occurrence is on the NE side of Browns Island in Pittsburg.**	**Spring-Fall, Breeds: April-July**
Black oystercatcher *(Haematopus bachmani)*	FSC/--/--	Permanent resident along rocky marine shores of the entire California coast.	Low, limited foraging habitat	Year round
Harlequin duck *(Histrionicus histrionicus)*	FSC/CSC/--	October to early April in marine waters along rocky coast from San Luis Obispo Co. north, with stragglers remaining through the summer. Nests May to August on large, turbulent sierran rivers from Madera to Tuolomne counties.	Low, unsuitable habitat in the project area.	October-April & May-August
Loggerhead shrike *(Lanius ludovicianus)*	FSC/CSC/--	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. Highest densities known from open-canopied hardwoods and riparian habitats, but also occurs in open croplands. Nests in dense shrubs and brush near open foraging areas such as grasslands. Forages on large insects, small birds, mammals, amphibians, reptiles, fish, carrion, and invertebrates.	Unlikely, marginal habitat in the project area, limited grassland or shrubland in the project vicinity.	Year round
Marbled godwit *(Limosa fedoa)*	FSC/--/--	Winter visitant of estuarine habitats throughout the state. Forages in mudflats and sandy areas with shallow water. Requires undisturbed emergent wetland, fields, or salt ponds for roosting during high tide.	Low, though suitable marshland occurs near the project site, project impacts will occur in an existing roadway outside of these habitats.	August-May

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Lewis' woodpecker *(Melanerpes lewis)*	FSC/--/--	Suitable habitat includes open deciduous and conifer habitats with brushy understory, with scattered snags and live trees for nesting and perching. Forages primarily on insects in spring and summer, fruits, acorns, nuts, and seeds other times of year.	Unlikely, Appropriate habitat characteristics are not present in the project area.	Year round
Long-billed curlew *(Numenius americanus)*	--/CSC/--	Nests near water in prairies and grassy meadows in northeastern California. Wintering habitat includes coastal estuaries, tidal mudflats, upland herbaceous areas, and croplands.	Low, though suitable marshland and mudflats occur near the project site, project impacts will occur in an existing roadway outside of these habitats.	June-April
Whimbrel *(Numenius phaeopus)*	FSC/--/--	Rocky intertidal, mudflats, sandy breaches, estuarine habitats, wet meadows, and pastures along the central California coast	Low, though suitable marshland and mudflats occur near the project site, project impacts will occur in an existing roadway outside of these habitats.	March-May
Ashy storm-petrel *(Oceanodroma homochroa)*	FSC/CSC/--	Spends most time out at sea. Only comes ashore to breed. Most Breeding habitat is offshore islands and rocks.	Unlikely, no suitable habitat in the project area.	Year round
Black skimmer *(Rynchops niger)*	FSC/CSC/--	May visit coastal estuaries and river mouths and the San Francisco Bay. Nests in coastal beaches or sandbars-mostly at the Salton Sea and San Diego Bay. Forages in calm shallow water.	Low, marginal habitat for foraging or nesting	Spring-Summer in the Central Coast areas
Rufous hummingbird *(Selasphorus rufus)*	FSC/--/--	Breeds north of California in coniferous forests. Winters in south to south central Mexico. Uses valley foothill hardwood, valley foothill hardwood conifer, riparian, and various chaparral habitats with nectar-producing flowers during migration. Besides nectar, also feeds on insects, spiders, and tree sap.	Unlikely, no suitable habitat is in the project area.	February-May, July-September, Some may stay year round
Allen's hummingbird *(Selasphorus sasin)*	FSC/--/--	Coastal scrub, valley foothill hardwood, valley foothill riparian, closed-cone pine-cypress, redwood, and urban habitats. Builds nests in trees, shrubs, vines, and ferns.	Unlikely, no suitable habitat is in the project area.	January-July
Elegant tern *(Sterna elegans)*	FSC/CSC/--	Summer visitor from breeding grounds in Mexico. Only known breeding in the US is in San Diego Bay. Forages in inshore coastal waters, bays, estuaries, and harbors; rarely occurs far offshore, and never inland. Roosts in together on tideflats and beaches.	Low, though suitable marshland and mudflats occur near the project site, project impacts will occur in an existing roadway outside of these habitats.	June-October
Mammals				
Pacific western big-eared bat (Corynorhinus (=Plecotus) townsendii townsendii)	FSC/--/--	Roosting sites include caves and cave-type dwellings such as tunnels, mines, and bridges. Feeds primarily on moth species in a variety of habitats except subalpine and alpine communities. Tend to forage within 2.4 km (1.5 mi) of roosting areas.	No potential, no foraging or roosting habitat in the project area.	Year round
Gray whale *(Eschrichtius robustus)*	FD/--/--	Present range is limited to the eastern North Pacific; generally stays within coastal waters.	Low potential, rarely seen in the Bay.	Spring and fall migration along CA coast.
Greater western mastiff-bat *(Eumops perotis californicus)*	FSC/CSC/--	Forages over grasslands and roosts in caves and rock crevices.	No potential, no foraging or roosting habitat in the project area.	Year round

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Small-footed myotis bat *(Myotis ciliolabrum)*	FSC/--/--	Forages over grasslands and roosts in buildings, caves, and rock crevices in relatively arid woody and brushy uplands near water	No potential, no foraging or roosting habitat in the project area.	Year round
Long-eared myotis bat *(Myotis evotis)*	FSC/--/--	Forages over grasslands and roosts in trees, buildings, caves, and rock crevices.	No potential, no foraging or roosting habitat in the project area.	April-October
Fringed myotis bat *(Myotis thysanodes)*	FSC/--/--	Forages over grasslands and roosts in trees, buildings, caves, and rock crevices.	No potential, no foraging or roosting habitat in the project area.	March-October
Long-legged myotis bat *(Myotis volans)*	FSC/--/--	Forages over grasslands and chaparral and roosts in trees, caves, buildings and rock crevices.	No potential, no foraging or roosting habitat in the project area.	March-November
Yuma myotis bat *(Myotis yumanensis)*	FSC/--/--	Forages over open water and streams and roosts in trees, buildings, caves and rock crevices.	No potential, no foraging or roosting habitat in the project area.	April-October
San Francisco dusky-footed woodrat *(Neotoma fuscipes annectens)*	FSC/CSC/--	Forest riparian communities of moderate canopy and moderate to dense understory of favorable stick nest building materials.	No potential, no foraging or breeding habitat in the project area.	Year round
San Joaquin pocket mouse *(Perognathus inornatus inornatus)*	FSC/CSC/--	Typically found in grasslands and blue oak savannas between 110 to 2000 feet; need friable soils.	Unlikely, no foraging or breeding habitat in the project area.	Year round
Suisun ornate shrew *(Sorex vagrans halicoetes)*	FSC/CSC/--	Tidal marshes of the northern shores of San Pablo and Suisun Bays.	Medium, though suitable marsh habitat occurs adjacent to and the Pittsburg Converter route, project impacts will occur outside of these habitats in an existing roadway.	Year round
Point Reyes jumping mouse *(Zapus trinotatus orarius)*	FSC/CSC/--	Bunch grass marshes on the uplands that are safe from continuous inundation. Know range is in the Point Reyes area.	Unlikely, limited poor habitat present; outside know range.	Year round
Plants				
Bent-flowered fiddleneck (*Amsinckia lunaris*)	**--/--/1B**	**Coastal bluff scrub, cismontane woodland, valley and foothill grassland, typically below 2000'**	**Medium, potential habitat occurs in the project area, though this species is not known from the area, current surveys were conducted outside of the bloom period.**	**March-June**
Mt. Diablo manzanita (*Arctostaphylos auriculata*)	--/--/1B	Chaparral and cismontane woodlands, often on sandstone.	None, no potential habitat occurs in the project area and no manzanita shrubs were observed during current surveys.	February-March
Contra Costa manzanita (*Arctostaphylos manzanita* ssp. *laevigata*)	--/--/1B	Chaparral and cismontane woodlands, often on sandstone.	None, no potential habitat occurs in the project area and no manzanita shrubs were observed during current surveys.	February-March

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Suisun marsh aster (*Aster lentus*)	**FSC/--/1B**	**Saltmarshes and brackish wetlands of the San Francisco and Suisun Bay region.**	**High, the species occurs within the project area on the edge of New York Slough, directional drilling is proposed to avoid impacts along the shoreline of the Pittsburg Converter Station route.**	**May-November**
Coastal marsh milk-vetch *Astragalus pycnostachyus* var. *pycnostachyus*	--/--/1B	Wet coastal dunes, coastal saltmarshes and swamps, known from fewer than ten occurrences in Marin, San Mateo and Humboldt Counties.	Unlikely, no marsh or swamp wetlands occur on or near Potrero Point at the San Francisco Converter Station route.	April-October
Alkali milk-vetch (*Astragalus tener* var. *tener*)	**--/--/1B**	**Playas, valley and foothill grassland and vernal pools; often on alkaline soils.**	**Medium, limited potential habitat occurs in the project area along the Pittsburg Converter Station route and a known occurrence is documented near the San Francisco Converter Station route (CNDDB 2005). Surveys were conducted outside the bloom period.**	**March-June**
Heartscale *(Atriplex cordulata)*	--/CSC/List 1B	Valley foothill grasslands on alkaline sandy soils.	Unlikely, no alkaline or sandy soils occur in the project area. Limited grassland habitat along Pittsburg Converter Station route. Species was not located during current surveys.	May-October
Crownscale (*Atriplex coronata* ssp. *coronata*)	--/--/4	Grasslands, seasonal wetlands, vernal pools and chenopod scrub, typically with alkaline soils.	Unlikely, no alkaline or sandy soils occur in the project area. Limited grassland habitat along Pittsburg Converter Station route. Species was not located during current surveys.	April-October
Brittlescale *(Atriplex depressa)*	--/CSC/List 1B	Alkaline or clay grasslands, chenopod scrub, and playas.	Low, no alkaline and limited clay grasslands occur in the project area along the Pittsburg Converter Station route. Species was not located during current surveys.	May-October
San Joaquin spearscale (*Atriplex joaquiniana*)	--/CSC/List 1B	Chenopod scrub, meadows and seeps, playas and valley and foothill grassland; typically with alkaline soils.	Unlikely, no alkaline or sandy soils occur in the project area. Limited grassland habitat along Pittsburg Converter Station route. Species was not located during current surveys.	April-October

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Big tarplant *(Blepharizonia plumosa* ssp *plumosa)*	--/CSC/List 1B	Valley and foothill grasslands, plains.	Low, though the species is recorded in the Pittsburg area from a 1916 occurrence within the area of the proposed access road for the Pittsburg Converter Station, limited potential habitat currently occurs along this entire route and the species was not observed during current surveys.	July-October
Brewer's calandrinia (*Calandrinia breweri*)	--/--/4	Annual grasslands, chaparral and scrub, often in burns or disturbed areas. Distributed uncommonly through foothills of the Coast Range and Sierra Nevada Foothills.	Low, limited potential habitat occurs in the project area.	March-June
Mt. Diablo fairy lantern (*Calochortus pulchellus*)	--/--/1B	Chaparral, oak woodland and grasslands	Low, limited potential habitat occurs in the project area.	April-June
Congdon's tarplant (*Centromadia parryi* ssp. *parryi*)	--/--/1B	Coastal prairie, meadows and seeps, marshes and swamps (coastal salt), and valley and foothill grasslands.	Low, though limited potential habitat occurs in the project area, this species was not observed during current surveys.	May-November
San Francisco Bay sunflower (*Chorizanthe cuspidata* ssp. *cuspidata)*	--/--/1B	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub	Low, the species is restricted in range and is not known from Contra Costa County. No potential habitat for this species occurs within the proposed San Francisco Converter Station site or adjacent developed/ industrial areas.	April-August
Pt. Reyes bird's beak (*Cordylanthus maritimus* ssp. *palustris*)	--/--/1B	Marshes and swamps (coastal salt)	Low, though potential habitat occurs within the Pittsburg Converter Station route the species was not observed during current surveys.	June-October
Hispid bird's beak (*Cordylanthus mollis* ssp. *hispidus*)	--/--/1B	Meadows and seeps, playas, valley and foothill grasslands, often on alkaline soils, typically below 600'.	Low, potential habitat occurs in the project area though the species is not known from the area and was not observed during current surveys.	June-September
Hoover's cryptantha (*Cryptantha hooveri*)	**--/--/1B**	**Valley and foothill grasslands often on sandy soils.**	**Medium, limited potential habitat occurs in the Pittsburg Converter Station route and the species is known to occur 2.3 miles east of the project area in the Antioch Dunes. Current surveys occurred outside the species bloom period.**	**April-May**

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Hospital Canyon larkspur (*Delphinium californicum* ssp. *interius)*		Moist slopes and ravines in cismontane woodlands and grasslands.	Low, though potential habitat occurs in the project area this species is not known from the area. The current survey effort occurred outside the species bloom period.	April-June
Recurved larkspur *(Delphinium recurvatum)*	--/--/1B	Valley foothill grasslands on alkaline soils, cismontane woodlands.	Low, though marginal potential habitat occurs in the project area this species is not known from the area. The current survey effort occurred outside the species bloom period.	March-May
Western leatherwood (*Dirca occidentalis*)	--/--/1B	Coniferous forests, cismontane woodlands, riparian scrub, riparian woodland.	None, though potential habitat occurs in the project area this species is not known from the area and was not observed during current and previous surveys.	January-April
Dwarf downingia (*Downingia pusilla*)	**--/--/1B**	**Vernal pools.**	**Medium, vernal pool habitat occurs in the project area within the Pittsburg Converter Station route, and the current survey occurred outside the bloom period.**	**March-May**
Mt. Diablo buckwheat (*Eriogonum truncatum*)	--/--/1A	Chaparral, coastal scrub, valley and foothill grasslands, often on sandy soils. Presumed extinct until recently, last seen in 1940. Rediscovered in spring 2005 on Mt. Diablo.	Unlikely, abundant potential habitat occurs in the project area, but the species is unlikely to be found in these grazed grasslands. Historically occurred within the Antioch South Quad., has since been extirpated.	April-November
Round-leaved filaree (*Erodium macrophyllum*)	**--/--/2**	**Cismontane woodland, valley and foothill grassland, often on clay.**	**Medium, this species is known to occur within 2.3 miles and potential habitat occurs in the project area, the current survey was outside of the bloom period.**	**March-May**
Diamond-petaled California poppy (*Eschscholzia rhombipetala*)	--/--/1B	Typically on alkaline clay soils in valley and foothill grasslands below 3100'	Low, this species was previously known to occur 2.3 miles east of the project area in the Antioch Dunes and limited potential habitat occurs in the project area, current surveys occurred outside the species bloom period. The closest historical occurrence is considered extirpated.	March-April
Fragrant fritillary (*Fritillaria liliacea*)	--/--/1B	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland, often on serpentine.	Low, though potential habitat occurs in the project area this species is not known from the area and was not observed during current and previous surveys.	February-April

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Delta mudwort (*Limosella subulata*)	**--/--/2**	**Brackish or freshwater marshes and swamps, typically at elevations below 20'.**	**High, this species is known to occur 0.03 miles east of the project area and limited potential habitat occurs in the project area, current surveys occurred outside the species bloom period.**	**May-August**
Showy madia (*Madia radiata*)	**--/--/1B**	**Cismontane woodland and valley and foothill grassland.**	**Medium, the project vicinity provides limited suitable habitat for this species and current surveys occurred outside of the bloom period.**	**March-May**
Hall's bush mallow (*Malacothamnus hallii*)	--/--/1B	Chaparral, coastal scrub.	None, the project area provides no suitable habitat for this species the species was not observed in current surveys.	May-September
Bearded popcorn flower (*Plagiobothrys hystriculus*)	--/--/1A	Presumed extinct, last collected in 1892. Known from one collection in the Montezuma Hills. Wet sites in grasslands.	Unlikely, the project area contains limited habitat for this species, the species was not observed and is not expected to occur.	April-May
Eel-grass pondweed (*Potamogeton zosteriformis*)	--/--/2	Freshwater marshes and swamps.	Unlikely, potential habitat occurs in the project area, species is not known from the area and not observed during current surveys.	June-July
Caper-fruited tropidocarpum *(Tropidocarpum capparideum)*	FSC/CSC/List 1A	Alkaline soils in valley and foothill grasslands. Last seen in 1957, this species is presumed extinct.	Unlikely, though marginal potential habitat is available in the project area, project impacts will occur in existing roadways and railroad right of ways.	March-April
Sensitive Natural Communities				
Bulrush marsh	**--/--/--**	**These freshwater and brackish marsh habitats dominated by bulrush occur in coastal and Delta locations. These areas have become increasingly rare and fragmented in the current California landscape due to urbanization and conversion of open lands.**	**High, this community occurs adjacent to and within portions of the Pittsburg Converter Station route. Project impacts have the potential to impact this wetland community.**	**Year-round**
Northern claypan vernal pool	**--/--/--**	**These seasonal pools are subtended by claypan soils. They can support vernal pool crustaceans such as fairy shrimp and are sometimes surrounded by unique plant assemblages. These habitats have become increasingly rare in the modern California landscape.**	**High, one vernal pool occurs adjacent to the Pittsburg Converter Station route, and one seasonal wetland that may be classified within this community occurs within the BNSF ROW. Project activities have the potential to impact both pools.**	**Late Winter to Early Summer**
Pickleweed saltmarsh	**--/--/--**	**These saltwater marsh habitats occur in coastal and Delta locations, and are dominated by pickleweed and often bordered by saltgrass. These areas have become increasingly rare and fragmented in the current California landscape due to urbanization and conversion of open lands.**	**High, this community occurs adjacent to and within portions of the Pittsburg Converter Station route. Project activities have the potential to impact this wetland community.**	**Year-round**

Species	Listing Status Federal/ State/ CNPS Listing	General Habitat	Potential for Impact	Period of Identification/ Blooming Period
Red willow forest	**--/--/--**	**Red willow riparian forests are important wetland and wildlife communities in California. These areas have become increasingly rare and fragmented in the current California landscape due to urbanization and conversion of open lands.**	**High, this community occurs adjacent to and within portions of the Pittsburg Converter Station route along the BNSF ROW. Project activities have the potential to impact this wetland community.**	**Year-round**
Serpentine bunchgrass	--/--/--	Grasslands underlain by serpentine soils often have a strong component of native, endemic or rare species, these communities have become increasingly uncommon in California.	None. No serpentine grasslands occur in the project area.	Year-round
Stabilized interior dunes	--/--/--	These interior dunes occur at the Antioch dunes and other remnant dune habitats in the Eastern Bay Area.	None. No dune habitat occurs in the project area.	Year-round
Valley needlegrass grassland	--/--/--	Once widespread in the California landscape perennial native grasslands dominated by needlgrass species such as purple needlegrass, nodding needlegrass or western needlegrass have become restricted and uncommon due to pressures from development and invasion and planting of non-native species introduced for livestock forage or cultivation.	None, no stands of needlegrass grassland were located in the project area.	Year-round

United States Fish and Wildlife Service classifications:
FE = Species in danger of extinction throughout all or significant portion of it's range.
FT = Species likely to become endangered within foreseeable future throughout all or significant portion of its range.
PE = Species proposed endangered.
PT = Species proposed threatened.
FC = Candidate information now available indicates that listing may be appropriate with supporting data currently on file.
FSC = Species of special concern.

California Department of Fish and Game classifications:
CE = State listed as endangered. Species who's continued existence in California is jeopardized.
CT = State listed as threatened. Species, although not presently threatened with extinction, may become endangered in the foreseeable future.
CR = State listed as rare. Plant species, although not presently threatened with extinction, may become endangered in the foreseeable future.
CSC = California species of special concern. Animal species with California breeding populations that may face extinction in the near future.
CP = Fully protected by the State of California under Section 3511 and 4700 of the CDFG Code.

California Native Plant Society classifications:
List 1A = Plants that are presumed extinct in California.
List 1B = Plants that are Rare, Threatened, or Endangered in California and elsewhere.
List 2 = Plants that are Rare, Threatened or Endangered in California but more common elswhere.
List 3 = Plants for which more information is needed.
List 4 = Plants of limited distribution.

SOURCE: CDFG, 2005; CNPS, 2005; USFWS, 2005

CNPS Botanical Survey Guidelines

CALIFORNIA NATIVE PLANT SOCIETY
December 9, 1983
Revised June 2, 2001

The following recommendations are intended to help those who prepare and review environmental documents determine when a botanical survey is needed, who should be considered qualified to conduct such surveys, how surveys should be conducted, and what information should be contained in the survey report. The California Native Plant Society recommends that lead agencies not accept the results of surveys unless they are conducted and reported according to these guidelines.

1. Botanical surveys are conducted in order to determine the environmental effects of proposed projects on all botanical resources, including special status plants (rare, threatened, and endangered plants) and plant (vegetation) communities. Special status plants are not limited to those that have been listed by state and federal agencies but include any plants that, based on all available data, can be shown to be rare, threatened, or endangered under the following definitions:

   > A species, subspecies, or variety of plant is “endangered” when the prospects of its survival and reproduction are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, over-exploitation, predation, competition, or disease. A plant is "threatened" when it is likely to become endangered in the foreseeable future in the absence of protection measures. A plant is "rare" when, although not presently threatened with extinction, the species, subspecies, or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens.[1]

   Rare plant (vegetation) communities are those communities that are of highly limited distribution. These communities may or may not contain special status plants. The most current version of the California Natural Diversity Database's *List of California Terrestrial Natural Communities*[2] should be used as a guide to the names and status of communities.

   Consistent with the California Native Plant Society’s goal of preserving plant biodiversity on a regional and local scale, and with California Environmental Quality Act environmental impact assessment criteria[3], surveys should also assess impacts to locally significant plants. Both plants and plant communities can be considered significant if their local occurrence is on the outer limits of known distribution, a range extension, a rediscovery, or rare or uncommon in a local context (such as within a county or region). Lead agencies should address impacts to these locally unique botanical resources regardless of their status elsewhere in the state.

2. Botanical surveys must be conducted to determine if, or to the extent that, special status or locally significant plants and plant communities will be affected by a proposed project when any natural vegetation occurs on the site and the project has the potential for direct or indirect effects on vegetation.

3. Those conducting botanical surveys must possess the following qualifications:
   a. Experience conducting floristic field surveys;
   b. Knowledge of plant taxonomy and plant community ecology and classification;
   c. Familiarity with the plants of the area, including special status and locally significant plants;

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[1] California Environmental Quality Act Guidelines, §15065 and §15380.
[2] List of California Terrestrial Natural Communities. California Department of Fish and Game Natural Diversity Database. Sacramento, CA.
[3] California Environmental Quality Act Guidelines, Appendix G (Initial Study Environmental Checklist).

d. Familiarity with the appropriate state and federal statutes related to plants and plant collecting; and,
e. Experience with analyzing impacts of a project on native plants and communities.

4. Botanical surveys should be conducted in a manner that will locate any special status or locally significant plants or plant communities that may be present. Specifically, botanical surveys should be:

    a. Conducted in the field at the proper times of year when special status and locally significant plants are both evident and identifiable. When special status plants are known to occur in the type(s) of habitat present in the project area, nearby accessible occurrences of the plants (reference sites) should be observed to determine that the plants are identifiable at the time of survey.

    b. Floristic in nature. A floristic survey requires that every plant observed be identified to species, subspecies, or variety as applicable. In order to properly characterize the site, a complete list of plants observed on the site shall be included in every botanical survey report. In addition, a sufficient number of visits spaced throughout the growing season is necessary to prepare an accurate inventory of all plants that exist on the site. The number of visits and the timing between visits must be determined by geographic location, the plant communities present, and the weather patterns of the year(s) in which the surveys are conducted.

    c. Conducted in a manner that is consistent with conservation ethics and accepted plant collection and documentation techniques[4,5]. Collections (voucher specimens) of special status and locally significant plants should be made, unless such actions would jeopardize the continued existence of the population. A single sheet should be collected and deposited at a recognized public herbarium for future reference. All collections shall be made in accordance with applicable state and federal permit requirements. Photography may be used to document plant identification only when the population cannot withstand collection of voucher specimens.

    d. Conducted using systematic field techniques in all habitats of the site to ensure a thorough coverage of potential impact areas. All habitats within the project site must be surveyed thoroughly in order to properly inventory and document the plants present. The level of effort required per given area and habitat is dependent upon the vegetation and its overall diversity and structural complexity.

    e. Well documented. When a special status plant (or rare plant community) is located, a California Native Species (or Community) Field Survey Form or equivalent written form, accompanied by a copy of the appropriate portion of a 7.5-minute topographic map with the occurrence mapped, shall be completed, included within the survey report, and separately submitted to the California Natural Diversity Database. Population boundaries should be mapped as accurately as possible. The number of individuals in each population should be counted or estimated, as appropriate.

5. Complete reports of botanical surveys shall be included with all environmental assessment documents, including Negative Declarations and Mitigated Negative Declarations, Timber Harvesting Plans, Environmental Impact Reports, and Environmental Impact Statements. Survey reports shall contain the following information:

    a. Project location and description, including:

[4] Collecting Guidelines and Documentation Techniques. California Native Plant Society Policy (adopted March 4, 1995).
[5] Ferren, W.R., Jr., D.L. Magney, and T.A. Sholars. 1995. The Future of California Floristics and Systematics: Collecting Guidelines and Documentation Techniques. *Madroño* 42(2):197-210.

1) A detailed map of the location and footprint of the proposed project.
2) A detailed description of the proposed project, including one-time activities and ongoing activities that may affect botanical resources.
3) A description of the general biological setting of the project area.

b. Methods, including:
   1) Survey methods for each of the habitats present, and rationale for the methods used.
   2) Description of reference site(s) visited and phenological development of the target special status plants, with an assessment of any conditions differing from the project site that may affect their identification.
   3) Dates of surveys and rationale for timing and intervals; names of personnel conducting the surveys; and total hours spent in the field for each surveyor on each date.
   4) Location of deposited voucher specimens and herbaria visited.

c. Results, including:
   1) A description and map of the vegetation communities on the project site. The current standard for vegetation classification, *A Manual of California Vegetation*[6], should be used as a basis for the habitat descriptions and the vegetation map. If another vegetation classification system is used, the report must reference the system and provide the reason for its use.
   2) A description of the phenology of each of the plant communities at the time of each survey date.
   3) A list of all plants observed on the project site using accepted scientific nomenclature, along with any special status designation. The reference(s) used for scientific nomenclature shall be cited.
   4) Written description and detailed map(s) showing the location of each special status or locally significant plant found, the size of each population, and method used to estimate or census the population.
   5) Copies of all California Native Species Field Survey Forms or Natural Community Field Survey Forms and accompanying maps.

d. Discussion, including:
   1) Any factors that may have affected the results of the surveys (*e.g.*, drought, human disturbance, recent fire).
   2) Discussion of any special local or range-wide significance of any plant population or community on the site.
   3) An assessment of potential impacts. This shall include a map showing the distribution of special status and locally significant plants and communities on the site in relation to the proposed activities. Direct, indirect, and cumulative impacts to the plants and communities shall be discussed.
   4) Recommended measures to avoid and/or minimize direct, indirect, and cumulative impacts.

e. References cited and persons contacted.

f. Qualifications of field personnel including any special experience with the habitats and special status plants present on the site.

[6] Sawyer, J.O. and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society. Sacramento, CA. 471 pp.

PLANT COMMUNITIES IN THE PROJECT AREA

UPLANDS

California Annual Grassland Series (42.040.00). This community is dominated by non-native annual grasses such as ripgut brome (*Bromus diandrus*) and wild oats (*Avena barbata*). Other common species include shortpod mustard (*Hirschfeldia incana*) and yellow star-thistle (*Centaurea solstitialis*), an invasive weed. Areas in and around these grasslands are dominated by saline soils. Annual grasslands are commonly found throughout Contra Costa County. Grasslands provide important foraging, breeding, and resting habitat for many species of wildlife. Annual grasslands occur extensively along the uplands of the Pittsburg Converter Station site. Specifically, this community occurs along portions of the raised berm bordering the BNSF Railroad right-of-way and adjacent to the southern portion of Arcy Lane as it travels north towards New York Slough. Additionally, raised berms bordering the Standard Oil property contain disturbed habitats that can be classified within this community. These raised berms are constructed of fill materials including asphalt, concrete and imported soils. These locations are dominated by invasive weeds such as shortpod mustard, prickly ox-tongue (*Picris echioides*) and tree tobacco (*Nicotiana glauca*). The berms at the Standard Oil property are unlikely to have any significant native seed bank present.

Project area grasslands may attract reptiles such as western fence lizard (*Sceloporus occidentalis*), western skink (*Eumeces skiltonianus*), western whiptail (*Cnemidophorus tigris*), and gopher snake (*Pituophis melanoleucus*). This habitat also attracts seed- and insect-eating birds such as California quail (*Callipepla californica*), mourning dove (*Zenaidura macroura*), savanna sparrow (*Passerculus sandwichensis*), western kingbird (*Tyrannus verticalis*), meadowlark (*Sturnella neglecta*), scrub jay (*Aphelocoma coerulescens*), barn swallow (*Hirundo rustica*), and mockingbird (*Mimus polyglottus*). Small rodents attract raptors (birds of prey), including red-tailed hawks (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), red-shouldered hawks (*Buteo lineatus*), and barn owl (*Tyto alba*). Grasslands are important foraging grounds for aerial and ground foraging insect eaters such as Myotis bat species and pallid bats (*Antrozous pallidus*). Mammals such as gray fox (*Urocyon cinereoargenteus*), California vole (*Microtus californicus*), Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus*), broad-footed mole (*Scapanus latimanus*), California ground squirrel (*Spermophilus beecheyi*), and black-tailed jackrabbit (*Lepus californicus*) forage and nest within these grasslands. The grasslands occurring at the proposed Pittsburg Converter Station cable site are limited in size and have been fragmented by human activities and facilities to a significant degree. This community is regionally and locally common.

Disturbed/Developed Lands. A significant proportion of the property within the proposed Pittsburg and San Francisco cable routes is composed of this landscape. The

northern and western portion of the City of Pittsburg is characterized by large industrial yards and facilities, while the primary drainages, such as Kirker Creek, and other remaining natural areas are characterized by salt marsh, sloughs and other estuarine wetlands. Disturbed and developed areas are largely paved, landscaped and/or contain buildings and infrastructure. Within the project area, these areas include the San Francisco HWC Converter Station site and associated alternative and proposed construction laydown areas and the Pittsburg Standard Oil site, associated alternative access road, and portions of the proposed access road. These areas do not contain any significant native vegetation or natural habitat for biological resources.

WETLANDS AND WATERS

Bulrush Series (52.101.00)*. Stands dominated by California and/or Hardstem bulrush (*Scirpus californicus* and *S. acutus*) occur adjacent to portions of the Pittsburg Converter Station onshore cable route. Hardstem bulrush stands occur adjacent to the east side of Arcy Lane near New York Slough where they are bordered by pickleweed stands and saltgrass adjacent to the existing roadway. California bulrush occurs within the BNSF Railroad right-of-way in at least two other locations within this area. One of these locations is associated with a large seasonal pool with recorded occurrences of endangered vernal pool crustaceans including vernal pool fairy shrimp (*Branchinecta lynchi*) and California linderiella (*Linderiella occidentalis*). The other stand is associated with the red willow wetland that occurs in the northeastern corner of the proposed construction laydown area on the west side of the Delta Energy Center. This plant community would likely be considered a jurisdictional wetland by the U.S. Army Corps of Engineers (USACE). This plant community is considered rare and worthy of consideration by CDFG's California Natural Diversity Database.

Cattail Series (52.103.01). Broadleaf cattail (*Typha latifolia*) dominates portions of wetlands adjacent to the Pittsburg Converter Station onshore cable route, including perennial and seasonal wetlands associated with Kirker Creek. These stands are bordered by seasonal and perennial wetlands dominated by saltgrass (*Distichlis spicata*) and prickle grass (*Crypsis schoenoides*). The cattail stands provide suitable nesting habitat for avian species. This plant community would likely be considered a jurisdictional wetland by the USACE.

Northern Claypan Vernal Pool Series (44.120.00)*. One northern claypan vernal pool was observed along the eastern edge of Arcy Lane approximately five feet from the edge of the existing dirt roadway. This pool is approximately 65 feet long and 30 feet wide and is surrounded by wetlands. This pool is approximately 1.5 feet deep and had a well defined bed. During the late season survey, the pool was dominated by coyote thistle (*Eryngium aristulatum*) a native vernal pool associated plant in the carrot family (Apiaceae). Another vernal pool type seasonal wetland occurs within 0.15 mile of this

Arcy Lane pool within the BNSF Railroad right-of-way. This elongated seasonal pool occurs near Kirker Creek and is mapped within the NDDB as a polygon approximately 0.235 mile long. The seasonal pool has documented occurrences of two vernal pool crustaceans: vernal pool fairy shrimp (Federally Threatened); and California linderiella fairy shrimp (Federal Species of Concern). Impacts to the Arcy Lane pool will be avoided by keeping project activities outside of the pool and within the existing roadway, while impacts to the other seasonal wetland with vernal pool crustaceans will be avoided by constructing the cable route in a paved road south of the railroad easement on Delta Energy Center property. This plant community would likely be considered a jurisdictional wetland by the USACE. This plant community is considered rare and worthy of consideration by CDFG's California Natural Diversity Database.

Pickleweed Series (52.201.00)*. Stands of salt marsh vegetation dominated by pickleweed (*Salicornia virginica*) occur at two locations adjacent to the Pittsburg Converter Station onshore cable route. A small area of pickleweed occurs within the BNSF Railroad right-of-way in a large elongated depression just west of Kirker Creek within the railroad easement. This feature likely receives overflow from Kirker Creek and other oversurface flow from the railroad easement property. Impacts to this stand would be avoided because the cable will be trenched in an existing paved roadway on Delta Energy Center property, just south of the railroad easement. The other, larger and more extensive pickleweed stand is located adjacent to the New York Slough side of Arcy Lane (where proposed trenching is planned). Large pickleweed stands extend right up to the edge of this existing roadway along approximately one hundred yards of this proposed route. These stands are often bordered by bulrush or saltgrass. This salt marsh plant community would likely be considered a jurisdictional wetland by the USACE. This plant community is considered rare and worthy of consideration by CDFG's California Natural Diversity Database.

Saltgrass Series (41.200.00). Seasonal and perennial wetlands dominated by saltgrass occur within the Pittsburg Converter Station onshore cable route. These wetlands occur near Kirker Creek and also adjacent to the northern end of the Arcy Lane roadway closer to New York Slough. Other wetland associated species occurring in this community include fivehook bassia (*Bassia hyssopifolia*) and prickle grass. These communities occurred in seasonal wetlands that appear to pond water during the wet season and had grass covered cracked claybed surfaces during the dry season survey. Portions of this plant community would likely be considered jurisdictional wetlands by the USACE.

Red Willow Series (61.205.00)*. Two stands of red willow occur within the Pittsburg Converter Station alignment. One small stand of red willow occurs within perennial wetlands in the northwestern corner of the proposed construction laydown area for the Pittsburg Converter Station, on the west side of the Delta Energy Center. The willow canopy extends into the BNSF railroad easement and is bordered by saltgrass grassland

and bulrush wetland. Perennial standing water occurs within the proposed laydown area in this location beneath the willow canopy. The other willow forest is located at the eastern end of the BNSF Railroad right-of-way on the north side of the tracks near Kirker Creek and closer to Arcy Lane. This stand will be avoided by the proposed Pittsburg Converter Station cable route. These stands of trees are important wildlife areas. The vegetation provides limited nesting habitat to migratory songbirds such as warblers (Family Emberizidae), vireos (Family Vireonidae), grosbeaks (*Pheucticus* ssp.), and flycatchers (Families Tyrannidae and genus *Empidonax*). This location corresponds to the 1st wetland occurring while traveling from southwest to northeast along the Pittsburg Converter Station route. This plant community would likely be considered a jurisdictional wetland by the Army Corps of Engineers (USACE).

Salt and Brackish Open Water Wetlands and Creeks (52.100.02, 52.200.00). Extensive salt marsh and estuarine wetlands occur adjacent to the Pittsburg Converter Station onshore cable route. One open water channel, Kirker Creek, which drains to Dowest Slough, occurs within the Pittsburg Converter Station proposed onshore cable route between the western corner of the Delta Energy Center property and northwestern corner of the Standard Oil site. Another brackish wetland ditch occurs at a bridge crossing within the Tenth Street Alternative. Brackish and salt marsh open water, ditches and creeks provide resting and foraging habitat for migrating and resident water-dependent birds and other wildlife species. Kirker Creek (freshwater) would also be included in the project area at a second location for the Pittsburg Converter Station. A bridge would be constructed across Kirker Creek on the north side of the Pittsburg-Antioch Highway, this bridge, and associated ramp and entrance road would run in nearly a straight south to north trajectory across the creek and the pilings and bridge supports would be located well up the bank outside of the OHWM. This bridge would be part of the proposed access road for the Pittsburg Converter Station.

These areas are used extensively by wildlife including birds, reptiles and mammals. Surface water is available for a sufficient duration to support aquatic insects, invertebrates and fish. This community is used for foraging, as a source of water for mammals, and as a breeding area for wildlife. Because hydrophytic vegetation, hydric soils and hydrology are present, these wetlands are likely to be considered jurisdictional by the USACE. If the Pittsburg Converter Station route is selected then the jurisdictional status and exact acreage of all potentially jurisdictional features along the route will require a formal verified wetland delineation and final determination by USACE.

SUPPLEMENTAL MARINE SPECIES INFORMATION

FISH

Fish species in the Bay can be divided into several groupings based on life history or habitat requirements. Common species are described briefly below and are organized by group.

Pelagic Fish

Pelagic (i.e., open ocean) schooling fish including topsmelt, northern anchovy, Pacific herring, and Pacific sardine (*Sardinops sagax*) are common and abundant inhabitants of San Francisco Bay. These pelagic species predominantly reside in the upper portions of the water column. Northern anchovy, Pacific herring, and Pacific sardine inhabit coastal waters, in addition to the Bay, while topsmelt predominantly occur within the Bay. Topsmelt, northern anchovy, and Pacific herring represent the most abundant fish species inhabiting the Central Bay regions of the estuary. Northern anchovy are the singlemost abundant fish species collected within the Bay in the CDFG sampling program (Baxter et al., 1999).

- **Pacific Herring (Clupea pallasi).** Pacific herring are the largest commercial fishery in the Bay Area, and the Bay is this species' only significant spawning area south of Puget Sound (Alderdice and Velsen, 1971 in Baxter et al., 1999). Pacific herring migrate into the Bay to spawn from November through March, and spawn adhesive eggs on subtidal and intertidal substrates, preferably eelgrass (*Zostera* spp.). When eelgrass is not available herring can spawn on other marine algal species, as well as substrates such as sand, riprap, and pilings.

  Surveys of Pacific herring spawning activity in the Bay have been conducted since the 1973-1974 reproductive season (Griffin and Cherr, 2001). Data on natural spawn sites show intertidal and nearshore habitat in the northern Central Bay receiving the predominant proportion of herring spawn (Griffin and Cherr, 2001). This area includes San Mateo Point to Fort Point on the west side of the Bay, Alameda to Richmond along the East Bay, and the north tower of the Golden Gate Bridge to Paradise Cove in the northern Central Bay. Since 1980, spawning locations have been primarily restricted to the northern Central Bay from Sausalito to Paradise Cove and on the San Francisco shore from just inside the Golden Gate to Hunters Point (Figure 4.6-2). In years when the northern Central Bay has not predominated as spawn habitat, the southern Central Bay or Oakland/Alameda have been the major recipients of spawn.

- **Northern Anchovy (Engraulis mordax).** Anchovy are found in highest abundance in the Central Bay, and in less abundance in the North. Their primary residence is along California coastal waters, but they migrate into the Bay in late spring for

feeding (USEPA et al., 1996). Although most of anchovy spawning sites are located outside of the Bay, eggs and larvae are commonly found in abundance in the Bay (USEPA et al., 1996). In the Bay, anchovy larvae develop rapidly in the productive shallow habitat before migrating out of the Bay in winter with other adult anchovy. The northern anchovy provide an important food resource for other fish species such as salmon, smelt, and striped bass (Baxter et al., 1999).

- **Topsmelt (Atherinops affinis).** Topsmelt are a schooling fish found in the Bay throughout the year. Topsmelt spawn in the Bay from April to October, with peaks in May and June (Wang, 1986). Topsmelt use mudflats for breeding, spawning, and nursery areas, while sandy subtidal areas are used for nurseries and foraging. Small schools of larvae often occur near the surface of both shallow and open water, making them an important prey item for many piscivorous (fish-eating) birds and fish (Goals Project, 2000).

Elasmobranchs

Members of this fish guild include sharks, rays, and skates. Elasmobranchs are electrosensitive; they use the electric output of organisms in seawater to detect and capture their prey. They are also thought to use the Earth's magnetic field for navigation (Bullock, 1973; Kalmijn, 1982). Only a few species of fish, such as the electric ray (*Torpedo* sp.) and the South American electric eel (*Electrosphorus* sp.) can voluntarily produce electric fields. Although most organisms do not voluntarily produce electric fields, they all emit weak electrical currents through muscle activity. Elasmobranchs can detect the weak electrical field produced by themselves and other organisms. These electrosensitive fish have the potential to detect and respond to the electromagnetic fields potentially produced by submarine cables.

Common Elasmobranch species in the Bay include the leopard shark (*Traikis semifasciatus*), brown smoothhound (*Mustelus henlei*), bat ray (*Mylobatis californicus*), and the spiny dogfish shark (*Squalus acanthias*) (Baxter et al., 1999). Leopard sharks and bat rays extensively use shallow subtidal habitats in the Bay, mostly in the South Bay. The recreational value of these fish makes them important to the charter boat industry, recreational fishing, and public and private aquariums.

Anadromous Fish

Most of the anadromous fish present in the Bay use it as a corridor to migrate up to freshwater spawning grounds. Most anadromous fish species are most abundant in the North Bay, especially in the Sacramento-San Joaquin River Delta area. A number of anadromous fish, including Chinook salmon and steelhead have special status under the

state and/or federal endangered species acts. These listed species are discussed in more detail under Section 4.6.1.3.3.

- **Chinook Salmon (Oncorhynchus tshawytscha) and Steelhead Trout (Oncorhynchus mykiss).** San Francisco Bay's Chinook salmon and steelhead stocks have declined significantly since the turn of the century. Because of these declines, these species are have federal and state special status. These species are discussed in greater detail in Section 4.6.1.3.4.
- **Striped Bass (Morone saxatilis).** Striped bass can be found throughout the Bay, but may be most abundant and spend most time Suisun Bay, the Delta, and surrounding freshwater areas (Goals Project, 2000). Striped bass spawn between May and June in tributaries to the Bay (USEPA et al., 1996). They can tolerate a wide range of environmental conditions including low oxygen and high turbidity (Goals Project, 2000). Young-of-the-year show the highest abundance in the "entrapment zone" of the estuary, the area where fresh and salt water mix. Striped bass were once part of the commercial fishery from 1879 to 1935, and now they are managed exclusively as a recreational fishery (McGinnis, 1984). Adult abundance in the Bay has declined over the years (CDFG, 1992 in Goals Project, 2000), but striped bass remain a very important fish resource for the recreational fishermen, mostly in the North Bay.
- **Sturgeon (Acipenser sp.).** Sturgeon are native fish common in the Bay and they feed on several species of bay shrimp, benthic invertebrates, and herring eggs. The white sturgeon (*Acipenser transmontanus*) is more abundant than the green sturgeon (*Acipenser medirostris*) and is thus an important part of the fishery resource in the Bay.

Rocky Substrate Species

Consisting mainly of various surfperch species (family Embiotocidae) and brown rockfish, these fish depend exclusively on rocky substrates and structures with irregular vertical habitat such as natural rocky outcroppings, sunken boats, bridge piers, and pilings supporting boat docks. These species serve an important role for the shore-based recreational fishery.

Small Demersal Fish

The main fish of this demersal (bottom-dwelling) group include gobies (family Gobiiae), sculpin (family Cottidae), and midshipman (*Porichthys* sp.). These are primarily small fish that spend most of their lives on the bottom of the Bay, generally in shallow waters of the Bay. All of these small demersal fish species provide an important food source for harbor seals and wading birds.

SUPPLEMENTAL MARINE SPECIES INFORMATION

Flatfish

Flatfish comprise fish species that metamorphose from bilaterally symmetrical pelagic larvae (free swimming, "upright" larvae) to asymmetrical bottom-dwelling juveniles (flat and bottom-dwelling) (Baxter et al., 1999). Some of the most common flatfish species found in the Bay are California halibut, English sole, and speckled sanddab.

- **California Halibut (Paralichthys californicus).** Halibut is both a commercially and recreationally important species in the Bay. Its abundance in the Bay has increased corresponding to a general increase in the Bay water temperature over the last 2 decades (Baxter et al., 1999). Halibut juveniles use the shallow Bay subtidal habitat for feeding and rearing of juveniles (Moser and Watson, 1990).

- **English Sole (Pleuronectes vetulus).** Adult English sole spawn from November to May in the shallow coastal areas, mostly in the Central Bay, with some in the South Bay (Wang, 1986; USEPA et al., 1996).

SHRIMP AND CRABS

The Bay is home to many species of shrimp and crab that are important for their recreational value in the fishery, and ecological value in the aquatic food web.

The bay shrimp (*Crangon* spp.) is the most common shrimp reported by the CDFG in the Bay (Baxter et al., 1999). The bay shrimp, along with other shrimp species, are an important food source for virtually all species of fish, marine mammals, and water birds.

The various species of shrimp found in the Bay, while distributed widely throughout the Bay, do have differing centers of distribution. For example, *C. franciscorum* are more commonly collected in the northern reach of the Bay (San Pablo to the west Delta) than in Central Bay, while *C. nigromaculata* is usually found in Central and South Bay, and to a lesser extent, San Pablo Bay (Baxter et al., 1999).

Crabs are both recreationally and ecologically important in the Bay. The most common species in the Bay is the Dungeness crab (*Cancer magister*), which supports an important commercial fishery. Other commonly found species in the Bay include the rock crab, red rock crab, and graceful crab (*C. productus*, *C. antennarius*, and *C. gracilis*), respectively. These species are typically abundant in the more marine waters of the Central Bay but are also found in San Pablo Bay (Baxter et al., 1999).

MARINE MAMMALS

Pacific Harbor Seal (Phoca vitulina richardsi). Harbor seals are the only marine mammals that are permanent residents in the Bay and use mudflats and sandy beaches for

resting and giving birth to pups. Generally, female harbor seals seek isolated, undisturbed areas for pupping and nursing, while all harbor seals use resting areas (called haul-out sites) that are free from frequent disturbance and near channels or open water. Harbor seals are the most common and abundant marine mammal in the Bay. However, censusing harbor seals is problematic because of the fluctuation in population size due to the year, season, tide, time of day, human disturbance, and their frequent travel to the coast and within the Bay. The total population of harbor seals in the Bay was estimated to be between 500 and 700 animals in the mid 1990s (USFWS, 1992; Kopec and Harvey, 1995).

Harbor seals come ashore for resting in between foraging trips and also come ashore during molt to help increase skin temperature and hair development. Females haul-out when giving birth to pups and to allow the pups to suckle and rest. Haul-out sites, therefore, are critical habitats for harbor seals, and they probably choose these sites based on freedom from disturbance and potential predators, proximity to feeding areas and deeper water, stability of substrate, and visibility of approaching terrestrial predators (Kopec and Harvey, 1995). Harbor seals haul-out in groups ranging in size from a few individuals to several hundred seals. Habitats used as haul-out sites include tidal rocks, mudflats, sandbars, and sandy beaches (Zeiner et al., 1990). Haul-out sites are used consistently from year to year and are important habitats for harbor seals (Kopec and Harvey, 1995). Haul-out sites in the Bay are shown in Figure 4.6-2.

In the Bay, pupping occurs from March to June, and molt from June through mid-August (Kopec and Harvey, 1995). These activities correspond to the greatest number of harbor seals counted at major haul-out sites in the Bay (Kopec and Harvey, 1995).

California Sea Lion (Zalophus californianus). California sea lions breed in Southern California and Mexico during June through August, and the males and juveniles migrate up along the California coast during September through May. Most of the California sea lions in the Bay occur there seasonally, and most are juvenile and adult males. They use the Bay for resting and for foraging on seasonally abundant schooling fishes (e.g., anchovies and herring). During anchovy and herring runs, as many as 400-600 sea lions (mostly immature males) enter primarily the North and Central bays to feed (SFEP, 1992). Sea lions have been hauling-out in the San Francisco waterfront area along Pier 39 for a number of years. Aside from the known haul-out site at Pier 39, California sea lions may also haul-out on buoys and other such structures.

Gray Whale (Eschrichtius robustus). Gray whales are protected by the Marine Mammal Protection Act of 1972, and were recently delisted as an endangered species. Gray whales migrate each year along the West Coast of North America, typically passing off the coast of San Francisco heading south from December through February and heading northward

from mid February through July. During the migration, gray whales will occasionally enter rivers and bays along the coast, either because they are disoriented or for foraging.

In the past, gray whales have been seen irregularly in the Bay. More recently, the number of gray whales observed in the Bay appears to have increased. The Sea Training Institute reported two gray whales in the Bay during 1999 and they observed six individuals in the year 2000. The Oceanic Society made an attempt to observe and record reported gray whale sightings in the Bay during Spring 2000. They observed gray whales apparently feeding in a number of areas around the Bay; however, most of the whales were seen near the mouth of the Bay. The recent observations of gray whales feeding in the Bay may be attributed to the recovery of the gray whale population with whales pursuing food sources, such as the benthic invertebrates in the Bay.

Standard Avoidance and Minimization Measures
During Construction Activities in Giant Garter Snake (*Thamnophis gigas*) Habitat

HABITAT TYPE:

Marshes, sloughs, ponds, small lakes, low gradient streams, irrigation and drainage canals, and rice fields. Permanent aquatic habitat, or seasonally flooded during the snake's active season (early-spring through mid-fall), with herbaceous wetland vegetation, such as cattails and bulrushes, grassy banks (often salt grass), and uplands for cover and retreat sites during the snake's active season and for refuge from flood waters during the dormant season (winter). Giant garter snakes are typically absent from larger rivers because of lack of suitable habitat, and from wetlands with sand, gravel, or rock substrates. Some riparian woodlands may not provide suitable habitat because of excessive shade, lack of basking sites, and absence of giant garter snake prey.

AVOIDANCE AND MINIMIZATION MEASURES:

1. Avoid construction activities within 200 feet from the banks of giant garter snake aquatic habitat. Confine movement of heavy equipment to existing roadways to minimize habitat disturbance.

2. Construction activity within habitat should be conducted between May 1 and October 1. This is the active period for giant garter snakes and direct mortality is lessened, because snakes are expected to actively move and avoid danger. Between October 2 and April 30 contact the Service's Sacramento Fish and Wildlife Office to determine if additional measures are necessary to minimize and avoid take.

3. Confine clearing to the minimal area necessary to facilitate construction activities. Flag and designate avoided giant garter snake habitat within or adjacent to the project area as Environmentally Sensitive Areas. This area should be avoided by all construction personnel.

4. Construction personnel should receive Service-approved worker environmental awareness training. This training instructs workers to recognize giant garter snakes and their habitat(s).

5. 24-hours prior to construction activities, the project area should be surveyed for giant garter snakes. Survey of the project area should be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed. Report any sightings and any incidental take to the Service immediately by telephone at (916) 414-6600.

6. Any dewatered habitat should remain dry for at least 15 consecutive days after April 15 and

prior to excavating or filling of the dewatered habitat.

7. After completion of construction activities, remove any temporary fill and construction debris and, wherever feasible, restore disturbed areas to pre-project conditions. Restoration work may include such activities as replanting species removed from banks or replanting emergent vegetation in the active channel.

8. Follow the conservation measures in Table 1 to minimize the effects of loss and disturbance of habitat on giant garter snakes. Replacement ratios are based on the acreage and on the duration of disturbance.

TABLE 1 - SUMMARY OF GIANT GARTER SNAKE CONSERVATION MEASURES

	IMPACTS: DURATION	**IMPACTS:** ACRES	**CONSERVATION MEASURE:** COMPENSATION
LEVEL 1	1 season	Less than 20 and temporary	Restoration
LEVEL 2	2 seasons	Less than 20 and temporary	Restoration plus 1:1 replacement
LEVEL 3	More than 2 seasons and temporary Permanent loss	Less than 20 and temporary Less than 3 acres total giant garter snake habitat AND Less than 1 acre aquatic habitat; OR Less than 218 linear feet bank habitat	3:1 Replacement (or restoration plus 2:1 replacement) 3:1 Replacement

Giant garter snake habitat includes 2.0 acres of surrounding upland habitat for every 1.0 acre of aquatic habitat. The 2.0 acres of upland habitat also may be defined as 218 linear feet of bankside habitat which incorporates adjacent uplands to a width of 200 feet from the edge of each bank. Each acre of created aquatic habitat should be supported by two acres of surrounding upland habitat. Compensation may include creating upland refuges and hibernacula for the giant garter snake that are above the 100-year flood plain.

A season is defined as the calendar year period between May 1 and October 1, the active period

for giant garter snake when mortality is less likely to occur.

ESTIMATED SEDIMENT SOIL HEATING
DUE TO BURIED CABLE UNDER SAN FRANCISCO BAY

The proposed project would install a subsurface HVDC cable from the Pittsburg area to San Francisco. To bring AC power from the generating source to the Pittsburg (Standard Oil) Converter Station, a HVAC cable would be installed in bay sediments. Transmitting electricity though either cable would cause heating of the cable, which in turn would cause heating of the bay sediment surrounding the cable. In situations where the cable must be armored with concrete pillows, warming of the concrete pillows may occur. This appendix presents the methods and results of calculations designed to estimate the potential warming of Bay sediments and concrete pillows from operation of the HVDC and HVAC subsurface cable systems.

Method for Calculating Sediment Temperature Increase

To estimate the increase in temperature of the surface of the bay bottom due to heating from the buried cable, the following assumptions were used.

- Heat transfer occurs primarily in one direction, radially away from the cable.
- Heat transfer at the surface is assumed to be perpendicular to the bottom of the Bay.
- Heat transfer is steady-state.
- Sediment properties are assumed to be homogeneous.
- Initial sediment temperature is equal to the water temperature.
- Water temperature of bay equal 13°C (55°F).
- The sediment above the cable is open to free flow in the bay.

Using these assumptions the temperature in the sediment directly above the center of the cable is:

$$T(r) = \frac{-\Phi o}{2\pi k}\left[\ln(\frac{r}{H}) - \frac{k}{h * H}\right] + T_W \qquad (1)$$

Where:

Φo = heat loss from cable [W/m]

k = conductivity of the sediment [W/mK]

r = radial distance form the center of the cable [m]

H = depth of cable below the surface [m]

h = convective heat transfer coefficient between sediment and water [W/m^2K]

T_W = temperature of the water in the Bay [ºC]

Inputs

Several inputs are needed to estimate the heating of sediment surrounding a buried electrical cable. The values used in the analysis are discussed or listed below.

k = thermal conductivity of sediment was assumed to be 1.5 W/mK. This is representative of saturated clay soils (Peters-Lidard et al. 1998). It is consistent with the value for clay reported by Eckert and Drake, 1972) of 1.279 Watts/mK . Note that this is higher than for water, which is about 0.60 Watts/m°K for both fresh and salt water (Eckert and Drake, 1972, CHRIS, 2005).

h = convective heat transfer coefficient. This value was estimated from the Stanton Number, defined as:

$$St = \frac{h}{\rho c_p u_s} \tag{2}$$

$$= \frac{C_f / 2}{1 + 12.8(P_r^{0.68} - 1)\sqrt{C_f / 2}} \quad \text{(Lienhard and Lienhard, 2006)} \tag{3}$$

where:

ρ = density of bay water (kg/m^3). For a temperature of 13°C (55°F) the density of freshwater water is 1000 kg/m^3 and for seawater with a salinity of 32 ppt it is 1024.1 kg/m^3.

c_p = heat capacity of water (Ws/Kg°K). The heat capacity is a function of temperature and salinity. For freshwater at 13°C the heat capacity is about 4,189 Ws/kg°K and for seawater at the same temperature it is 3906 Ws/kg°K (CHRIS, 2005).

u_s = water velocity in bay above cable (m/s). This value varies throughout the bay and with the tides but is usually less than 1 m/s.

C_f = local friction coefficient = $\frac{0.455}{[\ln(0.06 R_{ex})]^2}$ (4)

R_{ex} = local Reynolds number = $u_s L/\nu$. This is about 1 to 1.5 x 10^6 in the bay.

ν = viscosity of water (m^2/s) = 1.14e-6 (m^2/s). Viscosity varies by salinity by a small amount

L = length scale (m).

Equation 4 used to calculate the convective heat transfer coeffcient is valid for smooth walls. For rough walls or surfaces there may not be a viscous or thermal sublayer within the boundary layer. However, the absence of this sublayer results in increased heat transfer. Using Equations 2, 3, and 4, the heat transfer coefficient is:

$$C_f = \frac{0.455}{[\ln(0.06 * 1.0E-6)]^2} = 1.64E-03$$

$$S_t = \frac{1.64e-03/2}{1+12.8(7.1^{0.68}-1)\sqrt{1.64E-03/2}} = 4.05E-04$$

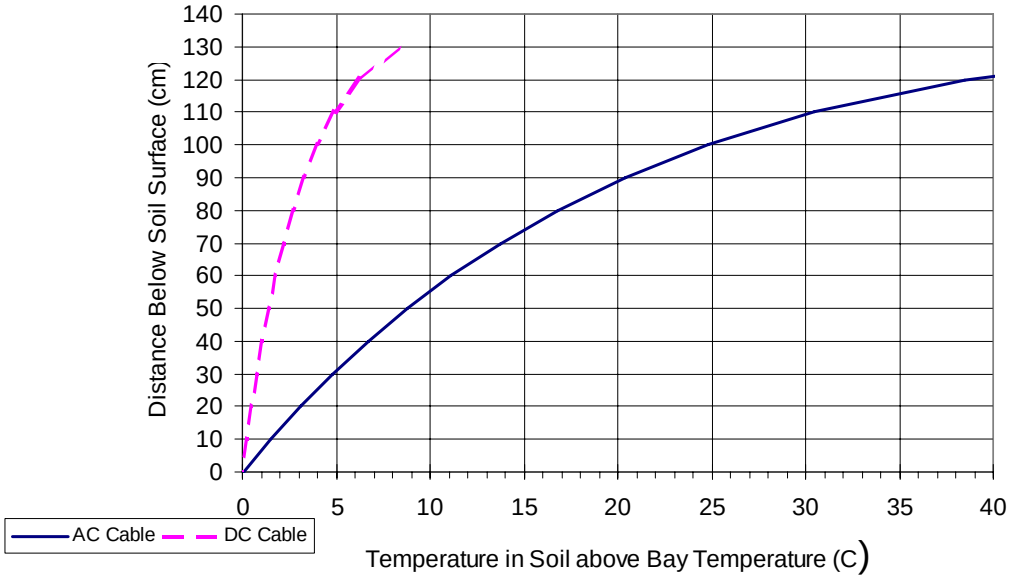
$$St * \rho c_p u_s = h = 4.05E-04 * 1024 * 1974.8 * .5 = 409.8 W/m^2 K$$

Φo = heat loss from the surface of the AC cable is assumed to be 26 W/m and from the DC cable 16W/m

Results

Results of the analysis are shown in Figure 1. The results indicate minimal heating of the sediment surface above the cable. This is primarily due to the relatively high convective heat transfer coefficient at the sediment-water interface. The rate of heating below the surface is strongly influenced by the conductivity of the soil. An assumption of a lower conductivity of the sediment (e.g., the same as water, 0.60 W/mK) would result in a steeper temperature gradient and more heating of the sediment (e.g., about twice assuming conductivity is the same as water). However, as long as the convective heat transfer coefficient is high there will be minimal heating of the sediment surface.

Figure 1 Heating of Soil Above Electrical Above Cable Buried Below the Bay



Method and Results for Concrete Pillows

The following assumptions were used to estimate the heating of the concrete pillows.

- The concrete would be 0.50 meters thick.
- Heat loss from the cable is the same as for the buried cable, i.e., 30W/m for the DC cable.

- Thickness of the cable is 0.125 m (~ 5 inches).
- The water directly surrounding the cable (i.e., trapped underneath the concrete pillows) is at the same temperature as the cable. This assumes that there is no significant flow of water underneath the pillows.
- The concrete pillows are in the open bay and exposed to flowing water.
- Heat flow is in one dimension.

Using the above assumptions the temperature in the concrete pillows for the DC cable is:

$$T = \Theta o\left(\frac{l-x}{2\pi k_c r_o} + \frac{\alpha}{wh}\right) + Tw$$

where the variables are the same as above plus:

l = thickness of the pillows (m). They are assumed to be 0.5 meters thick.

x = distance in the block above the cable surface.

k_c = conductivity of the concrete [W/mK]. This value varies from 0.81 to 1.4 W/mK (Eckert and Drake, 1972). A value 0.81 W/mK was used.

r_o = radius of cable. Assumed to equal 0.125 meters (~5 inches).

Using the above data and assumptions the surface of the concrete should be les than 1 °C above the ambient water temperature.

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APPENDIX G CULTURAL RESOURCES TECHNICAL REPORT

This appendix presents the following cultural resources related technical reports:

- Archaeological Investigation, Trans Bay Cable Project, Contra Costa, Marin, San Francisco, and Solano Counties, California (URS, 2006)
- Historical Resources Inventory and Evaluation Report, Pittsburg/San Francisco Trans Bay Cable Project (URS, 2005)

ARCHAEOLOGICAL INVESTIGATION, TRANS BAY CABLE PROJECT, CONTRA COSTA, MARIN, SAN FRANCISCO, AND SOLANO COUNTIES, CALIFORNIA

Mark R. Hale
Project Archaeologist

With contributions by
Brian Hatoff
Senior Project Archaeologist

Joanne Grant
Staff Archaeologist

and

Christopher Lee
Staff Archaeologist

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URS Corporation

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1.0 INTRODUCTION

The Trans Bay Cable (TBC) Project is being developed by Trans Bay Cable LLC, an affiliate of Babcock & Brown Power Operating Partners LLC, in cooperation with the City of Pittsburg, California. The Project is proposed to transmit electrical power and provide a dedicated connection between new and efficient generation in the East Bay, which has excess electrical capacity and transmission grid congestion, and the electrical transmission and distribution facilities in San Francisco. The primary goal of the Project is to deliver generator-like electric capacity and energy to San Francisco to meet demand projected for the period 2008 and beyond.

The proposed TBC Project will install a High Voltage Direct Current (HVDC) cable in San Francisco Bay, connecting existing substations near the City of Pittsburg, Contra Costa County, and in the City and County of San Francisco near Potrero Point (a distance of approximately 55 miles between substations). The Project requires construction of converter stations at both Pittsburg and Potrero; the location of the Pittsburg converter station will add an additional 4 miles of both AC and DC cables to the Project. The HVDC cable will be laid under San Francisco Bay in water as deep as possible and at depths generally planned between 3 and 6 feet below the bay bottom.

The proposed Project consists of the following major components:

- Approximately 57 miles of submarine HVDC cable transmitting up to 400 megawatt (MW) of electrical power using 400 kilovolt (kV) DC from Pittsburg to San Francisco
- Proposed 7.5-acre Converter Station site in Pittsburg (AC/DC)
- Proposed 5.6-acre Converter Station site in San Francisco (DC/AC)
- A short segment of AC interties between the proposed converter stations and the existing electrical substations, i.e., the Pacific Gas and Electric (PG&E) 230 kV Pittsburg Substation in the East Bay and the PG&E Potrero 115 kV substation in San Francisco
- Connections to the existing PG&E Pittsburg and Potrero substations

The cable alignment would extend from the PG&E Pittsburg Substation near Pittsburg, California to the PG&E Potrero Substation in San Francisco. The overall alignment is shown in Figure 1; details are shown in Figure 2, Sheets 1 through 10. The proposed HVDC transmission line between the two terminals consists of a transmission cable, a separate medium voltage (MV) metallic return cable, and a fiber optic communication cable. The 400 MW 400 kV transmission cable will be approximately 4.5 inches in diameter; the MV return cable will be approximately 3.5 inches in diameter. The fiber optic cable, required for transmission-related communications between the converter stations, will be

approximately 1 inch in diameter. The combined bundle of three cables will be approximately 10 inches in diameter.

The cable system will be buried underwater and routed from the Pittsburg Converter Station into the water at Honker Bay and Suisun Bay (New York Slough), through the Carquinez Strait, San Pablo Bay, and San Francisco Bay to a landing point near the San Francisco-based converter station.

2.0 REGULATORY SETTING

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, or scientific importance. Numerous laws, regulations, and statutes, on both the federal and state levels, seek to protect and target the management of cultural resources.

2.1 Federal Regulations

Antiquities Act (1906). The federal government formally recognized the importance of some cultural resources with passage of the 1906 Antiquities Act, 16 United States Code (USC) 431-433. This act, with its applicable regulation in 43 Code of Federal Regulations (CFR) 3, protects all historic and prehistoric sites on federal lands and prohibits excavation or destruction of such antiquities unless a permit (Antiquities Permit) is obtained from the Secretary of the federal agency that has the jurisdiction over those lands. It also authorizes the President to declare areas of public lands as National Monuments and to reserve or accept private lands for that purpose.

Historic Sites Act (1935). The Historic Sites Act, regulated at 16 USC 461 et seq., declares a national policy to preserve historic sites, buildings, antiquities, and objects of national significance, including those located on refuges. The Historic Sites Act provides procedures for designation, acquisition, administration, and protection of such sites.

Reservoir Salvage Act, as Amended (1960). The Reservoir Salvage Act, regulated at 16 USC 469-469c, recognized that federally constructed reservoirs represented a major source of destruction of archaeological resources that could not be resolved without a specific source of funding. In 1974, the Reservoir Salvage Act was amended by the Archaeological and Historic Preservation Act (see below). In effect, the Archaeological and Historic Preservation Act extended the provisions of the Reservoir Salvage Act to cover all federal construction activities and all federally licensed or assisted activities that cause loss of scientific, prehistoric, or archaeological data. The Reservoir Salvage Act requires federal agencies building or permitting the building of reservoirs to notify the Secretary of the Interior when such activities might destroy important archaeological, historic, or scientific data. The

Secretary of the Interior is authorized to conduct appropriate investigations to protect those archaeological data. The act also authorizes agencies to spend up to 1 percent of their construction funds on the protection of historic and archaeological resources. This is the first act to recognize that archaeological sites are important for their data content and to provide a source of funding for collecting archaeological data.

National Historic Preservation Act, as Amended (1966). The National Historic Preservation Act (NHPA) declares federal policy to protect historic sites and values in cooperation with other nations, states, and local governments. The NHPA establishes a program of grants to assist states for historic preservation activities. Subsequent amendments designated the State Historic Preservation Officer (SHPO) as the individual responsible for administering state-level programs. The act also created the President's Advisory Council on Historic Preservation (ACHP). Federal agencies are required to consider the effects of their undertakings on historic resources and to give the ACHP a reasonable opportunity to comment on those undertakings. A lead federal agency will be responsible for project compliance with Section 106 of the NHPA and its implementing regulations, set forth by the ACHP at 36 CFR 800.

National Environmental Policy Act, as Amended (1969). Under the National Environmental Policy Act (NEPA), 42 USC Sections 4321-4327, federal agencies are required to consider potential environmental impacts and appropriate mitigation measures for projects with federal involvement. If the project has federal involvement (e.g., a 404 permit), the lead federal agency will be responsible for project compliance with Section 106 of the NHPA and its implementing regulations, set forth by the ACHP at 36 CFR 800.

Archaeological and Historic Preservation Act (1974). Under 16 USC 469-469c, the Archaeological and Historic Preservation Act (AHPA) requires federal agencies to provide notice to the Secretary of the Interior of any dam constructions and, if archaeological resources are found, for recovery or salvage of them. The law applies to any agency whenever it received information that a direct or federally assisted activity could cause irreparable harm to prehistoric, historic, or archaeological data. Up to 1 percent of project funds could be used to pay for salvage work. The NHPA also authorized additional funding to be availed for this purpose.

American Indian Religious Freedom Act (1978). The American Indian Religious Freedom Act, 42 USC 1996, et seq., regulated under 43 CFR 7, has been established to protect religious practices, ethnic heritage sites, and land uses of Native Americans. The act makes it a policy to protect and preserve for American Indians, Eskimos, Aleuts, and Native Hawaiians their inherent right of freedom to believe, express, and exercise their traditional religions. The act allows them access to sites, use and possession of sacred objects, and freedom to worship through ceremonial and traditional rights. It

further directs various federal departments, agencies, and other instrumentalities responsible for administering relevant laws to evaluate their policies and procedures in consultation with Native American traditional religious leaders to determine changes necessary to protect and preserve Native American cultural and religious practices.

Archaeological Resources Protection Act (1979). The Archaeological Resources Protection Act (ARPA) supplements the provisions of the Antiquities Act of 1906, and declares it illegal to excavate or remove from federal or Native American lands any archaeological resources without a permit from the land manager (or federal agency with jurisdiction over those lands). Permits may be issued only to educational or scientific institutions and only if the resulting activities will increase knowledge about archaeological resources. Major penalties for violating the law are included. Regulations found at 43 CFR 7 state that the ultimate disposition of materials recovered as a result of permitted activities excavated from public lands remain the property of the United States. Those excavated from Indian lands remain the property of the Indian or Indian tribe having rights of ownership over such resources.

Native American Graves Protection and Repatriation Act (1990). The Native American Graves Protection and Repatriation Act (NAGPRA), 25 USC 3001 et seq., defines cultural items, sacred objects, and objects of cultural patrimony, and establishes ownership hierarchy for remains found on federal lands. It also provides for specific case review, allows excavation of human remains, and stipulates return of the remains according to ownership. NAGPRA also sets penalties for violations of the act, calls for cultural resource inventories, and has provisions for the return of specified cultural items to the appropriate Native American tribe(s) and/or Native Hawaiian organization(s). NAGPRA is initiated when the project and the finds are situated on federal lands.

2.2 Relevant Federal Regulations Pertaining to Underwater Cultural Resources

It is important to note that federal-level mandates also cover underwater cultural heritage, including submerged prehistoric sites. These legislative acts would be pertinent in instances where near-shore or offshore cultural resources are detected during project construction or related activities. Although originally intended to address terrestrial resources, the Antiquities Act of 1906 and the ARPA of 1976 cover underwater cultural heritage, to a certain extent. The ARPA of 1976, which superceded the Antiquities Act of 1906, is applicable only if the underwater cultural resources are found on lands owned by the federal government.

The acts cited below, although federal-level, also apply to resources in state waters. As such, these acts are concurrently relevant for both federal and state-level projects.

Submerged Lands Act (1953). This act is largely superceded by the Abandoned Shipwreck Act, but has been used by states to protect abandoned historic shipwrecks by citing various state-level historic preservation laws. The Submerged Lands Act established state jurisdiction over offshore lands within 3 miles of shore (or 3 marine leagues for Texas and the Gulf coast of Florida). The Act did reaffirm the federal claim to the Outer Continental Shelf, which consists of those submerged lands seaward of state jurisdiction. However, the act limited states' claims to the submerged lands inside the landward boundary of the Outer Continental Shelf. Several federal courts rejected state positions on historic preservation laws, for various reasons, that pertained to shipwrecks within this 3-mile zone. Judicial conclusions from cases involving the Submerged Lands Act were inconsistent and confusing, yet shipwrecks in state waters were still at risk from damage and destruction. These circumstances provided the momentum for the passage of the Abandoned Shipwreck Act.

Abandoned Shipwreck Act (1987). The Abandoned Shipwreck Act, 43 USC 2101–2106, is a federal-level legislative act but it does protect shipwrecks found in state waters. The Abandoned Shipwreck Act also states that the laws of salvage and finds do not apply to abandoned shipwrecks protected by the act. Under the Abandoned Shipwreck Act, the United States asserts title to abandoned shipwrecks located within state waters that are either:

(a) Embedded in state-submerged lands,

(b) Embedded in the coralline formations protected by a state on submerged lands, or

(c) Resting on state-submerged lands and are either included in or determined eligible for the National Register of Historic Places.

The Abandoned Shipwreck Act also has a provision for the simultaneous transfer, by the federal government, of title for those abandoned shipwrecks to the state(s) in whose waters the wrecks are located.

2.3 State Regulations

In California, cultural resources include archaeological and historical objects, sites and districts, historic buildings and structures, cultural landscapes, and sites and resources of concern to local Native American and other ethnic groups. Compliance procedures are set forth in the California Environmental Quality Act (CEQA) Sections 15064.5 and 15126.4. The primary applicable state laws and codes are presented below.

California Native American Graves Protection and Repatriation Act (2001). In the California Health and Safety Code, Division 7, Part 2, Chapter 5 (Sections 8010-8030), broad provisions are made for the protection of Native American cultural resources. The act sets the state policy to ensure that all California Native American human remains and cultural items are treated with due respect and dignity. The act also provides the mechanism for disclosure and return of human remains and cultural items held by publicly funded agencies and museums in California. Likewise, the act outlines the mechanism with which California Native American tribes not recognized by the federal government may file claims to human remains and cultural items held in agencies or museums.

California Public Resources Code, Section 5020. This California code created the California Historic Landmarks Committee in 1939, and authorizes the Department of Parks and Recreation to designate Registered Historical Landmarks and Registered Points of Historical Interest.

California Public Resources Code, Section 5097.9. Procedures are detailed under California Public Resources Code (PRC) Section 5097.9 for actions taken whenever Native American remains are discovered. No public agency, and no private party using or occupying public property, or operating on public property, under a public license, permit, grant, lease, or contract made on or after July 1, 1977, shall in any manner whatsoever interfere with the free expression or exercise of Native American religion as provided in the U.S. Constitution and the California Constitution; nor shall any such agency or party cause severe or irreparable damage to any Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine located on public property, except on a clear and convincing showing that the public interest and necessity so require. The commission, pursuant to Sections 5097.94 and 5097.97, shall enforce the provisions of this chapter.

California Public Resources Code, Section 7050.5. Every person who knowingly mutilates or disinters, wantonly disturbs, or willfully removes any human remains in or from any location other than a dedicated cemetery without authority of law is guilty of a misdemeanor, except as provided in Section 5097.99 of the Public Resources Code. In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined the remains to be archaeological. If the coroner determines that the remains are not subject to his or her authority and if the coroner recognizes the human remains to be those of a Native American, or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission.

California Public Resources Code, Section 7051. Every person who removes any part of any human remains from any place where it has been interred, or from any place where it is deposited while

awaiting interment or cremation, with intent to sell it or to dissect it, without authority of law, or written permission of the person or persons having the right to control the remains under Section 7100, or with malice or wantonness, has committed a public offense that is punishable by imprisonment in the state prison.

Administrative Code, Title 14, Section 4307. Under this state preservation law, no person shall remove, injure, deface, or destroy any object of paleontological, archaeological, or historical interest or value.

2.4 Significance Criteria

Federal Significance Criteria

The four evaluation criteria to determine a resource's eligibility to the NRHP, in accordance with the regulations outlined in 36 CFR 800, are identified at 36 CFR 60.4. These evaluation criteria, listed below, are used to help determine what properties should be considered for protection from destruction or impairment resulting from project-related activities (36 CFR 60.2).

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

(a) Resources that are associated with events that have made a significant contribution to the broad patterns of our history; or

(b) Resources that are associated with the lives of persons significant in our past; or

(c) Resources that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) Resources that have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

State Significance Criteria

In considering impact significance under CEQA, the significance of the resource itself must first be determined. At the state level, consideration of significance as an "important archaeological resource" is

measured by cultural resource provisions considered under CEQA Sections 15064.5 and 15126.4, and the draft criteria regarding resource eligibility to the California Register of Historic Resources (CRHR).

Generally under CEQA, a historical resource (these include built-environment historic and prehistoric archaeological resources) is considered significant if it meets the criteria for listing on the CRHR. These criteria are set forth in CEQA Section 15064.5 and defined as any resource that:

(d) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

(e) Is associated with lives of persons important in our past;

(f) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

(g) Has yielded, or may be likely to yield, information important in prehistory or history.

Section 15064.5 of CEQA also assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. These procedures are detailed under California PRC Section 5097.98.

Impacts to "unique archaeological resources" and "unique paleontological resources" are also considered under CEQA, as described under PRC 21083.2. A unique archaeological resource implies an archaeological artifact, object, or site about which it can be clearly demonstrated that—without merely adding to the current body of knowledge—there is a high probability that it meets one of the following criteria:

(a) The archaeological artifact, object, or site contains information needed to answer important scientific questions, and there is a demonstrable public interest in that information;

(b) The archaeological artifact, object, or site has a special and particular quality, such as being the oldest of its type or the best available example of its type; or

(c) The archaeological artifact, object, or site is directly associated with a scientifically recognized important prehistoric or historic event or person.

A non-unique archaeological resource indicates an archaeological artifact, object, or site that does not meet the above criteria. Impacts to non-unique archaeological resources and resources which do not qualify for listing on the CRHR receive no further consideration under CEQA.

Under CEQA Section 15064.5, a project potentially would have significant impacts if it would cause substantial adverse change in the significance of one of the following:

(a) A historical resource (i.e., a cultural resource eligible for the CRHR)

(b) An archaeological resource (defined as a unique archaeological resource which does not meet CRHR criteria)

(c) A unique paleontological resource or unique geologic feature (i.e., where the project would directly or indirectly destroy a site or resources)

(d) Human remains (i.e., where the project would disturb or destroy burials)

A non-unique archaeological or paleontological resource is given no further consideration, other than the simple recording of its existence, by the lead agency.

Conformity of Federal and State Evaluation Criteria

The criteria for eligibility for the CRHR are very similar to those that qualify a property for the National Register of Historic Properties (NRHP), which is the significance assessment tool used under the NHPA. The criteria of the NRHP apply when a project has federal involvement.

A property that is eligible for the NRHP is also eligible to the CRHR. All potential impacts to significant resources under a federal agency must be assessed and addressed under the procedures of Section 106 of the NHPA, set forth at 36 CFR 800. All resources encountered during the project, with the exception of isolate artifacts and isolate features that appear to lack integrity or data potential, will be evaluated for significance vis-à-vis Section 106.

3.0 ENVIRONMENTAL SETTING

The TBC project area is located primarily beneath the waters of San Francisco, San Pablo, Suisun, and Honkers Bays and the adjoining waterway of the Carquinez Strait. Together, these waters comprise the San Francisco Bay Estuary.

In addition to the submarine segment, the project includes three terrestrial components, one near the tip of the San Francisco Peninsula and two others along the shores of the Sacramento-San Joaquin River Delta. Given differences in the settings of these project components, separate discussions of each are presented below.

3.1 San Francisco Peninsula

Natural Environment

The proposed and alternative San Francisco converter station sites and the onshore AC cable route are situated in the northeast portion of the San Francisco Peninsula, which is located in the Coast Range geomorphic province. Within the City of San Francisco, the dominant northwesterly trend of ridges and valleys characteristic of the Coast Ranges is obscured, except for relatively minor features such as Russian and Telegraph Hills. The San Francisco Peninsula lies within a down-dropped structural block bounded by the East Bay Hills and the Santa Cruz Mountains (Sedlock 1995).

The region now encompassed by the City of San Francisco has witnessed a substantial degree of human alteration, making an accurate depiction of the native environment difficult. Currently, the entire project area is developed, with the greatest portion covered by asphalt and industrial structures.

The native vegetation of the Project area was likely comprised of the Northern Coastal Scrub and Coastal Prairie communities as defined by Munz and Keck (1973). The Northern Coastal Scrub community is characterized by rather low plants rarely over 6 feet in height, sometimes dense, but often with extensive areas of grass (Munz and Keck 1973:13). The Coastal Prairie community is characterized by open temperate hill-grasslands or glades or bald hills, which occur predominantly below 4,000 feet (Munz and Keck 1973:17). In addition, it is likely that riparian vegetation occurred within the various drainages and draws that were found within the confines of the city. Today, remnants of the native vegetation (e.g., California poppy, lupine) can be observed in isolated areas of San Francisco, although the original bunch grasses have been replaced by introduced weedy grasses.

Wildlife within the project area is limited to birds; however, harbor seals (*Phoca vitulina*) and California sea lions (*Zalophus californicus*) still frequent the nearby waters of San Francisco Bay. Birds observed during the field activities included gulls (*Larus* spp.) and cormorant (*Phalacrocorax* spp.). Prior to Euro-American settlement of the area, it is probable that black-tailed deer (*Odocoileus hemionus*), tule elk (*Cervus elaphus*), and grizzly bear (*Ursus arctos*) occasionally inhabited the vicinity. In addition to the harbor seals and California sea lion, sea otters (*Enhydra lutris*) likely once utilized the adjacent shoreline areas.

Prehistoric Background

Human settlement of the San Francisco Bay region probably began sometime during the early Holocene period ca. 10,000 years ago. During this period, the mean sea level elevation was considerably lower than today and the area now encompassed by the San Francisco Bay was over 30 miles inland from the coastline. Sea levels rose and, by 8,000 years ago, marine waters began to inundate San Francisco Bay. Except for brief periods, the mean sea level has been at or above its present level for some 6,000 years (Moratto 1984:221-223).

The oldest evidence of human occupation is documented in northern Santa Clara County, where radiocarbon assaying has yielded dates of circa 8000 B.C. Evidence for later occupations, however, is more common. Radiocarbon dates from several sites within the areas surrounding and between the San Francisco and Monterey bays range between circa 5000 and 2000 B.C. Data from these sites indicate that extensive but sparse populations of hunter-gatherers occupied these areas before 2000 B.C. Sites from this period are located within the interior hills and valleys and on the bay and ocean shores. These sites are characterized by earth and/or sand midden deposits. Faunal materials indicate that shellfish were an important, but not dominant, source of food during this time. Hunting and vegetal food processing were of greater importance, as indicated by the presence of millingstones and large projectile points.

Archaeological investigations in the San Francisco Bay Area have generally concentrated on the littoral regions bordering the bay. The first detailed survey of the Bay Area was by N. C. Nelson from 1906-1908 along the coast from Half Moon Bay to the Russian River (Nelson 1909). This survey resulted in the documentation of 425 midden deposits including Ca-SFr-7 near Hunters Point.

Early excavations concentrated on large shellmound sites. Prior to Nelson's survey work, Uhle carried out excavations at the Emeryville site (Ala-309) in 1902, and in 1924, W. E. Schenck conducted salvage operations at this site. The Emeryville site is a two-component habitation area that yielded almost 700 human burials. The lower strata were characterized by non-obsidian lithics, flexed burials, red ochre, and a high frequency of bay oyster shells relative to bent-nosed clams. A radiocarbon date of 2310 ± 220 years was obtained from the mound base. Upper strata cultural debris included flaked obsidian artifacts, cremations, polished stone implements, and a high frequency of bent-nosed clams, relative to bay oysters (Moratto 1984:227-229).

The Ellis Landing site (CCo-295) was excavated by Nelson from 1906 through 1908. He eventually recovered 160 burials from this large habitation site and identified two cultural components. The lower component was characterized by spatulate bone objects, triangular and rectangular *Haliotis* ornaments, red ochre, cobble mortars, large non-stemmed points, and *Olivella* saucer and saddle beads. The upper

component was defined by perforated charmstones, incised bone tubes, stemmed points, and mortars with flared sides (Moratto 1984:230-231).

The Fernandez site is a large shellmound located approximately five miles inland. It was first excavated by Nelson in 1910 and subsequently by L. Barker in 1935, R. Heizer in 1938, D. Perryman in 1958, and J. Davis in 1959. Three cultural strata were identified at this site, designated Components A, B, and C. Component C, the basal stratum, was characterized by *Olivella* saddle beads, perforated charmstones, large circular *Haliotis* ornaments, and red ochre with flexed burials. Component B, the central stratum, contained thin, rectangular *Olivella* beads, variously shaped large *Haliotis* ornaments, and cremations. Component A, the upper stratum, contained clamshell disk beads, cylindrical magnesite and steatite beads, tubular stone pipes, and baked clay balls, all of which were associated with cremations. A radiocarbon date of 230 B.C $\pm$ 250 years was obtained from material associated with Component C (Moratto 1984:231).

Data from the excavations presented above, as well as subsequent excavations, were used to extend the Central California Taxonomic System (CCTS) classifications of the Central Valley cultures to include those in the San Francisco Bay area (Beardsley 1954). One feature of the CCTS is the designation of "horizons," broad cultural units with temporal characteristics. The system recognizes three cultural horizons: Early, Middle, and Late. Each cultural horizon is defined by groups of diagnostic traits and characteristic artifacts called facies. Groups of facies comprise a province. The facies and province were defined both culturally by characteristic traits and artifacts, as well as spatially by the locales where the facies were found. For example, the lower strata at the Middle Horizon site CCo-295 were used by Beardsley as diagnostic of the Ellis Landing Facies. The upper strata are assigned to the Emeryville Facies. Both of these facies are part of the Coastal Province. Component B at the Fernandez site (CCo-259) was designated to be characteristic of the Emeryville Facies, Component C characteristic of the Ellis Landing Facies, and Component A was designated as containing the assemblages and characteristics diagnostic of the Late Horizon Fernandez Facies.

The CCTS has been criticized as being too simplistic to represent the high complexity and variability of central California prehistory (Gerow and Force 1968). Fredrickson (1973) attempted a revision of the central California sequence, identifying three broadly defined "patterns" in place of the CCTS horizons. The Windmiller Pattern (3000 to circa 500 B.C.) is characterized by a commonality of mortar fragments, large numbers of baked clay balls, large quantities of projectile points, tridentate fish spears, *Haliotis* ornaments, and *Olivella* beads, as well as ground and polished charmstones of alabaster, marble, and diorite. The Windmiller culture did exist in the San Francisco Bay Area, but was more common in the delta area to the east and northeast (Moratto 1984:201-207).

The Berkeley Pattern (ca. 500 B.C. to A.D. 500) replaces the Middle Horizon, with which it shares major characteristics. These characteristics include predominance of non-stemmed points, diagonally flaked, large concave-based points, greater presence of ground stone than in Windmiller Pattern sites, a highly developed bone industry, and flexed burials, as well as some cremations. A major characteristic is the great reliance placed upon acorns for subsistence (Moratto 1984:209-211).

Fredrickson (1973) replaces the Late Horizon with the Augustine Pattern (ca. A.D. 500 to contact), characterized by intensive hunting, fishing, and gathering. Acorns are a main staple. Other characteristics are large, high-density populations, shaped mortars and pestles, bone awls, and the bow and arrow. Burial practices vary with social status. High-status individuals may have been cremated. Other burial practices include flex interment and burning of artifacts in the grave (prior to interment) (Moratto 1984:211-214).

Sometime between 2500 and 2000 B.C., Utian-speaking peoples initially occupied what is now eastern Contra Costa County and then expanded westward to the San Francisco Bay. Between the years 2000 and 1000 B.C. bayshore- and marsh-adapted peoples began to settle in the Bay Area at sites such as CCo-308. By circa 1500 B.C., Utian people had settled the area around the south end of San Francisco Bay, from which they expanded to the north, west, and south. By circa 500 B.C., Costanoan peoples occupied essentially the same territory that they would until Euro-American contact (Moratto 1984:279).

Ethnographic Background

The entire Project area, including the proposed transmission corridor, is situated within lands occupied during the ethnographic period by speakers of Ramaytush or San Francisco Costanoan. Ramaytush is one of eight Costanoan Indian languages spoken in California. Costanoan is derived from the Spanish term *costanos* for "coast people"; however, it does not represent a cohesive ethnic group. Instead, Costanoan is a linguistic division, grouping eight languages together due to their phonological similarities. Together with the Miwokan languages, Costanoan comprises the Utian Family of languages. In turn, the Utian Family is part of the larger Penutian Linguistic Stock (Kroeber 1976; Levy 1978a; Moratto 1984; Shipley 1978).

The territory inhabited by Costanoan peoples extended from the Carquinez Strait southward to the Sur River and from the Pacific coast eastward to the Diablo Range (Kroeber 1976:462; Moratto 1984:225). This area was significantly affected by the Spanish presence in California. Between 1769 and 1776, seven Spanish expeditions entered the Costanoan lands and, by the close of the eighteenth century, seven missions had been established. At the time of these early contacts approximately 10,000 Costanoan Indians existed, inhabiting roughly 50 politically autonomous tribelets. By 1832, the Costanoan population had declined to less than 2,000 individuals. This precipitous drop was primarily

due to introduced diseases to which the Costanoan had no natural immunity. Most of the surviving population relocated to the missions; however, some Costanoan sought and received refuge among neighboring aboriginal groups (Cook 1943a; 1943b).

The "missionized" Costanoan were often forced to assimilate with individuals of other ethnic and/or linguistic affiliations, resulting in the disruption of Native lifeways. This led to a relatively large gap in our understanding of their aboriginal culture. Fortunately, the journals of Spanish explorers and padres, along with the records from the missions, contain valuable data which provide insights into pre-contact lifeways (e.g., Bolton 1930; Palou 1924).

The Costanoan, like most aboriginal Californians, possessed no larger political organization than the tribelet. Their tribelets were generally composed of one or more loosely affiliated villages and associated logistical camps situated within a recognized territory. Tribelet leadership was inherited patrilineally, generally passing from father to son, although women could also hold the office (Levy 1978a:487).

Costanoan peoples engaged in trade among themselves and with Miwok and Yokuts tribelets inhabiting areas to the north and east of their territory. Davis (1961) identifies various coastal commodities (e.g., shellfish and salt) as their exports. Relations between the various Costanoan groups or with their neighbors were not always friendly. Skirmishes often occurred on a small scale; however, they were not bloodless. Prisoners, if taken, would be quickly dispatched and the heads of the fallen foes would be displayed with pride (Kroeber 1976:468-467; Levy 1978a:488).

The subsistence strategy of the Costanoan peoples revolved around the procuring of wild vegetal and animal foodstuffs. Vegetal products were gathered as they became seasonally available, and then were either consumed or stored for future use. Acorns, if regularly available, were the staple plant food. If a particular tribelet inhabited an area devoid of oaks (e.g., the coast), then seed procurement predominated (Kroeber 1976:467; Levy 1978a:491).

Mammals procured for consumption included black-tailed deer, elk, pronghorn antelope, sea lion, cottontail rabbit, jackrabbit, tree squirrel, ground squirrel, and numerous other small rodents. Birds were also frequently taken, with waterfowl being the most important to the Costanoan diet (Kroeber 1976:467; Levy 1978a:491). Meat was generally obtained through hunting; however, it was reported (Palou 1924:62-63) that stranded sea mammals, including whales, were scavenged for their flesh. Standard hunting equipment included the bow (both sinew-backed and self-bows) and arrow, clubs, dead falls, nets, traps, and bolas (Levy 1978a:491-493).

Fish and mollusks were a significant component of the diet. Salmonids (i.e., steelhead and salmon) were captured during their spawning migrations by hook and line or seine nets. Mussels and abalone were simply pried from the coastal rocks. Kroeber (1976:466) stated that the shellmounds situated around San Francisco Bay are the richest in California, "except perhaps the Santa Barbara Islands," attesting to the importance of mollusks to aboriginal sustenance in this vicinity. He further noted that it is probable that "the upper layers of nearly all" of the shellmounds (within Costanoan territory) "must accordingly be ascribed to the Costanoans" (Kroeber 1976:466).

Levy (1978a:487) estimated that in the early 1970s, the total number of persons of Costanoan descent was greater than 200 individuals. He stated that it was probable that the last known speakers of the Costanoan language had died by 1935. In 1971, descendants of the Costanoan, incorporated as the Ohlone Indian Tribe and received title to the Ohlone Indian Cemetery. The Ohlone Indian Tribe was recently officially recognized by the U.S. government.

Regional Historic Background

The Hispanic Period. As a result of the Cabrillo expedition of 1542-1543, the southbound passage of the Manila Galleon along the coast after 1565, and subsequent voyages of exploration by Cermmenho in 1597 and Vizcaino in 1602, the California coastline was familiar to navigators by the end of the sixteenth century (Donley et al. 1979). Conversely, the interior remained unknown until the eighteenth century. Initial European exploration of the Project vicinity was initiated in 1769 and lasted until 1810. During this period, a number of Spanish expeditions penetrated the territory occupied by the Costanoan peoples. Between 1769 and 1776, forays led by Portola, Ortega, Fages, Fages and Crespi, Anza (two expeditions), Rivera, and Moraga were carried out. Favorable reports led to the founding of seven missions in the region between 1770 and 1797.

In the spring of 1776, the site of San Francisco was chosen by Juan Batista Anza for the establishment of a mission and military post. Later that same year, the Mission San Francisco de Asís and Presidio de San Francisco were officially dedicated and Jose Joaquin Moraga (Anza's lieutenant) took formal possession in the name of King Carlos III (Hoover et al. 1990:331-334).

The Spanish annexation and colonization of Alta California, as manifested in the religious-military mission system, produced profound changes in the cultures of the indigenous population. The missions resettled and concentrated the aboriginal hunter-gatherer population into agricultural communities. Analysis of baptismal records, in fact, demonstrate that the last Costanoan tribelets living an aboriginal existence had disappeared by 1810. The Mission tribes were christianized and converted to a form of peasantry which was in rapid decline in Europe. As a consequence of the concentration of population, coupled with the indigenous people's lack of immunity to European diseases, the mission tribes were

decimated by common diseases that were generally not fatal to Europeans. It has been estimated that the Costanoan population declined from 10,000 or more in 1770 to less than 2,000 in 1832 (Levy 1978a:486).

Jurisdiction over Alta California was established by Mexico in April 1822. During the Mexican Period (1822-1848), control over this remote area by the central and local Mexican authorities was never strong. Rather, the Mexican Period was one of a slow disintegration of control by the Mexican government. In 1833, the mission lands were secularized, expropriated, and given out as private ranches during the next decade in the form of land grants (Donley et al. 1979).

Secularization of the missions by the Mexican authorities produced additional cataclysmic change within the indigenous cultures. The majority of the Native Americans gradually left the missions to work as manual laborers on the ranches that were established in the surrounding areas. Among some Costanoan, there was a partial return to aboriginal religious customs and some return to aboriginal subsistence practices (Levy 1978a:486-487).

The American Period. A major factor leading to the disintegration of Mexican control of California was pressure from the United States. Initial contacts were made by private citizens, such as the November 1826 visit by Jedediah Smith to the San Gabriel Mission and the 1832 stop by Ewing Young at Los Angeles. These and other sojourners brought the news of California back to the United States, helping trigger the immigration of U.S. citizens into California. The Mexican government became increasingly agitated by the continued influx of U.S. citizens into California. The semi-official 1844 and 1845 expeditions into California by John Charles Fremont further distressed the Mexican government (Beck and Haase 1974).

The continued friction between Mexico and the United States ultimately led to the Mexican War of 1846-1847. On July 9, 1846, a crew from the sloop-of-war USS *Portsmouth* came ashore and raised the first American flag over San Francisco (Beck and Haase 1974:47; Hoover et al. 1990:336). However, as Mexico had ceased stationing regular troops in San Francisco following secularization (Hoover et al. 1990:331), the raising of the flag was a symbolic gesture rather than a result of heroic exuberance.

California became part of the United States as a consequence of the U.S. victory over Mexico in the war. The territory was formally ceded in the treaty of Guadelupe Hidalgo in 1848, and was admitted as a state in 1850 (Beck and Haase 1974; Bethel 1969).

Prior to the discovery of gold at Sutter's Mill on January 24, 1848, development in the area consisted of the Spanish/Mexican facilities (i.e., the Presidio and Mission) and a small settlement known as Yerba Buena situated on the shores of the cove by the same name. The inhabitants of Yerba Buena were

predominantly non-Spanish, English-speaking immigrants (e.g., U.S. or British citizens). Sometime before the gold rush, the inhabitants of Yerba Buena officially changed the name of their settlement to San Francisco. Following the discovery of gold, San Francisco transformed rather quickly from an isolated hamlet into a bustling center of commerce (Hoover et al. 1990:334-336; Kemble 1957:7). According to historic accounts cited by Hupman and Chavez (1995:56), after the discovery of gold, the population of San Francisco grew from 375 people in 1847 to 2,000 by February 1849, and by the end of 1849, there may have been as many as 20,000 people living in the city.

Site-Specific History. The Project area is located within the area of San Francisco referred to as Potrero Point. The first documented use of the area occurred when two powder magazines were built there in 1854-1855. The Gibbon's Powder Magazine, owned and operated by Gibbons & Lammot, was located south of the intersection of Maryland and Tubbs Streets, which corresponds to a portion of the Potrero Power Plant (Wirth Associates 1979a:89). In addition to wharf facilities for loading and unloading materials, the plant contained the aforementioned magazine and a dwelling. A description of the magazine's building specifications indicate that the principal construction material was to be "hard burnt brick." The brick foundations were to measure 25 feet by 50 feet by 16 inches, laid on 3-inch redwood planking, begun "two (2) feet below the ground and carried up five (5) feet." The super-structure's walls were of brick and were 12 inches thick "carried up thirteen (13) feet from top of foundation." The floor consisted of one layer each of well-seasoned redwood and Oregon pine. The magazine was to be "'stripped' on the inside with 2- × 3-inch stuff seasoned — and lined with inch redwood seasoned, planed, jointed and blind nailed." The outside walls were to be painted with fireproof paint. The 12 inch by 3 inch rafters were to be "properly stiffened to support a heavy roof — to be covered with seasoned redwood boards (inch) and with Pinketts patent roofing" (Wirth Associates 1979a:4).

The second plant, the Hazard Powder Company (circa 1855-1876), was established along 23rd Street, between the Maryland and Louisiana Street alignments (Wirth Associates 1979a:89) and thus outside of the current project area.

The two powder magazines were destroyed or at least buried by filling and construction activities associated with the 1881 establishment of the California Sugar Refinery by Claus Spreckles (Wirth Associates 1979a).

The plant was renamed the Western Sugar Refinery when the operation became part of a sugar trust, the American Sugar Refining Company, in 1891. The plant remained in operation until 1949, when it was dismantled by a new owner, the California and Hawaiian Sugar Refining Corporation (Wirth Associates 1979a).

In addition to the sugar refinery, Claus Spreckles constructed a power generating facility on Potrero Point. Referred to as Station A, the steam-driven power plant was constructed in 1901 (Wirth Associates 1979a). Spreckle's Independent Electric Light and Power Company was ultimately purchased by San Francisco Gas & Electric, which was subsequently renamed Pacific Gas & Electric. Although refitted over the years with newer, more up-to-date power generating mechanisms, the brick structure housing the works has remained relatively unchanged for nearly a century. As of 1979 (Wirth Associates 1979a), Station A was still in operation.

Today the area of southeastern San Francisco known as the Central Waterfront is a planning area that extends from roughly Mariposa Street on the north to Islais Creek on the south, and from I-280 on the west to the San Francisco Bay on the east. The study areas for this project are located in the east central part of the Central Waterfront, along both sides of 23rd Street, east of Illinois Street (the Alternative Mirant San Francisco Converter Station and the Proposed San Francisco HWC Converter Station).

Portions of the Central Waterfront are mixed use areas with residential and commercial buildings, such as the Dogpatch neighborhood, while much of the development along 3rd Street and the waterfront itself is heavily industrial in nature. This distribution of land use began in nineteenth century and continues today. Key San Francisco industries, like ship-building, have long been represented in this part of the city, as well as a wide variety of manufacturing businesses that made rope, explosives, soap, barrels, iron, and sugar, as well as a gas manufacturing plant that evolved into what is now the Potrero Power Plant complex. Shipping and distribution facilities also predominate in this area of wharves, warehouses, truck loading docks, and railroad spurs. These trends continued and broadened after World War II, with more manufacturers, like the American Can Company, as well as more wholesale, warehousing, and distribution enterprises.

3.2 Sacramento-San Joaquin River Delta

Natural Environment

The proposed Standard Oil Converter Station and the route of the onshore AC cable are located on lands within the Sacramento-San Joaquin River Delta (Delta). The geologic history of the Delta is relatively simple. The contemporary Delta is merely the most recent of a series of deltas that have occurred within the region. During the Cretaceous, the various channels of the Mokelumne River produced the primary delta, while Quaternary geologic activity produced the present configuration (Atwater 1980; Shlemon and Begg 1975).

The geologic formations are comprised almost entirely of sedimentary units (Strand and Koenig 1965). Despite their relative youth, these deltaic sediments are very deep, a phenomenon in part due to the

constricted outlet of the system at Carquinez Strait. Sediments that would have been flushed out in a more typical delta system were instead trapped within the system. Natural levees were deposited along the courses of the numerous waterways, and the seasonal rise of the Sacramento, San Joaquin, Mokelumne, and Cosumnes Rivers often transgressed these levees and flooded the adjacent tracts. The levees trapped the receding waters, which subsequently deposited their sediments upon the tracts. The regularly flooded tracts supported dense stands of emergent plants, including tule (*Scirpus* spp.), cattail (*Typha* spp.) and rushes (*Phragmites* spp.). These dense stands of emergent plants and the seasonal accumulation of sediments produced highly organic "peaty-mucks" (Herbold and Moyle 1989).

These marshlands supported animal species important to the aboriginal economy, including tule elk (*Cervus elaphus*), waterfowl (Anseriformes spp.), and various shorebirds. Riparian vegetation occurs along some of the waterways. Native plant species of this community include Fremont cottonwood (*Populas fremontia*), willow (*Salix* spp.), California blackberry (*Rubus vitifloius*), and wild rose (*Rosa californica*). These riparian areas likely supported black-tailed deer (*Odocoileus hemionus*), River otter (*Lutra canadensis*), beaver (*Castor canadensis*) and numerous small birds and rodents. Today the riparian community contains the greatest variety of animal species within the Delta (Rollins 1977).

In addition to the marshlands and riparian areas, upland habitats are scattered about the region. These uplands are dominated today by introduced grasses and forbs; however, prehistorically they would have contained native bunchgrasses and numerous herbaceous species. Animal species frequenting the uplands would have included Pronghorn antelope (*Antilocapra americana*), black-tailed jackrabbit (*Lepus californicus*), kit fox (*Vulpes macrotis*), California Valley quail (*Lophotyx californica*), and mourning dove (*Zenaidura macroura*).

Within the rivers and slough themselves there occurred a diverse collection of fish and molluscan species, many of them highly important to the aboriginal inhabitants of the region. Among the most important were the anadromous fish species, including salmon (*Oncorhynchus* spp.), steelhead (*Salmo gairdneri*), Pacific lamprey (*Lampetra tridentata*), and sturgeon (*Acipenser* spp.).

Prehistoric Background

Beginning in the last decade of the nineteenth century, avocational archaeologists had recovered thousands of artifacts from numerous sites in the southern Sacramento Valley and adjoining Delta. A general synthesis of these early works is found within Schenk and Dawson (1929). Schenk and Dawson first described many of the sites located within the general vicinity of the Project area.

Student crews from Sacramento Junior College conducted the next series of excavations in the general region. Beginning in 1931, various sites adjacent to the Cosumnes River and Deer Creek confluence

were excavated. Joined a few years later by crews from the University of California, the Sacramento Junior College archaeologists continued their excavations within the region. These efforts culminated in the milestone works of Lillard and Purves (1936) and Lillard, Heizer, and Fenenga (1939), both of which identified a sequence of cultural change within the Sacramento Valley and adjoining Delta.

The cultural sequence identified by Lillard and his colleagues (1936; 1939) contained three cultural periods (Early, Intermediate/Transitional, Late), which were based upon changes observed within the mortuary patterns and grave furniture recovered from their sample of sites. Lillard, Heizer, and Fenenga (1939) believed that the sequence represented a single cultural progression, the Early Period evolving into the Transitional Period, the Transitional Period evolving into the Late Period.

As more archaeological work was conducted within central California during the 1940s and 1950s (primarily by the University of California Archaeological Survey), the cultural sequence developed by Lillard and his colleagues (1936; 1939) was refined and expanded to accommodate the additional data. The most significant of these revisions was Beardsley's (1954) Temporal and Areal Relationships in Central California Archaeology, in which the Central California Taxonomic System (CCTS) was formally developed.

As archaeologists in central California began trying to incorporate their data into the CCTS, the limitations of Beardsley's system became apparent. Alterations to the CCTS began appearing in the literature of the discipline, with the doctoral dissertation of Fredrickson (1973) being of the most consequence. The reader is referred to the previous prehistory discussion for a synopsis of Fredrickson’s (1973) revisions to the cultural sequence for central California.

Ethnographic Background

This component of the Project is situated within the territory ascribed to the ethnographic Bay Miwok (Bennyhoff 1977; Kroeber 1925; Levy 1978b; Schenk 1926). The Bay Miwok were one of the five Miwok groups (Coast, Lake, Bay, Plains, and Sierra) who spoke the Miwokan language. Miwokan, together with Costanoan, comprise the Utian Family of languages. Utian, in turn, is one of California's four Penutian languages, the others being Wintuan, Maiduan, and Yokutsan. Ethnographic groups speaking non-Utian Penutian languages within California include the Wintu, Nomlaki, and Patwin (Wintuan), Nisenan and Maidu (Maiduan), and the Yokuts (Yokutsan) (Shipley 1978:82-85).

Unfortunately, ethnographic data on the Bay Miwok are generally scarce. This is in part due to the early removal of these peoples from their homeland by the Spanish missions. The primary reference for the Bay Miwok is found within Kroeber's overview of California Indians (1925). A general synthesis of

Eastern Miwok (i.e., Bay and Plains together) ethnography has been written by Levy (1978b) and an early account of general Miwok life is found within Powers' study of California Indians (1877).

The Bay Miwok specifically inhabited the area surrounding Mount Diablo northward to Suisun Bay and eastward to area surrounding the confluence of the Sacramento and San Joaquin Rivers. This region is characterized by a myriad of waterways and marshes, beside which the Bay Miwok placed their villages. Bennyhoff (1977), through the utilization of explorers' accounts, mission records, historical maps, land grant claims, ethnographic sources, and archaeological data, has reconstructed the ethnogeography of the Miwok inhabiting central California. According to Bennyhoff (1977, Figure 2), the tribelet center of *Chupcan* was located within the general vicinity of the City of Antioch.

A typical settlement within Bay Miwok territory would be situated upon a natural rise along a major river or stream and could include brush shelters, sweat house(s), acorn granaries, a dance house, and earth-covered living houses (Kroeber 1925:447-449; Levy 1978b:408-409).

The principal subsistence activities of the Bay Miwok were hunting, fishing, and the gathering of wild plants. Subsistence practices relied upon a large variety of food sources, rather than being dependent on a limited number of staples. Typical of California groups, acorns from various species of oak were eaten, as were nuts, wild fruits and berries, various seeds, roots, and bulbs. Most mammal, bird, fish, and molluscan species were eaten; those that were not included the various canines, grizzly bears, black bear, skunk, eagle, amphibians, and reptiles (Levy 1978b:403; Powers 1877:351).

The Bay Miwok were organized similarly to many California Indians in that a certain territory was identified as belonging to a group and that group recognized themselves as a unit (i.e., tribelet). Several affiliated villages may have occurred within the tribelet territory. Each village, and often a group of allied villages, had a headman, whose duty was to advise the members of the community. No larger levels of political organization occurred beyond these village affiliations (Bennyhoff 1977; Gifford 1926; Kroeber 1925; Levy 1978b).

Regional Historical Background

The Hispanic Period. The Bay Miwok were greatly affected by the Spanish incursions into Northern California's interior. Following the depletion of the local coastal aboriginal groups, the missionaries turned to Northern California's interior for neophytes. Among the groups "recruited" during this second wave of proselytization were the Bay Miwok. Most of the neophytes were taken to Mission San Jose where they were baptized and induced to work. Miwok individuals appear upon Mission San Jose's baptismal records as early as 1811. Through time, many Bay Miwok individuals fled the missions, becoming fugitives within their own homeland. The missions sent out punitive military expeditions into

the Delta region. In response, several Eastern Miwok tribelets retaliated. In general, the Eastern Miwok reprisals involved raiding the missions and outlying ranchos and stealing their horses (Bennyhoff 1977; Cook 1960, 1962; Kroeber 1925; Levy 1978b).

As described previously, beginning in 1833, mission lands were secularized and expropriated (Donley et al. 1979). The former mission lands were given out as private ranches during the next decade in the form of land grants. The current Project area was once part of the 8,859-acre Rancho Los Medanos, lands provisionally granted to Jose Noriega in October 1835 (Gudde 1969; Hoover et al. 1990).

With secularization, the Native American population gradually left the missions to work as manual laborers on the ranches that were established in the surrounding areas. In many areas, multi-ethnic Native American communities appeared, often composed of remnants of Chochenyo, Eastern Miwok, Northern Valley Yokuts, Patwin, Coast Miwok, and other groups (Levy 1978b:486-487).

The American Period. The Bay Miwok were greatly impacted by the early American intrusions into the Delta region. In 1827, Jedediah Smith led a party of trappers through the Delta before embarking upon his famous journey across the Sierra Nevada (Beck and Haase 1974). Smith was quickly followed by others, including a group of trappers from the Hudson Bay Company who, in 1832, entered the Delta. Infected by malaria, these trappers spread the disease among the aboriginal communities of the region. It is reported that this pestilence often killed the inhabitants of entire villages (Cook 1955).

Those Bay Miwok who survived the epidemic, were then subjected to the mass incursion of Euro-Americans into the region following the discovery of gold at Sutter's Mill in 1848. Native peoples were no longer viewed as a source of labor as during the Mission Period, but instead as obstacles to progress. During this period the wholesale removal of the Eastern Miwok from their lands began (Bennyhoff 1977; Levy 1978b).

As the Euro-American population increased, established communities within the region (e.g., Sacramento and Stockton) grew and new communities were developed. These new, river-based communities often served as stops along the ship routes between San Francisco and the interior cities of Sacramento and Stockton. Farms were established along the waterways and the meat, dairy products, and produce were shipped to the commercial centers or to the fortune seekers combing the Sierra for gold (Owens 1991).

As the demand for agricultural land in the Delta increased, tracts of marshland were reclaimed through the construction of levees. It soon became apparent that cooperative efforts would be beneficial and thus between 1855 and 1868 local reclamation districts were legislatively established. Utilizing dried peat, a vast network of levees was constructed, primarily by Chinese labor. These efforts not only

reclaimed tracts for agricultural use but also gave some protection to the communities from the seasonal floods (Owens 1991; Thompson 1982).

With the success of the reclamation efforts, the Delta became one of California's prime agricultural regions. The great productivity of the reclaimed lands led to the establishment of canneries and packing-houses in the larger communities. Smaller communities and individual farms constructed landings to enable them to directly load their goods upon the schooners, barges, and steamships that regularly frequented the rivers and major sloughs (Owens, 1991). Within the vicinity of the Project area, John Marsh operated such a landing. The facility included a smokehouse, a wharf, a blacksmith shop, and a warehouse. The landing served as a major point of departure for produce and supplies bound for San Francisco.

The introduction of the railroad in the latter half of the 1800s, in conjunction with the sedimentation of the rivers and sloughs, led to the demise of the utilization of water transport in the Delta region. By World War I numerous railroads, including the Southern Pacific and Western Pacific, were providing efficient means of transporting goods within the Delta region. In addition, several electric lines connected the Delta towns with the larger commercial centers of Oakland and Sacramento (Owens 1991).

Today, the Delta region little resembles its appearance prior to the nineteenth century. Large tracts of agriculture now stand where extensive marshlands once existed. Small cities and towns flourish in the vicinities where Bay Miwok villages once stood. Although many of these local communities became agricultural or industrial centers, others have become tourist oriented and/or home to commuters and retirees. Local river traffic is generally confined to pleasure boaters; however, commercial shipping does continue between the Bay Area and Sacramento. The reclamation projects begun in the mid-nineteenth century are maintained to this day, ensuring the continued use of much of this region for agricultural purposes.

***Site-Specific History*.** The City of Pittsburg is located on the south bank of Suisun Bay near the mouth of New York Slough. The two study areas for historic architectural resources in Pittsburg are on W. 10th Street, on the western boundary of the city, and east of Loveridge Road, north of the Pittsburg-Antioch Highway. The study areas for this project are the Alternative Pittsburg Converter Station, 10th Street Site and the Proposed Pittsburg Converter Station, Standard Oil Site. No historic architectural resources are present on either site.

Partners Colonel J. D. Stevenson and Dr. W. C. Parker laid out a town in 1849 on the south side of Suisun Bay near Browns Island and, envisioning a grand port city, named it New York of the Pacific. The bayside location spawned the settlement's first industry, as it became a stopover for miners

traveling to Sacramento. The discovery of coal in the area in 1855 brought more shipping for a few decades but by the 1880s, local businesses were dominated by fish canneries. During the early twentieth century, wood processing and rubber manufacturing businesses were located in the area, with one of the biggest boons to the local economy being the arrival of Columbia Geneva Steel in 1906. The presence of heavy industry led the city to change its name to Pittsburg in 1911. The industrial tradition continues to this day in the city, with many chemical plants locating there as well as the Lanteri Shipyards.

In addition to being located on a navigable waterway, Pittsburg has had the fortune of being along the line of three major California railroads over the years: the Southern Pacific Rail Road, the Atchison, Topeka, and Santa Fe, and the Sacramento Northern. In 1878, the Northern Railway Company, a construction subsidiary of the Southern Pacific, completed what is today the Southern Pacific's main line from West Oakland along the east shore of San Francisco and San Pablo Bays, and the south shore of the Carquinez Strait through Martinez to what is now Pittsburg. After leaving Pittsburg, the route took a southeasterly turn through Tracy before joining up with the main San Joaquin Valley line at Lathrop Junction. Southern Pacific operated this line as a major segment of its freight service until the Union Pacific Railroad (UPRR) gained control of the line by acquiring Southern Pacific in 1996.

Construction of the San Francisco and San Joaquin Valley Railway (SF&SJV) began in 1895, and by 1898, had 278 miles of tracks from Sacramento to Bakersfield. Later that year the Atchison Topeka and Santa Fe (AT&SF) purchased the SF&SJV, bringing it into its main cross-country line through Mojave, California. With this the AT&SF broke Southern Pacific's dominance of the San Joaquin, but one vital link was missing: a line from Stockton to San Francisco. The SF&SJV had surveyed a 77-mile route between the two cities early in 1898, passing through Antioch and Pittsburg, and terminating in the East Bay at Point Richmond. AT&SF undertook the work in 1898 and completed the line to Point Richmond in 1900.

Rail service to the region continued to expand through the area in the early twentieth century. In the early 1900s, the Oakland, Antioch, and Eastern Railway (OA&E), an interurban electric railway, ran from Bay Point (Point Chicago) to Concord and Walnut Creek. Eventually the OA&E service extended all the way to Sacramento, including stops in Antioch. In 1928, the OA&E merged with the Sacramento Northern Electric Railway into a system that covered 182 miles from San Francisco Bay to the Upper Sacramento Valley, connecting Pittsburg and neighboring Antioch with points as far north as Chico. The former Sacramento Northern line runs parallel to the northern boundary of the W. 10th Street Site. Railways remained a large factor in transportation for the Pittsburg/Antioch area throughout the first half of the twentieth century, although passenger traffic greatly declined due to the rise in popularity of automobiles and construction of quality roads. The advent of World War II, however, brought a boom to rail transportation, especially freight, as well as new economic developments for Pittsburg.

World War II and resulting U.S. military buildup brought several changes to northeastern Contra Costa County and to California in general. On land just south of Antioch, the U.S. Army constructed Camp Stoneman in 1942. The camp functioned as the San Francisco Port of Embarkation's primary troop staging center and processed over one million soldiers leaving for tours in the Pacific and Korea before closing in 1954. Most troops arrived via the Santa Fe or Southern Pacific Railroads, which each had spur lines directly to the camp. At peak capacity, Camp Stoneman could accommodate 20,000 troops; the average stay was two weeks. In addition to the troops, the camp employed hundreds of local citizens and had a significant impact on the Antioch economy.

3.3 San Francisco Bay Estuary

Natural Environment

As stated previously, most of the Transbay Cable Project will be constructed beneath the surface of San Francisco, San Pablo, Suisun, and Honkers Bays, and the adjoining waterway of the Carquinez Strait. These waters are the major components of the San Francisco Bay Estuary, a system that encompasses nearly 1,600 square miles of waterways, wetlands, and bays and extends from the Golden Gate eastward to the confluence of the Sacramento and San Joaquin Rivers (i.e., the Delta). Together, the San Francisco Bay Estuary and Sacramento-San Joaquin Delta form the west coast's largest estuary, draining a watershed of more than 61,000 square miles (approximately half of California).

Historic Maritime Background

Although it is well documented that aboriginal inhabitants of the region utilized watercraft constructed of tule (Levy 1978a:406; 1978b 492), given the poor preservation qualities of this material it is not anticipated that such craft remain preserved in the submarine environment. As such, only a discussion of historic period maritime activities is provided.

The Hispanic Period. Jose de Ortega may have observed the entrance to San Francisco Bay in 1769; however, the first undisputed identification of the entrance by non-native peoples occurred on November 28, 1770 by the expedition of Pedro Fages. Entry into the Bay from the sea first occurred in August of 1775 when Juan Manuel de Ayala began his two-month-long nautical survey of the Bay aboard the San Carlos (Beck and Haase 1974:17).

The first Spanish expedition up into the river system feeding San Francisco Bay began in October 1811, when a water-borne expedition led by Father Ramon Albella set sail. The journey went by way of Angel Island, through San Pablo Bay, and past Point Pinole along the southern side of the straits. They

explored the San Joaquin River for four days before following a channel into the Sacramento River (Beck and Haase 1974:21).

On May 13, 1817, a maritime expedition led by Father Narcisco Duran and Luis Arguello departed San Francisco and set sail for Angel Island and San Pablo Bay. The crew sailed into the Sacramento River, reaching the upper reaches of the Delta after several days. They returned to San Francisco via the San Joaquin River, entering that system near Brannan Island (Beck and Haase 1974:17).

The Spanish government restricted foreign access to California, effectively isolating its citizens in California from both foreign contact and goods. Supplies were brought up the coast and into San Francisco Bay aboard Spanish supply ships originating in San Blas, Mexico (Kemble 1957:1).

It is also reported that beginning during this period, Aleut fur hunters brought to California by the Russian-American Fur Company entered the Bay aboard *bidarkas* in search of sea otters. These hunting forays continued until 1841 when the Russians withdrew from California (Kemble 1957:1; Schuyler 1978:75).

With Mexico's independence from Spain in 1821, previous trade restrictions enforced by the Spanish were relaxed. Merchant vessels from the United States and Europe began freely entering the Bay. The primary exports from the Mexican ranchos were hides and tallow, which were traded for a variety of previously unavailable goods. In addition to the merchant vessels, an occasional whaler or man-of–war would enter the Bay to restock provisions, including wood, food, and water (Kemble 1957:1).

American Period. With the discovery of gold at Sutter's Mill in 1848, ship traffic into San Francisco Bay increased dramatically. By July 1850, more vessels entered the Bay than departed. Some 500 ships lay abandoned, inside and outside the anchorage, by their crews who had deserted them in hopes of finding a better life, mostly in the gold fields.

San Francisco became a major city and port almost overnight and grew at a phenomenal rate, replacing Monterey as the coast's principal port. Maritime traffic arrived through three major shipping channels approaching San Francisco. These lanes converge outside the Golden Gate to form the single channel entering San Francisco Bay. Through this channel came lumber schooners from the Mendocino coast, along with sealers, whalers, fishermen, traders, and passenger ferries. Large docks were built in order to discharge cargo directly onto the wharves instead of being ferried by rowboats to shore. From those docks, the cargo was distributed and sometimes reloaded onto smaller vessels to transport to various settlements.

In the 1850s, commercial fishing in the San Francisco Bay began with whaling and salmon fishing. Chinese immigrants turned to shrimp fishing in the years following the gold rush. Throughout California's coastal waters, shrimp were harvested and sold. By 1855 over 50 Chinese shrimping vessels, mostly sampans and junks, operated on the San Francisco Bay. After 1870, shrimp fishing evolved into a major industry along the shores of San Pablo and San Francisco Bays. Approximately 26 fishing camps or villages have been recorded in this region. During the 1870s, a significant expansion of the fishing industry occurred due to the increased immigration of fisherman from Italy, Greece, China, and Portugal. By the beginning of the twentieth century, the staple yields of the fishing industry were salmon, crabs, cod, and oysters. (Hart 1978).

Ferry enterprises traveling to Oakland, San Pablo Bay, and San Francisco flourished during the late nineteenth century and the first half of the twentieth century. The Bay was a transportation corridor for both local and international traffic. During the early part of the American period, the ferries united the sparsely populated rural communities and ranches with San Francisco. By the early 1870s, the railroad companies owned the ferries operating on the Bay of San Francisco. As communities in the area grew larger, local trade produced a demand for more frequent ferry schedules and for inter-urban lines to feed the ferry terminals. Despite all this success, the needs of the Bay area were rapidly changing. Most ferry service ceased in 1939 with the completion of several bridges spanning the Bay and the opening of the Bay Bridge to electric trains.

4.0 INVENTORY METHODS

As a means to determine the potential effects of the proposed project to cultural resources, a number of tasks were completed, including archival research, Native American consultation, and an archaeological pedestrian reconnaissance of the terrestrial project components. Once the route of the offshore cables has moved beyond the conceptual phase, a geophysical survey of the route will be completed.

4.1 Archival Research

Archival research consisted of a literature review and record search of ethnographic and historic literature and maps, federal, state, and local inventories of historic properties, archaeological base maps and site records, and survey reports on file at the Northwest Information Center (NWIC) at Sonoma State University. The purpose of the record search was to ascertain whether any cultural resources had been previously identified within or adjacent to the Project area as well as to identify previous cultural resources investigations. In addition, archival research was also conducted in various repositories and online resources, including the Contra Costa County property records; City of Pittsburg; San Francisco Planning Department; the San Francisco Public Library; the California State Library in Sacramento; Shields Library at the University of California, Davis; and Bancroft Library at the University of

California, Berkeley. Lastly, given the extent of the project to be constructed beneath the waters of San Francisco Bay and the adjoining waters of the Sacramento-San Joaquin River Delta, the shipwreck database maintained by the California State Lands Commission was used to augment the data obtained for these unique resources. It is noted that confidential archaeological information that was reviewed for this project is contained in Appendix A and Appendix B; however, to protect archaeological resources from potential vandalism this information is not made available for review in publicly circulated versions of this EIR. Authorized federal, State and local governmental and resources agencies may review this information upon submittal of a written request to the City of Pittsburg.

Table 1 provides information regarding prior cultural resource surveys that have been conducted within, or in close proximity to, the various project components. Table 1 breaks out the onshore components in the Pittsburg area, the offshore cable route and the onshore components in San Francisco. Because the San Francisco onshore components are so tightly clustered, they have been included under a single heading with the exception of the Pier 94/96 Laydown Area, which is to the south of the other San Francisco onshore Project components. In addition to the survey information for those surveys within or immediately adjacent to the various Project components, Table 1 also lists all the other surveys that were identified during the record searches conducted at the NWIC of the California Historical Resources Information System that were within the greater search area, but did not actually intersect or occur within immediate proximity of any of the Project components.

The reader is referred to Appendix A of this report, which contains copies of the maps provided by the NWIC. These maps graphically depict the areal extent and location of the various surveys listed in Table 1. Bibliographic reference materials that are provided in Table 1 can also be found in Appendix A.

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
Pittsburg – Standard Oil and Alternate Laydown Area						
S-007647	Cultural Resource Investigation of the Proposed Pittsburg Marina Expansion Project	Woodward-Clyde Consultants	1985	Contra Costa	0	
S-010268	Cultural Resources Evaluations for the Pittsburgh-Antioch Alternatives Analysis, Contra Costa County, California	David Chavez, Sally B. Woodbridge	1988	Contra Costa	0	
S-013256	Archaeological Resources Inventory for Los Vaqueros Water Conveyance Alignments, Contra Costa County, California	A. G. Bramlette, K. M. Dowdall, M.& A. Praetzellis, D. A. Frederickson, P. Brunmeier	1991	Alameda, Contra Costa	21	see Appendix A
S-018352	East/Central Contra Costa County Wastewater Management Plan, California, Cultural Resources Survey	Colin I. Busby	1976	Contra Costa	1	CA-CCO-138
S-018440	Class II Archaeological Survey of the Contra Costa Canal, Contra Costa County, California	G. James West, Patrick Welch	1996	Contra Costa	0	
S-022464	Cultural Resource Inventory Report for the Williams Communications, Inc. Fiber Optic Cable System Installation Project, Pittsburg to Sacramento, California	Jones & Stokes Associates, Inc.	1999	Contra Costa, Solano, Yolo	4	CA-CCO-749H, CA-SOL-420H, P-48-000565, P-57-000400
S-022812	Contra Costa County Water Multipurpose Pipeline Project, Environmental Documentation Study, Cultural Resources Review (letter report)	Colin I. Busby	1997	Contra Costa	3	CA-CCO-386, 638H, and 639H

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
S-022929	Positive Archaeological Survey & Historic Resources Eval. Report for the State Route 4/Loveridge Road Flood Relief Project- Kirker Creek, City of Pittsburg, Contra Costa County	Sara Atchley	2000	Contra Costa	2	CA-CCO-732/H and CA-CCO-733
S-022930	Historic Architectural Survey Report for the State Route 4/ Loveridge Road Flood Relief Project- Kirker Creek, City of Pittsburg, Contra Costa County	Janice Calpo	2000	Contra Costa	23	see Appendix A
S-024322	Pittsburg District Energy Facility, Cultural Resources Technical Report (Appendix K)	Sally Morgan, Bruce Bachand	1998	Contra Costa	1	CA-CCO-715H
S-024323	Pittsburg District Energy Facility, Cultural Resources Technical Report (Supplement to Appendix K)	Sally Morgan, Bruce Bachand	1998	Contra Costa	1	CA-CCO-715H
Pittsburg – 10th Street						
S-007647	Cultural Resource Investigation of the Proposed Pittsburg Marina Expansion Project	Woodward-Clyde Consultants	1985	Contra Costa	0	
S-009095	Historic Resources Testing Program at the Proposed Pittsburg Marina Expansion Project	Woodward-Clyde Consultants	1985	Contra Costa	0	
S-013256	Archaeological Resources Inventory for Los Vaqueros Water Conveyance Alignments, Contra Costa County, California	A. G. Bramlette, K. M. Dowdall, M.& A. Praetzellis, D. A. Frederickson, P. Brunmeier	1991	Alameda, Contra Costa	21	see Appendix A
S-017893	Archaeological Resources Investigation for the Pittsburg Conveyance System Improvements Project (87.9191), Contra Costa County, California	David Chavez	1995	Contra Costa	0	

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
S-018440	Class II Archaeological Survey of the Contra Costa Canal, Contra Costa County, California	G. James West, Patrick Welch	1996	Contra Costa	0	
S-024323	Pittsburg District Energy Facility, Cultural Resources Technical Report (Supplement to Appendix K)	Sally Morgan, Bruce Bachand	1998	Contra Costa	1	CA-CCO-715H
Pittsburg – Mirant						
S-007647	Cultural Resource Investigation of the Proposed Pittsburg Marina Expansion Project	Woodward-Clyde Consultants	1985	Contra Costa	0	
S-009095	Historic Resources Testing Program at the Proposed Pittsburg Marina Expansion Project	Woodward-Clyde Consultants	1985	Contra Costa	0	
S-018352	East/Central Contra Costa County Wastewater Management Plan, California, Cultural Resources Survey	Colin I. Busby	1976	Contra Costa	1	CA-CCO-138
S-024986	Cultural Resources Assessment, PG&E Proposed Tri-Valley 2002 Electric Power Capacity Increase Project	Basin Research Associates, Inc.	2000	Alameda, Contra Costa	4	CA-ALA-475H, CA-CCO-500, CA-CCO-502H; C-1283
Offshore DC Cable Route						
S-002145	An Archaeological Survey of a Portion of a Proposed PG&E Transmission Line Located on the North and South Shores of Carquinez Strait near the Carquinez Bridge, Solano and Contra Costa Counties, California	Lowell F. Damon	1980	Contra Costa, Solano	0	
S-005149	Draft Environmental Impact Report, Benicia Waterfront Special Area Plan	Benjamin F. H. Ananian	1977	Solano	2	CA-SOL-238

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
S-013256	Archaeological Resources Inventory for Los Vaqueros Water Conveyance Alignments, Contra Costa County, California	A. G. Bramlette, K. M. Dowdall, M.& A. Praetzellis, D. A. Frederickson, P. Brunmeier	1991	Alameda, Contra Costa	21	see Appendix A
S-017776	Archaeological Survey Report, Carquinez Bridge Project, Contra Costa and Solano Counties, CA, Archaeological Survey 04-CC-80-12.2/SOL-80-1.1	D. M. Garaventa, S. A. Guedon, M. D. Meyer, D. J. Moore, C. F. Praetzel	1993	Contra Costa	0	
S-018901	Report on Nautical Archaeological Survey of 4 Areas in the John F. Baldwin Ship Channel	Steve Sullivan, James Allan	1996	Contra Costa	0	2 poss. shipwreck locations found
S-018902	Report on a Marine Archaeological Survey of the Proposed Southampton Shoal Ship Channel Extension Terminal and Dredge Area	Steve Sullivan, James Allan	1996	Contra Costa	1	P-07-000506; poss. shipwreck identified
S-019263	Finding of Effect Report, Benicia-Martinez Bridge System Improvement Project, Contra Costa and Solano Counties, California, CC-680 21.2/21.5, SOL-680	Caltrans	1991	Solano	1	Benicia Arsenal National Register District
S-020232	An Archaeological Resources Study for the Chevron Bay Pipeline Project near West Pittsburg, Contra Costa County, California	Jennifer Ferneau, Michael Newland	1998	Contra Costa	0	
S-022300	Historic Property Survey Report for Roadway Rehabilitation Project, Benicia-Martinez Bridge System Improvement Project in Contra Costa and Solano Counties, CC-680-21.2/21.5 SOL-680 0.0/13.1 SOL-780 0.7/7.2 04193-006010 (Caltrans)	Caltrans, District 04/John W. Snyder	1992	Contra Costa, Solano	3	CA-SOL-262, 273, & 242; village of Cordelia Historic District (11 properties)
S-024600	Historic American Engineering Record, San Francisco Oakland Bay Bridge, HAER No. CA-32 (Volumes I, II, III)	John Nelson, Dan Peterson, Stephen Mikesell, Mark Ketchum	1999	Alameda, San Francisco	1	unrecorded historic resource

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
S-024835	Maritime Archaeology Study in Support of the San Francisco Bay Rocks Removal Project	James M. Allan	2001	San Francisco	0	
S-025518	Benicia-Martinez Bridge System Improvements Project Addendum, Archaeological Survey Report – Maritime Archaeology, Contra Costa and Solano Counties (Caltrans)	James Allan, Aaron Golbus, William Self	2002	Contra Costa, Solano	2	CA-CCO-746H and 745H
S-025617	Carquinez Bridge Project Addendum Archaeology Survey Report Maritime Archaeology (Caltrans)	James Allan	2001	Contra Costa, Solano	1	P-number not assigned
S-026690	Cultural Resources Assessment Report SFPP, L.P. Proposed Concord to Sacramento Pipeline Project Addendum Three- Proposed Reroute Nos. 1, 11, 11A, and 12	Leigh Martin, William Self	2003	Solano	0	
San Francisco – HWC Converter Station, W. Pacific Laydown Area, Mirant Potrero Converter Station, and Sheedy Converter Station						
S-009328	Cultural Resources Evaluation of the Pier 70 Container Freight Station, San Francisco, California	Archeo-Tec	1986	San Francisco	0	
S-011396	Technical Report of Cultural Resource Studies for the Proposed WTG-WEST, Inc. Los Angeles to San Francisco and Sacramento, California, Fiber Optic Cable Project	BioSystems Analysis, Inc.	1989	Monterey, San Benito, San Mateo, Santa Clara	49	see Appendix A
S-014074	Potrero 7: Phase II, Archaeological Test Excavations	Wirth Associates, Inc.	1979	San Francisco	6	unrecorded historic features
S-016882	Archaeological Resources Investigations for the Waterfront Plan EIR, San Francisco, California: Southern Waterfront	Jan M. Hupman, David Chavez	1995	San Francisco	0	unrecorded historic resources

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
S-019127	Cultural Resources Investigation for the Bayside Phase III Discharge Alternatives EIR, San Francisco, California	David Chavez & Associates	1993	San Francisco	3	CA-SFR-101H, 102H, and 103H
S-022657	Archaeological Survey Along Onshore Portions of the Global West Fiber Optic Cable Project	I. Sawyer, L. Pfeiffer, K. Rasmussen, J. Berryman	2000	San Francisco, Santa Cruz, San Mateo, Santa Clara, Monterey, San Benito	14	see Appendix A
S-023232	Cultural/Historical Resources, SF-019-02, 900 Minnesota Street, San Francisco, California, VERTEX Project No. 2024	George McKale	2000	San Francisco	0	
S-024032	Nextel Communications Evaluation of Nextel Site Number CA-2349A "Central Basin", in San Francisco, CA (letter report)	Lorna Billat	2001	San Francisco	1	P-38004313
S-025044	Archaeological Resources Review and Management Plan for the Muni Metro Third Street Light Rail Project (King Street to Sunnydale Avenue), San Francisco, California	Jan M. Hupman, David Chavez	2001	San Francisco	0	possible historic resources
S-025045	Archaeological Resources Investigations for the Bayview-Hunters Point Redevelopment Plan, San Francisco, California	Jan M. Hupman, David Chavez	2001	San Francisco	8	see Appendix A; possible historic resources
S-025999	Central Waterfront Cultural Resources Survey, Summary Report, and Draft Context Statement	SF Planning Dept + Architec. Heritage, Ctrl Waterfront Survey Advisory Comm., Dogpatch Neighborhood Association, Page & Turnbull, Architects	2001	San Francisco	142	
S-027737	Nextel Communications Wireless Telecommunications Service Facility – San Francisco County, Nextel Site No. CA-02771/ Potrero Hill (letter report)	Lorna Billat	2000	San Francisco	0	

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
S-028766	Archaeological Resources Investigations for the Bayview-Hunters Point Redevelopment Plan, San Francisco, California, Oakinba and South Basin Addition Activity Notes	Jan M. Hupman, David Chavez	2004	San Francisco	2	CA-SFR-10; CA-SFR-15
San Francisco – Alternative Construction Laydown Area						
S-016882	Archaeological Resources Investigations for the Waterfront Plan EIR, San Francisco, California: Southern Waterfront	Jan M. Hupman, David Chavez	1995	San Francisco	0	unrecorded historic resources
S-025045	Archaeological Resources Investigations for the Bayview-Hunters Point Redevelopment Plan, San Francisco, California	Jan M. Hupman, David Chavez	2001	San Francisco	8	see Appendix A; possible historic resources
S-028766	Archaeological Resources Investigations for the Bayview- Hunters Point Redevelopment Plan, San Francisco, California, Oakinba and South Basin Addition Activity Notes	Jan M. Hupman, David Chavez	2004	San Francisco	2	CA-SFR-10; CA-SFR-15
Cultural Resource Surveys Within the Search Area but Outside Specific Project Components						
S-000019	An Evaluation of Recent Archaeological Discoveries at Angel Island State Park	Ronald F. King, John A. Raushkolb	1973	Marin	4	CA-MRN-42-45
S-001935	An Archaeological Reconnaissance of the Point San Pablo Project Area, Richmond, Contra Costa County, California	Peter M. Banks	1980	Contra Costa	2	CA-CCO-280 & CA-CCO-420
S-002180	San Francisco to Stockton, California: Intensive Cultural Resources Survey and Literature Review of Four Additional Proposed Dredged Material Disposal Sites in Contra Costa and Solano Counties – Final Report	U.S. Army Corps of Engineers	1980	Contra Costa, Solano	0	

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
S-002191	Cultural Resources Survey on Mare Island Naval Reserve, Solano County, California (Appropriation #W522 0 Z9005 2523 A52004) (letter report)	Katherine Flynn	1980	Solano	2	CA-SOL-17 & CA-SOL-233
S-002885	An Archaeological Reconnaissance of the Proposed Crockett Bluff Development Area in Northern Contra Costa County (letter report)	Miley Paul Holman	1982	Contra Costa	0	
S-003206	Union Ferry Depot Building (National Register of Historic Places – Nomination Form)	Pamela McGuire	1977	San Francisco	1	CA-SFR-55H
S-003212	Ferry Station Post Office Building, Agriculture Building (National Register of Historic Places – Nomination Form)	Pamela McGuire	1978	San Francisco	1	CA-SFR-61H
S-003214	Archaeological Resources of Golden Gate National Recreation Area	Roger E. Kelly	1976	Marin, San Francisco	37	see Appendix A
S-003243	Historical and Archaeological Reconnaissance of Rincon Point and South Beach Project	Eleanor Mason Ramsey	2000	San Francisco	0	
S-005091	Archaeological Assessment of Area 5 (Glen Cove), City of Vallejo, Solano County, California	David Chavez	1977	Solano	2	CA-SOL-235 & CA-SOL-236
S-005147	VOIDED: COPY OF S-002191					
S-005940	Archaeological Resources Evaluation for the I-280 Transfer Concept Program EIS/EIR, San Francisco	David Chavez, Laurence Shoup	1983	San Francisco	0	
S-006020	Archaeological Investigations in Conjunction with Construction at Angel Island State Park, 1982 (California Department of Parks and Recreation)	Phillip W. Hines, Lee Motz, Dwight D. Simons, Christina Swiden	1983	Marin	0	CA-MRN-42-45

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
S-006559	Archaeological Element of the Environmental Assessment of the United States Navy Homeporting Study, Mare Island, California	Wiliam Roop	1984	Solano	0	
S-006560	Archaeological Element of the Draft Environmental Impact Statement of the United States Navy Homeporting Study, Treasure Island, California	Wiliam Roop	1984	San Francisco	0	
S-006780	Archaeological Investigation of the Paradise Cove Wastewater Collection System Study Area, Tiburon Peninsula, Marin County, California	Christian Gerike, Suzanne B. Stewart	1984	Marin	3	CA-MRN-48, 49, and 50
S-007245	Cultural Resource Investigation for the Port of Stockton Deep Water Channel Fill Disposal Project, Morrow and Simmons Islands, Solano County, California	L. Kyle Napton	1985	Solano	0	
S-007386	Cultural Resources Evaluation for the Delta Landing EIR/EIS, Antioch, Contra Costa County, California	David Chavez	1985	Contra Costa	0	
S-007670	Cultural Resource Investigation for the Port of Stockton Deep Water Channel Fill Disposal Project, McAvoy Harbor Fill Site, Contra Costa County, California	L. Kyle Napton	1985	Contra Costa	0	
S-009214	An Archaeological Reconnaissance of the Baker Property (170 Acres), between Pittsburg and Antioch, Contra Costa County, California	Richard D. Ambro	1987	Contra Costa	0	
S-011502	Archaeological Reconnaissance of the McAvoy Yacht Harbor, Pittsburg, California, Land Use Permit #2109-89	Suzanne Baker	1990	Contra Costa	0	

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
S-012396	Overview and Archaeological Reconnaissance of C&H's Proposed Co-generation Plant and Attendant Facilities	Amy Gilreath	1991	Contra Costa	0	
S-012943	Archaeological Observations at Angel Island State Park	Adan E. Treganza	1966	Marin	6	CA-MRN-42-45
S-013104	Resource Inventory, Angel Island State Park, General Description	unknown	1977	Marin	9	CA-MRN-42-45; unrec'd historic resources
S-013405	San Francisco Municipal Railway, Metro Turnaround Project, Historical and Cultural Resource to 1887	E.M. Rose and Associates	1988	San Francisco	0	unrecorded historic features
S-013471	An Archaeological Investigation of a Proposed Sandy Beach Sewerage Replacement in Vallejo, Solano County, California	Sunshine Psota	1991	Solano	1	CA-SOL-360H
S-013831	Archaeological Archival Research and Field Inspection of the City of Pittsburg Waterfront Truck Route Assessment District Project, Pittsburg, Contra Costa County, California	Miley Paul Holman	1991	Contra Costa	0	
S-015500	Cultural Resources Overview, Naval Weapons Station, Concord, Contra Costa County, California	W. Self, G. Mattson, C. Wills, N. Dyer, A. Samuelson	1993	Contra Costa	2	CA-CCO-638H & CA-CCO-639H; many historic resources
S-015602	Correspondence Concerning Proposed Homeporting of a Battleship Battlegroup and a Cruiser Destroyer Group in the San Francisco Bay Area (letter report)	Kathryn Gualtieri, Lou Wall	1987	San Francisco	3	CA-SFR-12-14; former Chinese fishing camp & historic structures

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
S-016152	Architectural Data Recovery, J. L. Heald Agricultural Works ("Banker's Warehouse"), C&H Sugar Refinery, Crockett, Contra Costa County, California	William Self, Melanie Odell, Carrie Wills	1994	Contra Costa	0	
S-017289	Cultural Resources Investigations for the Easton Point Development Project, Tiburon, California	Jan M. Hupman, David Chavez	1995	Marin	0	
S-017329	Restoration of Angel Island Natural Areas: A Cultural Resource Evaluation (California Department of Parks and Recreation)	Thomas Wheeler	1995	Marin	28	CA-MRN-42
S-017827	An Archaeological Survey Report for the Ferry Building, San Francisco, California	Holman & Associates	1995	San Francisco	1	CA-SFR-55H
S-018353	A General Plan for the Management of Cultural Resources within the North Shore Outfalls, North Point Pump Station, and Channel Outfalls Project, San Francisco	James E. Ayers, Lyle M. Stone	1976	San Francisco	0	
S-019317	Archaeological Inventory and Assessment of Naval Station Treasure Island Disposal and Reuse Project, San Francisco County, California	Blossom Hamusek-McGann, Cindy Baker, Mary Maniery	1997	San Francisco	1	CA-SFR-4; see Appendix A: 21 isolated historic features
S-020465	Pittsburg District Energy Facility, Cultural Resources Technical Report (Appendix K)	Brian Hatoff, Lori Harrington, Sean Dexter	1998	Contra Costa	1	CA-CCO-715H
S-020904	Review of Historic Resources for Site SF-021-01, Pier 23 at the Embarcadero, San Francisco, San Francisco County, California (50001 89/98) (letter report)	Sunshine Psota	1998	San Francisco	0	

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
S-023070	Cultural Resources Evaluation/ Archaeological Reconnaissance Report, Selby Industrial Site, Wickland Oil Company, Contra Costa County, California (Contra Costa County LP 98-2088) (letter report)	Colin I. Busby	1999	Contra Costa	0	
S-023217	Archaeological Testing and Monitoring Program, Mid- Embarcadero Surface Roadway and F-Line Extension Project, Final Report	James M. Allan	2000	San Francisco	1	CA-SFR-127H
S-023667	Archaeological Testing and Monitoring Program, Mid- Embarcadero Surface Roadway and F-Line Extension Project, Final Report	James M. Allan	2000	San Francisco	0	
S-024289	Los Medanos Energy Facility, LLC, Preliminary and Final Cultural Resources Report (Condition of Certification CUL-13)	URS Corporation	2001	Contra Costa	2	CA-CCO-715H; P-07-000864
S-024548	Nextel Communications Evaluation of Nextel Site Number CA-20256G Financial District in San Francisco, California (letter report)	Lorna Billat	2001	San Francisco	1	one unrecorded historic resource
S-024592	Archaeological Monitoring for WS01 Long Haul Fiber Optic Segment, between Sacramento and Emeryville, California	Denise Furlong, Kim Tremaine	2001	Alameda, Contra Costa, Napa, Santa Clara, Solano	15	see Appendix A
S-024604	Revised Predictive Archaeological Model for Mare Island, Vallejo, Solano County, California	Mary Maniery	2000	Solano	37	see Appendix A; 28 historic features
S-024756	Nextel Communications Evaluation of Nextel Site Number: CA-0256G Financial District in San Francisco, California (letter report)	Lorna Billat	2002	San Francico	1	P-number not assigned

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
S-025095	Cultural Resources Study of the California State University, California Maritime Academy Campus, Vallejo, Solano County, CA	N. Kaptain, S. Palmer, G. McKale	2002	Solano	1	CA-SOL-234
S-025198	Site Visit to the Fort McDowell/Angel Island Remediation Project in San Francisco and Marin Counties, California (letter report)	William Self	2002	Marin, San Francisco	0	
S-026060	Archaeological Monitoring of Environmental Site Investigations at Fort McDowell, Angel Island, Marin County, California	William Self	2002	Marin	0	unrecorded cultural resources
S-026374	Report of Archival and Historic Literature Research on Three Obstructions to Navigation on the Sacramento-San Joaquin River Delta, Contra Costa County, California	James M. Allan	2002	Contra Costa	0	
S-027443	Angel Island State Park Management Plan, General Development Plan, and Environmental Impact Report	Richard Humphrey et al.	1979	Marin	0	
S-028252	Archaeological Survey and Assessment of Line Section 72 Anomaly Dig 1 (letter report)	William Self	2004	Contra Costa	0	
S-028894	Research Notes on Angel Island from December 1885	Alphonse Pinart	1985	Marin	4	P-21-000074 and P-21-000075
S-029378	Results of an Archaeological Monitoring Program for the Excavation of a Joint Trench and Bridge Piers on the lands of Traeger, CA-MRN-48/H, 3700 Paradise Drive, Marin County, California	Sally Evans	2004	Marin	0	

Table 1
Transbay Cable Project Record Search Results

S Number	Title	Author(s)	Year	County(s)	# of Sites	Associated Resources/ Notes
S-030387	Historical Resources Compliance Report, Burlington Northern Santa Fe Railway Double Track Project (Segment 2), Oakley (MP 1146.1) to Port Chicago (MP 1164.4), In and Near the Cities of Oakley, Antioch, and Pittsburg, and the Port Chicago Naval Weapons Station, Contra Costa County, California	Bai Tang, Michael Hogan, Josh Smallwood, Terri Jacquemain	2005	Alameda	1	CA-CCO-732/H

Source: Northwest Information Center records searches performed 9/2/05, 10/25/05, and 11/4/05.

Archival research revealed that an archaeological investigation of the Potrero Power Plant (Mirant Potrero property) was conducted by Wirth Associates for an earlier expansion of the facility (1979a, 1979b). Within a trench excavated outside of the current project footprint, remnants of one of the mid-nineteenth century powder magazines discussed previously were exposed. No site number was ever assigned to these materials.

As mentioned above, the online SLC Shipwreck Database (http://shipwrecks.slc.ca.gov/ ShipwrecksDatabase/Shipwrecks_Database.asp) was also reviewed. The SLC database is comprised of list of shipwrecks by county and is based primarily on historical accounts of these incidents. It should be noted that most of the location data thus refer to where the ship went down as opposed to where it came to rest. As such, a ship may have gone down well beyond the Project corridor but ultimately came to rest within or immediately adjacent to the proposed cable route. Given the uncertainty of where a potential shipwreck may be located, the cultural resources study corridor for the offshore segment was expanded an additional 250 meters on both sides of centerline (1,000 m total width). At the crossing of the BART Transbay tube, the Project study area was expanded westward to allow for design flexibility in this geologically sensitive area. As such, the 1,000-meter-wide shipwreck study area was correspondingly widened in this particular location (see Figure 1, Sheet 1).

In addition to the records of the NWIC and the SLC, shipwreck locations taken directly from the U.S. Geological Survey topographic maps were used. These unnamed and undated wrecks are mapped along many of the region's waterways. It is unknown whether or not any of these mapped wrecks correspond to those listed in the SLC database. Figure 3, Sheets 1 and 2 depict the geographic relationship between the proposed AC and DC cable routes and the various reported shipwrecks. Table 1 below lists the potential and known shipwrecks within the Project study area and indicates the geographic relationship between each and the proposed AC and DC cable routes.

Table 2
Shipwreck Data

Ship's Name (Year of Wreck)	Latitude	Longitude	Descriptive location from the Cable Route	DC Cable Milepost	Data Source
Alice Garrett (1888)[1]	37° 47' 50"	122° 23' 30"	860 meters WSW of DC cable	3.5	SLC
Amelia (1889)	38° 02' 54"	122° 10' 50"	52 meters SW of DC cable	33.39	SLC
Armenia (1899)	38° 02' 54"	122° 10' 50"	52 meters SW of DC cable	33.39	SLC
Baldwin Channel Wreck (1864)[2]	37° 59' 54"	122° 25' 13"	41 meters SE of DC cable	18.77	NWIC
Baldwin Channel Wreck (1864)[2]	37° 59' 48"	122° 25' 04"	320 meters SE of DC cable	18.8	NWIC
Goddess (1865)	37° 49' 01"	122° 24' 01"	484 meters WSW of DC cable	4.94	SLC
Harry (1904)	38° 03' 20"	122° 15' 20"	435 meters SSE of DC cable	29.03	SLC
Helen Hensley (1854)*	37° 47' 56"	122° 23' 30"	777 meters WSW of DC cable	3.63	SLC
Honauwar (1889)	38° 02' 54"	122° 10' 50"	52 meters SW of DC cable	33.39	SLC
Monarch (1915)	38° 03' 30"	122° 14' 36"	322 meters S of DC cable	29.77	SLC
Ringleader (1869)	38° 01' 30"	122° 21' 54"	365 meters SE of DC cable	22.52	SLC
San Carlos (1797)[1]	37° 48' 10"	122° 23' 40"	752 meters WSW of DC cable	3.94	SLC
West Wind (1876)[1]	37° 47' 40"	122° 23' 30"	995 meters WSW of DC cable	3.35	SLC
Wreck #1(no date)	38° 01' 43"	122° 09' 58"	348 meters SW of DC cable	34.94	USGS
Wreck #2 (no date)[3]	38° 02' 31"	121° 53' 44"	148 meters S of DC cable	52.05	USGS
Wreck #2 (no date)[3]	38° 02' 31"	121° 53' 44"	17 meters SE of AC Cable	0.527	USGS

Notes:

[1] Wrecks beyond 500 m of centerline but within vicinity of expanded study area at BART crossing
[2] Two sets of coordinates were provided by the NWIC for this archaeologically identified wreck believed to be the Sagamore.
[3] This particular wreck falls within the study areas of both the DC and AC cable routes.

P-598 – The *Sagamore*

The record search also revealed that only a single archaeological site had been previously identified in the Project study area. The files of the NWIC included one archaeologically identified shipwreck within the Project corridor. Listed in Table 1 as the "Baldwin Channel Wreck," these remains were discovered during a geophysical survey of the Pinole Shoal Channel (Sullivan and Allan 1996). The identified remains consist of seven acoustic targets that have been interpreted to be various-sized portions of the cargo and ballast of the schooner *Sagamore*. The *Sagamore* was lost off Point Pinole, San Pablo Bay during a storm in 1864. The schooner was transporting a load of granite for Grant & Co., a San Francisco stone cutting firm. One of the crew drowned during the gale, the remaining crew clinging to

the rigging until being rescued by the *Julia* out of Stockton. The site record for this site is provided in Appendix B.

It is worth noting that this wreck, if indeed the remains of the *Sagamore*, is situated over 7.5 miles downstream from its reported wreck location as listed in the SLC shipwreck database. This is thus a clear example of the discrepancy between where a wreck reportedly went down (as listed on the SLC database) and where the vessel rests today.

4.2 Native American Consultation

To assist in securing information regarding potential important resources to the local Native American community, a request for a review of the Sacred Lands File was submitted to the Native American Heritage Commission (NAHC). A review of the Sacred Lands File by the staff of the NAHC failed to identify specific information concerning lands on which the proposed Project is to be constructed.

In addition to the review of the Sacred Lands File, the NAHC provided a list of contacts from the local Native American community. All groups and individuals identified by the NAHC were notified about the Project and questioned about their concerns and/or knowledge of resources in the area. A single response was received from the Native American community concerning the applicability of Senate Bill 18 to the proposed Project. As the Project under consideration neither proposes new specific or general plans nor requires changes to existing specific and/or general plans, Senate Bill 18 does not apply. No responses have been received from the Native American community concerning cultural resources within the project area or project alternatives (Appendix C). It is noted that, unlike appendices A and B, Appendix C is not regarded as confidential information and is included in publicly circulated versions of this EIR.

4.3 Archaeological Pedestrian Reconnaissance

The archaeological pedestrian reconnaissance included the visual inspection of exposed ground surfaces of the various terrestrial Project components and alternatives in both San Francisco and Pittsburg. The study areas were confined to those areas where ground-disturbing (e.g., trenching, grading) activities are proposed. In nearly all instances, the lands on which the proposed Project is to be constructed are either highly disturbed by past industrial development or covered by asphalt and/or concrete.

In areas where vegetation obscured the ground surface, 20-cm by 20-cm patches were occasionally cleared using hand tools or footwear to increase ground visibility. In addition, rodent burrows, cut-banks, unpaved roadways, and graded areas were intensively examined for evidence of past human activity. The developed portions of the Project area were only given cursory attention given that the

ground surface was obscured in these locations. More detailed discussions of each of the geographic project components are provided below.

San Francisco Components

The San Francisco terrestrial components of the Project are comprised of the HWC Converter Site, the Alternative Mirant Potrero Converter Site, the Alternative Sheedy Converter Site, the Western Pacific Staging Area, and the Alternative Pier 94/96 Laydown Area.

On October 11, 2005 Mark Hale conducted a visual inspection of the HWC Converter Station site. The HWC property is completely developed with the ground surface obscured by expanses of asphalt and structures. No archaeological resources were identified during the field visit.

Access to the Alternative Mirant San Francisco Converter Station had not been secured and thus was not subject to a pedestrian survey at this time. Although the Mirant property was not physically examined during the current investigation, the parcel has been previously subjected to archaeological pedestrian surveys in the past with negative results (Dames & Moore 2000; ESA 1998). Like the other San Francisco components of the current investigation, the Mirant parcel is completely developed. It should be mentioned herein, that Wirth Associates (1979a, 1979b) previously conducted an archaeological investigation of the site for an expansion of the Potrero facility. Remnants of a mid-nineteenth century powder magazine associated with the first documented historic-era use of the Potrero Point area were located within a trench excavated outside of the current construction footprint (Wirth Associates 1979a, 1979b). No formal record for these remains was ever transmitted to the NWIC, and thus a state trinomial has never been assigned to them, nor do they appear in the results of the record search.

On April 5, 2005 Brian Hatoff conducted a pedestrian reconnaissance of the Western Pacific Staging Area. The Western Pacific parcel is completely developed with the ground surface obscured by expanses of asphalt, gravel, and structures. No archaeological resources were identified during the field visit.

Also on April 5, 2005 Brian Hatoff visually inspected the Alternative San Francisco Converter Station/Sheedy from the property perimeter as access to the Sheedy was not secured at the time. The Sheedy parcel is completely developed, the ground surface within the parcel obscured by both asphalt and structures. No archaeological resources were identified during the field visit.

On November 10, 2005 Mark Hale conducted a visual inspection of the Alternative Pier 94/96 Laydown Area. Pier 94/96 is completely developed with the ground surface obscured by expanses of asphalt and structures. No archaeological resources were identified during the field visit.

Pittsburg Components

The Pittsburg terrestrial components of the project are comprised of the Standard Oil Converter Station, Alternative Pittsburg 10th Street Site, Alternative Mirant Pittsburg Converter Site, two Alternative Standard Oil Access roads, and two laydown areas.

On April 4, 2005, Brian Hatoff made field visits to the majority of the Pittsburg Project components. Specifically on that day, he conducted a pedestrian reconnaissance at the Alternative Pittsburg Converter Station, Mirant and the general route of the AC line from that facility to the shoreline. The area is heavily industrialized and largely paved. The survey was negative for archaeological resources.

He also conducted a pedestrian reconnaissance of the Proposed Pittsburg Converter Station at the Standard Oil site as well as the cable corridor from the AT&SF railroad north to the shoreline at New York Slough. The Standard Oil site is highly disturbed by past development while the cable corridor follows an existing dirt roadway with excellent surface visibility. This survey was negative for archaeological resources.

Also on April 4, 2005, Brian Hatoff visited the Alternative Pittsburg Converter Station at 10th Street. The pedestrian reconnaissance was limited to the southern portion of the "T" where it abuts 10th Street. The subject parcel is completely paved or contains industrial use buildings affording no ground visibility. As such, this survey was negative for archaeological resources.

On September 19, Brian Hatoff and Mark Hale conducted a pedestrian survey of the proposed cable route from the Standard Oil site northward to the AT&SF railroad and then eastward along the AT&SF corridor. They also surveyed access proposed access road between the Standard Oil site and Loveridge Road. These surveys were negative for archaeological resources.

On September 22, 2005 Mark Hale made a field visit to the Dow Chemical property, surveying additional lands on both sides of the proposed cable corridor from the AT&SF railroad north to the shoreline at New York Slough. The area bordering the western side of the proposed roadway is highly disturbed by Dow Chemical development while the eastern side is comprised of open grasslands. This survey was negative for archaeological resources.

On October 19, 2005 Brian Hatoff conducted a pedestrian survey of the proposed access road for the proposed Pittsburg Converter Station at the Standard Oil site that would run from the Pittsburg-Antioch Highway north to the proposed facility. The access road route is along an existing dirt road that has been recently tilled along portions of its margins. An existing concrete pipeline has been constructed within the road alignment. At the Pittsburg-Antioch Highway there is a deep artificially cut channel just

north of the highway. The edges of the channel and freshly tilled areas were subject to close inspection for cultural deposits or materials. No cultural materials or deposits were observed. A westbound turn-in lane is also proposed for the access road along the Pittsburg-Antioch Highway. The shoulder of the road was also subject to a pedestrian survey for approximately 300 feet from the turn-in point east. This survey was negative for archaeological resources.

5.0 RECOMMENDATIONS

San Francisco Components

No archaeological resources were identified within the footprint of the proposed San Francisco Project or alternative configurations during the current investigation. The lack of archaeological resources is not surprising given the highly developed nature of the area in which the San Francisco components are to be constructed. Of the various components, however, only the Mirant Potereo property warrants additional measures to ensure the proper management of archaeological resources.

As discussed previously, remains associated with the Gibbon's Powder Magazine have been identified within the Mirant Potrero property. Due to the elevated archaeological sensitivity of this specific location, it is recommended that a series of mechanical borings be placed within the construction footprint of any Project activities to be undertaken on the Mirant Potrero property. These borings should extend down to the depth of construction. The mechanical borings should be approximately 6 inches in diameter. Recovered spoils should be screened through ¼-inch hardware mesh and examined for cultural materials. Should archaeological materials be found, a detailed research design should be completed and used to guide a thorough testing and evaluation program. The need for data recovery, monitoring, or other appropriate mitigation measures will be determined following completion of the evaluation program.

The other San Francisco components, the HWC Converter Station site, the Alternative Sheedy Converter Station site, the Western Pacific Staging Area, and the Alternative Pier 94/96 Laydown Area, should not require further consideration. Project activities proposed for the Western Pacific property and Pier 94/96 consist only of the staging and/or stock piling of equipment and materials. As no ground-disturbing procedures are proposed with these plans, no impacts to archaeological resources will occur.

Construction of the converter station on either the HWC or the Sheedy property will not result in impacts to significant archaeological resources as both parcels are highly disturbed by industrial development and are situated on land reclaimed in the 1940s (Dow 1973:149; USGS 1942).

Pittsburg Components

No archaeological resources were identified within the footprint of the Standard Oil Converter Station, Alternative Pittsburg 10th Street Site, Alternative Mirant Pittsburg Converter site, two Alternative Standard Oil Access roads, or two laydown areas. Surface visibility was good to excellent for the proposed access road to connect the Standard Oil site with the Pittsburg-Antioch Highway and the proposed cable route from the Standard Oil site to the shore of New York Slough. In contrast, surface visibility for the remainder of the Pittsburg components was poor to non-existent given the presence of past industrial and/or commercial development. As no archaeological resources were identified where visibility was good and because it is unlikely that intact archaeological remains occur within the highly disturbed areas, no further measures targeting the protection of archaeological resources are recommended for the Pittsburg components.

It always remains possible, however, that previously unidentified archaeological materials could be inadvertently exposed during ground-disturbing activities. As such, in the event of the discovery of buried archaeological artifacts, exotic rock (non-native), or unusual amounts of shell or bone, it is recommended that Project activities in the vicinity of the find be immediately stopped and a qualified professional archaeologist consulted to assess the resource and provide proper management recommendations.

San Francisco Bay Components

Submerged and sub-bottom archaeological resources are known within the San Francisco Bay and Sacramento-San Joaquin River Delta submarine environments. Although unlikely, prehistoric resources, such as submerged shellmounds, or settlement sites, could exist in these settings. Known historic resources in these environs include maritime vessels and materials related to these or other historical activities. During implementation of the proposed Project, in particular the installation of the AC and DC cables through boring and dredging, submerged and/or sub-bottom archaeological resources could be encountered. Unless properly evaluated and managed, this could result in a potentially significant impact to cultural resources.

To ensure the proper treatment of these unique cultural resources, it is recommended that a geophysical remote sensing survey be conducted to detect any potential submerged or sub-bottom archaeological resources within the study corridor. Depending on the geographic or bathymetric setting, appropriate remote sensing field survey could include deployment of a side scan sonar, sub-bottom profiler, and magnetometer to help detect these resources. The results of the geophysical survey should be reviewed by a qualified marine archaeologist and a report documenting these efforts and interpreting the results will be produced.

Potential submerged and/or sub-bottom archaeological resources detected through the geophysical survey should be avoided unless they can satisfactorily be determined to not represent archaeological resources (e.g., modern debris, existing infrastructure) as documented in the technical report. If it is infeasible to avoid potential submerged and/or sub-bottom archaeological resources, follow-up diver survey or Remote Operated Vehicle investigations might be required to positively identify the targets. If targets are determined to be submerged and/or sub-bottom archaeological resources, they should be evaluated against the NRHP/CRHR significance criteria. If the resources are not eligible for the NRHP/CRHR, then no further consideration of these resources is required. If the resources are eligible for the NRHP/CRHR, Data Recovery may be required.

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Appendix A

Confidential Archaeological Information

It is noted that confidential archaeological information that was reviewed for this project is contained in Appendix A; however, to protect archaeological resources from potential vandalism this information is not made available for review in publicly circulated versions of this EIR. Authorized federal, State and local governmental and resources agencies may review this information upon submittal of a written request to the City of Pittsburg.

Appendix B

Site Record for P-598 – The Sagamore Shipwreck

It is noted that confidential archaeological information that was reviewed for this project is contained in Appendix B; however, to protect archaeological resources from potential vandalism this information is not made available for review in publicly circulated versions of this EIR. Authorized federal, State and local governmental and resources agencies may review this information upon submittal of a written request to the City of Pittsburg.

Appendix C

Native American Consultation

Notification Letters to Members of the Local Native American Community from the List Provided by the Native American Heritage Commission (NAHC)

Facsimile Transmittal

Transmitted By:

Name: Christopher M. Lee **Date:** 9/29/05
Company: URS Corp/Oakland, CA
Fax #: 510/874-3268
Phone #: 510/893-3600

Number of Pages (including cover): ~~2~~ 1

Please Deliver To:

Name: Ms. Debbie Pilas-Treadway
Company: Native American Heritage Commission (NAHC)
Fax #: 916/657-5390 **Office Phone #:**
Subject: **Data Request for Trans Bay Cable project in multiple Bay Area Counties**

Comments:

Dear Ms. Pilas-Treadway:

I am writing to you on behalf of a client who proposes to install an underground/underwater water cable from Pittsburg, Contra Costa County beneath the San Pablo and San Francisco Bays to the City of San Francisco. The majority of the work will be performed in the water, but limited action areas will exist on land. The project is located on the following USGS 7.5' quads and Townships, Ranges, and Sections:
County(ies): Sacramento & Contra Costa. Quad: Antioch North; Township (T) 2 North (N), Range (R) 1 East (E), Section (S): unsectioned area of City of Pittsburg near Pittsburg Point and the New York Slough
County(ies): San Francisco. Quad: San Francisco North; T1S, R5W, unsectioned area of Bay ½ mile west of San Francisco shore and small unsectioned area on land in City of San Francisco at Potrero Point.

I am requesting the following information:

- Groups or individuals the NAHC believes should be notified regarding this project.
- Identification by the NAHC of any sacred lands within the subject lands that are listed within the Sacred Lands File.

Thank you for your attention to this request.

Sincerely,

Christopher M. Lee
Archaeologist
URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612
Phone: 510/893-3600
Fax: 510/874-3268

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390
Web Site www.nahc.ca.gov

October 5, 2005

Christopher Lee
URS Corporation

Sent by Fax: 510-874-3268
Number of Pages: 7

RE: **Proposed Trans Bay Cable project, Contra Costa County**

Dear Mr. Lee:

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4038.

Sincerely,

Debbie Pilas-Treadway
Environmental Specialist III

Native American Contacts
Contra Costa County
October 4, 2005

Jakki Kehl
720 North 2nd Street
Patterson , CA 95363
jakki@bigvalley.net
(209) 892-2436
(209) 892-2435 - Fax
Ohlone/Costanoan

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28
Hollister , CA 95024
Ohlone/Costanoan

Katherine Erolinda Perez
1234 Luna Lane
Stockton , CA 95206
canutes@comcast.net
(209) 462-2680
Ohlone/Costanoan
Northern Valley Yokuts
Bay Miwok

The Ohlone Indian Tribe
Andrew Galvan
PO Box 3152
Mission San Jose , CA 94539
chochenyo@AOL.com
(510) 656-0787 - Voice
(510) 882-0527 - Cell
(510) 687-9393 - Fax
Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

Ella Rodriguez
PO Box 1411
Salinas , CA 93902
(831) 632-0490 - home
(831) 261-5827 - cell
Ohlone/Costanoan
Esselen

Trina Marine Ruano Family
Ramona Garibay, Representative
5816 Thornton Ave
Newark , CA 94560
510-300-5971 - cell
Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

Amah/Mutsun Tribal Band
Michelle Zimmer, Cultural Resource Coordinator
PO Box 62-558
Woodside , CA 94062
(408) 866-1594
Ohlone/Costanoan

Amah/MutsunTribal Band
Irene Zwierlein, Chairperson
789 Canada Road
Woodside , CA 94062
amah_mutsun@yahoo.com
(650) 851-7747 - Home
(650) 851-7489 - Fax
Ohlone/Costanoan

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resource assessment for the proposed Trans Bay Cable project, Contra Costa County.

Native American Contacts
Solano County
October 4, 2005

Cortina Band of Indians
Elaine Patterson, Chairperson
PO Box 1630 Wintun / Patwin
Williams , CA 95987
corranch@inreach.com
(530) 473-3274 - Voice
(530) 473-3190 - Voice
(530) 473-3301 - Fax

Cortina Band of Indians
Bill Combs, Vice Chairperson
PO Box 1630 Wintun / Patwin
Williams , CA 95987
(530) 473-3274 - Voice
(530) 473-3190 - Voice
(530) 473-3301 - Fax

Rumsey Indian Rancheria of Wintun
Kesner Flores, Cultural Resources Specialist
5433-K, Clayton Road, #133 Wintun / Patwin
Clayton , CA 94517
calnagpra@hotmail.com
925-586-8919

Rumsey Indian Rancheria of Wintun
Bill Ritter, Tribal Administrator
P.O. Box 18 Wintun (Patwin)
Brooks , CA 95606
britter@rumseywinton-nsn.gov
(530) 796-3400
(530) 796-2143 Fax

Rumsey Indian Rancheria of Wintun
Mike Reiff, Director of Facilities
P.O. Box 18 Wintun (Patwin)
Brooks , CA 95606
mreiff@rumseywinton-nsn.gov
(530) 796-3400
(530) 796-2143 Fax

Wintun Environmental Protection Agency
P.O. Box 1839 Wintun (Patwin)
Williams , CA 95987
corwepa@hotmail.com
(530) 473-3318
(530) 473-3319
(530) 473-3320 - Fax

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This list is only applicable for contacting local Native Americans with regard to cultural resource assessment for the proposed Trans Bay Cable project, Solano County.

Native American Contacts
Marin County
October 4, 2005

Grant Smith
4309 Chico Ave
Santa Rosa , CA 95401
(707) 528 -2584
Coast Miwok
Pomo

The Federated Indians of Graton Rancheria
Frank Ross
813 Lamont Ave
Novato , CA 94945
miwokone@yahoo.com
(415) 269-6075
Coast Miwok
Southern Pomo

Kathleen Smith
1778 Sunnyvale Avenue
Walnut Creek , CA 94596
(925) 938-6323
Pomo
Coast Miwok

Ya-Ka-Ama
6215 Eastside Road
Forestville , CA 95436
yakaama.indian.ed@att.net
(707) 887-1541
Pomo
Miwok
Wappo

The Federated Indians of Graton Rancheria
Gene Buvelot
PO Box 14428
Santa Rosa , CA 95402
coastmiwok@aol.com
(415) 883-9215 Home
Coast Miwok
Southern Pomo

The Federated Indians of Graton Rancheria
Greg Sarris, Chairperson
PO Box 14428
Santa Rosa , CA 95402
coastmiwok@aol.com
(707) 566-2288
(707) 566-2291 - fax
Coast Miwok
Southern Pomo

The Federated Indians of Graton Rancheria
Tim Campbell, Cultural Resources Officer
PO Box 14428
Santa Rosa , CA 95402
coastmiwok@aol.com
(707) 566-2288
(707) 566-2291 - fax
Coast Miwok
Southern Pomo

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URS

October 17, 2005

Ms. Jakki Kehl
720 North 2nd Street
Patterson, CA 95363

Dear: Ms. Kehl

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

The proposed project involves the construction of a power converter station in the town of Pittsburg approximately 2000 feet from Suisun Bay near Brown's Island. There are two alternatives to this proposed site, the areas of which are depicted on the map provided. From this power converter station the electrical lines will be placed in Suisun Bay and will travel west through the Carquinez Strait and into San Pablo Bay where the electrical cables will then turn south toward San Francisco. The cable lines will pass approximately 2000 feet east of Angel Island as it travels south. The cable line will then pass approximately one mile west of Yerba Buena Island and will make landfall again in San Francisco where a proposed power converter station would be built in the Potrero Point area of San Francisco. Again, there are two alternate locations for this converter station, the areas of which are depicted on the map provided.

URS Corporation contacted the California Native American Heritage Commission (NAHC) for a review of its Sacred Lands Files concerning the entire project area on land and through the Bay. The results of the NAHC review was negative. However, the NAHC also provided a list of groups or individuals that may have specific knowledge of cultural resources, or have other concerns in the specific project area. Your name was on this list provided by the NAHC. Should you have any knowledge of cultural resources in the specific project area or know of other contacts who may have such specific knowledge, or if you have other concerns in the specific project area, please telephone Brian W. Hatoff at (510) 874-3195 or write to 1333 Broadway, Suite 800, Oakland, CA 94612. If we do not hear from you within two weeks of receipt of this letter we will assume you have no comments.

Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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(Please Print Clearly) Jakki Kehl

Patterson, CA 95363

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PS Form 152, May 2002

URS

October 17, 2005

Ms. Michelle Zimmer
Cultural Resources Coordinator
Amah/Mutsun Tribal Band
P.O. Box 62-558
Woodside, CA 94062

Dear: Ms. Zimmer

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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Michelle Zimmer
(Please Print Clearly)

Woods. de, CA 94062

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PS Form 152, May 2002 (See Reverse)

URS

October 17, 2005

Ms. Katherine Perez
1234 Luna Lane
Stockton, CA 95206

Dear: Ms. Perez

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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Katherine Perez
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Stockton, CA 95206

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PS Form 152, May 2002

URS

October 17, 2005

Ms. Ella Rodriguez
P.O. Box 1411
Salinas, CA 93902

Dear: Ms. Rodriguez

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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PS Form 152, May 2002

URS

October 17, 2005

Ms. Irene Zwierlein
Chairperson
Amah/Mutsun Tribal Council
789 Canada Road
Woodside, CA 94062

Dear: Ms. Zwierlein

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
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Irene Zwierlein
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Woodside, CA 94062

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PS Form 152, May 2002

URS

October 17, 2005

Ms. Ann Marie Sayers
Chairperson
Indian Canyon Mutsun Band of Coasanoan
P.O. Box 28
Hollister, CA 95024

Dear: Ms. Sayers

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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Hollister, CA 95024

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PS Form 152, May 2002 (See Reverse)

URS

October 17, 2005

Mr. Andrew Galvan
The Ohlone Indian Tribe
P.O. Box 3152
Mission San Jose, CA 94539

Dear: Mr. Galvan

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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Andrew Galvan
(Please Print Clearly)

Mission San Jose, CA 94539

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PS Form 152, May 2002

URS

October 17, 2005

Ms. Ramona Garibay
Representative
Trina Marine Ruano Family
5816 Thornton Avenue
Newark, CA 94560

Dear: Ms. Garibay

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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Ramona Garibay
(Please Print Clearly)

Newark, CA 94560

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PS Form 152, May 2002

URS

October 17, 2005

Ms. Elaine Patterson
Chairperson
Cortina Band of Indians
P.O. Box 1630
Williams, CA 95987

Dear: Ms. Patterson

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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PS Form 152, May 2002 (See Reverse)

URS

October 17, 2005

Mr. Bill Combs
Vice Chairperson
Cortina Band of Indians
P.O. Box 1630
Williams, CA 95987

Dear: Mr. Combs

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
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Fax: 510.874.3268

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PS Form 152, May 2002

(See Reverse)

URS

October 17, 2005

Mr. Kesner Flores
Cultural Resources Specialist
Rumsey Indian Rancheria of Wintun
5433-K Clayton Road, #133
Clayton, CA 94517

Dear: Mr. Flores

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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PS Form 152, May 2002

URS

October 17, 2005

Mr. Bill Ritter
Tribal Administrator
Rumsey Indian Rancheria of Wintun
P.O. Box 18
Brooks, CA 95606

Dear: Mr. Ritter

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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PS Form 152, May 2002

(See Reverse)

URS

October 17, 2005

Mr. Mike Reiff
Director of Facilities
Rumsey Indian Rancheria of Wintun
P.O. Box 18
Brooks, CA 95606

Dear: Mr. Reiff

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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Mike Reiff
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Brooks, CA 95606

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PS Form 152, May 2002

URS

October 17, 2005

Wintun Environmental Protection Agency
P.O. Box 1839
Williams, CA 95987

Dear: Environmental Protection Agency

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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PS Form 152, May 2002

URS

October 17, 2005

Mr. Grant Smith
4309 Chico Avenue
Santa Rosa, CA 95401

Dear: Mr. Smith

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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PS Form 152, May 2002

URS

October 17, 2005

Ms. Kathleen Smith
1778 Sunnyvale Avenue
Walnut Creek, CA 94596

Dear: Ms. Smith

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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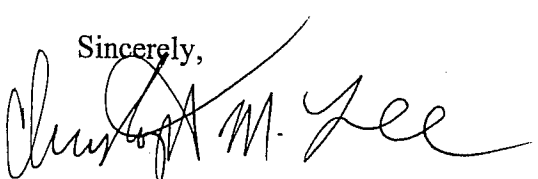
Sincerely,



Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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Walnut Creek, CA 94596

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PS Form 152, May 2002

URS

October 17, 2005

Mr. Gene Buvelot
The Federated Indians of Graton Rancheria
P.O. Box 14428
Santa Rosa, CA 95402

Dear: Mr. Buvelot

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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URS

October 17, 2005

Mr. Greg Sarris
Chairperson
The Federated Indians of Graton Rancheria
P.O. Box 14428
Santa Rosa, CA 95402

Dear: Mr. Sarris

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

The proposed project involves the construction of a power converter station in the town of Pittsburg approximately 2000 feet from Suisun Bay near Brown's Island. There are two alternatives to this proposed site, the areas of which are depicted on the map provided. From this power converter station the electrical lines will be placed in Suisun Bay and will travel west through the Carquinez Strait and into San Pablo Bay where the electrical cables will then turn south toward San Francisco. The cable lines will pass approximately 2000 feet east of Angel Island as it travels south. The cable line will then pass approximately one mile west of Yerba Buena Island and will make landfall again in San Francisco where a proposed power converter station would be built in the Potrero Point area of San Francisco. Again, there are two alternate locations for this converter station, the areas of which are depicted on the map provided.

URS Corporation contacted the California Native American Heritage Commission (NAHC) for a review of its Sacred Lands Files concerning the entire project area on land and through the Bay. The results of the NAHC review was negative. However, the NAHC also provided a list of groups or individuals that may have specific knowledge of cultural resources, or have other concerns in the specific project area. Your name was on this list provided by the NAHC. Should you have any knowledge of cultural resources in the specific project area or know of other contacts who may have such specific knowledge, or if you have other concerns in the specific project area, please telephone Brian W. Hatoff at (510) 874-3195 or write to 1333 Broadway, Suite 800, Oakland, CA 94612. If we do not hear from you within two weeks of receipt of this letter we will assume you have no comments.

Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612-1924
Tel: 510.893.3600
Fax: 510.874.3268

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PS Form 152, May 2002

URS

October 17, 2005

Mr. Tim Campbell
Cultural Resources Officer
The Federated Indians of Graton Rancheria
P.O. Box 14428
Santa Rosa, CA 95402

Dear: Mr. Campbell

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
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PS Form 152, May 2002

URS

October 17, 2005

Mr. Frank Ross
The Federated Indians of Graton Rancheria
813 Lamont Avenue
Novato, CA 94945

Dear: Mr. Ross

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
1333 Broadway, Suite 800
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PS Form 152, May 2002

URS

October 17, 2005

Ya-Ka-Ama
6215 Eastside Road
Forestville, CA 95436

Dear: Ya-Ka-Ama

The purpose of this letter is to apprise you of a proposed electrical transmission line project under San Francisco Bay. The project will include two distinct areas of surface land construction in Pittsburg (Contra Costa County) and San Francisco. The majority of this project and cable line will be in the Suisun, San Pablo, and San Francisco Bays. A map of the proposed project area has been included for your reference.

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Sincerely,

Christopher M. Lee
Staff Archaeologist
URS Corp
Oakland, CA

URS Corporation
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PS Form 152, May 2002

Historical Resources Inventory and Evaluation Report

Pittsburg/San Francisco Transbay Cable Project

Prepared for:

URS Corporation

Prepared by:

JRP Historical Consulting
1490 Drew Avenue, Suite 110
Davis, California 95616

March 2006

SUMMARY OF FINDINGS

The proposed Trans Bay Cable Project (the "Project") by the Trans Bay Cable LLC is a High Voltage Direct Current ("HVDC") transmission line project that is planned to transmit electrical power and provide a dedicated connection between the East Bay in Pittsburg, California, and the electrical transmission and distribution facilities in San Francisco, California. The proposed Project includes installation of approximately 57 miles of HVDC submarine cable in the bottom of San Francisco Bay and the Carquinez Straits from a converter station to be constructed in the City of Pittsburg in Contra Costa County, to a converter station to be constructed in the City and County of San Francisco near Potrero Point.

The permitting for this project requires Trans Bay Cable LLC to comply with California Environmental Quality Act (CEQA) and to assess the impact this project may have on historical resources. JRP Historical Consulting is subcontracted to URS Corporation to assist in the preparation of compliance documents regarding historical resources for this project. JRP inventoried and evaluated the sites for the proposed converter stations in both Pittsburg and San Francisco to assess whether they include any properties that could be considered historical resources under CEQA, i.e. whether the properties are listed in, determined eligible for, or appear eligible for listing in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR), or are eligible for local agency historic resource inventories. The NRHP and CRHR evaluation criteria are consistent with the historic preservation ordinances of both the City of Pittsburg and the City of San Francisco. This study was conducted in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines using the criteria outlined in Section 5024.1 of the California Public Resources Code. Changes to a historical resource could be considered a significant impact on the environment under CEQA.

The general location of the study area for this project and the immediate vicinity of each of the sites that required survey of potential historical resources are depicted in the figures provided in **Appendix A** of this document. This inventory included two study areas in Pittsburg (the Proposed Pittsburg Converter Station, Standard Oil Site and the Alternative Pittsburg Converter Station, W. 10th Street Site), and two study areas in San Francisco (the Proposed SF Converter Station, HWC Site and the Alternative SF Converter Station, Mirant Site). The other sites proposed for construction did not contain historic architectural resources that were more than fifty years old and did not require further evaluation (see Section 2).

No potential historical resources were identified by the inventory and evaluation of the Pittsburg study areas. Both sites in Pittsburg (the Proposed Pittsburg Converter Station, Standard Oil Site and the Alternative Pittsburg Converter Station, W. 10th Street Site) contained buildings and structures more than 50 years old, however, none of these resources is historically or architecturally significant, or a historical resource for the purposes of CEQA. JRP recorded nine properties in the Pittsburg study areas and evaluated them on DPR 523 forms, which are attached as **Appendix B** of this document, because they had not been previously evaluated.

The two San Francisco sites studied (the Proposed SF Converter Station, HWC Site and the Alternative SF Converter Station, Mirant Site) contain historical resources that had been previously identified by other surveys. The historical resources at these two sites had been

recently inventoried and evaluated and did not require re-evaluation for this project. The resources and their historic status are described in Section 4 and copies of the evaluation forms from the previous studies appear in **Appendix B**.

The proposed project or alternative options of the project could cause significant adverse impacts to the two historical resource properties in San Francisco. The project proponent will work with local agencies and interested parties to identify appropriate and adequate mitigation for potential significance impacts. Mitigation measures that could be considered for this project include: relocation, recordation, contribution to local preservation efforts in the Central Waterfront area, interpretive displays, and salvage opportunities.

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1. PROJECT DESCRIPTION

The proposed Trans Bay Cable Project (the Project) by the Trans Bay Cable LLC is a High Voltage Direct Current ("HVDC") transmission line project that is planned to transmit electrical power and provide a dedicated connection between the East Bay in Pittsburg, and the electrical transmission and distribution facilities in San Francisco (please see Appendix A for project location maps). The proposed Project includes installation of approximately 59 miles of HVDC submarine cable in the bottom of San Francisco Bay and Carquinez Straits from a converter station to be constructed in the City of Pittsburg in Contra Costa County to a converter station to be constructed in the City and County of San Francisco near Potrero Point. The permitting for this project requires Trans Bay Cable LLC to comply with the California Environmental Quality Act (CEQA) and to assess the impact this project may have on historical resources.

2. RESEARCH AND FIELD METHODS

The study areas for historic architectural resources for this project consist of sites for proposed and alternative converter stations in the cities of Pittsburg and San Francisco. The steps taken to identify possible historical resources and potential impacts the project may have on historical resources follow CEQA Guidelines Section 15064.5.

In Pittsburg, two sites were evaluated: the Proposed Pittsburg Converter Station, Standard Oil Site, located at 1301 Standard Oil Avenue (Assessor's Parcel Number [APN] 073230007) in eastern Pittsburg; and the Alternative Pittsburg Converter Station, W. 10th Street Site, which consists of eight legal parcels in the 500-600 block of West 10th Street in western Pittsburg. In San Francisco, this inventory included two study areas located in the southeastern portion of the city, within the Central Waterfront area: the Proposed SF Converter Station, HWC Site, located at 435 23rd Street, Block 4232, Lot 010; and the Alternative SF Converter Station, Mirant Site (located at 1201 Illinois Street).

No further historic architectural investigation was required for other proposed or alternative construction sites because these areas did not contain potentially historic resources. The other sites proposed for construction did not contain historic architectural resources that were more than fifty years old and did not require further evaluation. These sites are:

Pittsburg	San Francisco
Alternative Pittsburg Converter Station, Mirant	Alternative SF Converter Station, Sheedy
Alternative Construction Laydown Area, Mirant	Proposed Construction Laydown Area, Western Pacific
Alternate Construction Laydown Area (west of Standard Oil Site)	Alternative Construction Laydown Area, Pier 94/96

The URS Corporation requested records searches from the Northwest Center of the California Historical Resources Information Center at Sonoma State University for this project between

July and October, 2005. These record searches found that two of the study areas in San Francisco (the Proposed SF Converter Station, HWC Site and the Alternative SF Converter Station, Mirant Site) contain historical resources that had been previously inventoried and evaluated. The previous inventory and evaluation of these historical resources was recent and complete and did not require re-evaluation for this project. The summary descriptions and historic status of these properties are found in Section 4 and the previous evaluation forms appear in **Appendix B**. The results of the Information Center searches included other historic resource recordation forms in the general vicinity, but none of these is located in or near the San Francisco study areas for this project.

The Information Center record searches revealed other previously identified resources near, but not within the Pittsburg study areas (see Appendix B). These include three railroads: the former Southern Pacific Railroad (now Union Pacific), the former Atchison, Topeka & Santa Fe Railroad (now BNSF), and the former Pittsburg Railroad alignment. The railroad context and general historic status is discussed in Section 3. An industrial complex adjacent to, but outside of the Proposed Pittsburg Converter Station, Standard Oil site was also previously evaluated. None of these resources have been found historically significant, and none appear eligible for the NRHP or CRHR.

JRP also reviewed other previous studies and local historical resource inventories conducted within these study areas. JRP reviewed the National Register Information System database for properties listed in the NRHP, the Office of Historic Preservation Historic Property Data File, California Historic Resources Information System, California Historical Landmarks, and California Points of Historical Interest, to identify whether resources in the study area had been previously evaluated.[1] The review of NRHP listed or eligible properties was necessary because these properties would automatically be eligible for listing the CRHR and would be considered historical resources for the purposes of CEQA.

JRP conducted fieldwork and research in Pittsburg and San Francisco between September and November 2005, recording nine properties (at the two Pittsburg sites) for description on DPR 523 forms. JRP prepared a historic context to address the themes and background for both the survey of buildings in Pittsburg and the known historical resources in San Francisco. JRP evaluated the Pittsburg properties in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and also under NRHP and CRHR criteria, on the DPR 523 forms. JRP also conducted research in various repositories and online resources, including: Contra Costa County property records; City of Pittsburg; San Francisco Planning Department; the San Francisco Public Library; the California State Library in Sacramento; Shields Library at the University of California, Davis; Bancroft Library at the University of California, Berkeley. The previous inventory and

[1] National Park Service, National Register Information System, online database: http://www.nr.nps.gov/ and http://www.nationalregisterofhistoricplaces.com/CA/state.html (accessed November 2005); Office of Historic Preservation, "Directory of Properties in the Historic Property Data File for Contra Costa County," August 2005; Department of Parks and Recreation, *California Inventory of Historic Resources* (March 1976); Office of Historic Preservation, *California Historical Landmarks* (Sacramento: California State Parks, 1996); and Office of Historic Preservation, *California Points of Historical Interest* (Sacramento: California State Parks, May 1992).

evaluation forms for the historical resources in San Francisco appeared to be complete and well documented and required no additional historical research.

This research showed that two of the study areas in San Francisco contained historic resources (the Proposed SF Converter Station, HWC Site, and the Alternative SF Converter Station, Mirant Site), which contain the sugar warehouses and former Station A buildings, respectively. The Proposed Pittsburg Converter Station, Standard Oil is near a potentially eligible resource: the former alignment of the Pittsburg Railroad, however the railroad is not located within the study area parcel. The context for these historical resources is presented in Section 3. The relevant themes and context within which to discuss the historical significance of the Pittsburg resources include the industrial and railroad transportation development of the City of Pittsburg, and the construction and operation of Camp Stoneman. The railroad alignment is not a historical resource for the purposes of CEQA and required no further study. These themes are discussed in Section 3. JRP also summarized the history of San Francisco's industrial development along the Central Waterfront area, in order to provide historical context for those properties within the study area that have been previously evaluated (located at the Proposed SF Converter Station, HWC Site and the Alternative SF Converter Station, Mirant Site).

The description and historical evaluations of the survey population properties are summarized in Sections 4 and 5. Refer to the references listed in Section 7 for a complete listing of materials consulted, and to Section 6 for JRP staff professional qualifications. The DPR 523 forms are included in Appendix B.

3. HISTORIC OVERVIEW

The following section provides historical background and information regarding the history of Pittsburg and San Francisco relevant to industry in general and to the specific project areas. This information provides appropriate historical context within which to evaluate the historical significance of the properties under review.

3.1. History of Pittsburg and its Industrial Growth

The City of Pittsburg is located near the confluence of the Sacramento and San Joaquin rivers, on land that once comprised part of the 8,890-acre Rancho Los Medanos. Brothers Jose and Antonio Mesa received the rancho as a land grant in 1839 and held the property until 1849 when Colonel J.D. Stevenson and Dr. W.C. Parker purchased the tract. That year, Stevenson and Parker laid out a town, naming it "New York of the Pacific" in the hopes that it would become one of the great port cities of the west coast. The bayside location sparked the settlement's first major commercial activity as it became a stopover for miners traveling to Sacramento and beyond to the Sierra gold fields. Although the stream of hopeful Gold Rush miners soon died out, the discovery of coal in the vicinity of the riverside town in 1855 breathed new life into the region. By 1860 several coal mines operated in the area, with numerous short railroad lines extending from the mines near Mount Diablo to town's river wharves, where the coal was

shipped to distant markets. In recognition of the role that coal then played in the community's development, the town changed its name to Black Diamond.[2]

While coal had spawned the region's first industry, by the 1880s fishing drove the local economy. Four canneries operated in Black Diamond at that time, supplied by Italian fisherman who worked the waters of the Delta. The town's industrial base continued to expand, and during the early twentieth century wood-processing and rubber manufacturing companies established facilities in Black Diamond.[3] The biggest boon to the local economy, however, came when Columbia Geneva Steel opened in 1906. This first appearance of heavy industry in the area led the city to change its name to Pittsburg in 1911.[4] The industrial tradition continued in the city throughout the twentieth century. Several chemical plants in particular located there, as well as the Lanteri Shipyards.[5]

3.2. Development of Transportation

In addition to being on a navigable waterway, Pittsburg has had the fortune of being located along the lines of three major California railroads over the years: the Southern Pacific (SPRR, now the Union Pacific), the Atchison, Topeka, and Santa Fe (AT&SF, now the Burlington Northern & Santa Fe), and the Sacramento Northern.[6] Both the Proposed Pittsburg Converter Station, Standard Oil Site and the Alternative Pittsburg Converter Station, W. 10th Street Site treated in this report lie adjacent to, or near these lines.

Rail transportation played a role in the community's development as early as the 1860s, when short rail lines extended from the coal mines near Mount Diablo to the city's wharves. Between 1866 and 1878 at least three coal mining operations on Mount Diablo laid short lines (less than seven miles each) from the rugged mine sites, northward to various landings on the south shore of Suisun Bay. These trains brought the ore to landings where it was taken by ship to San Francisco for local and industrial use. The Pittsburg Railroad, also known as the Pittsburg & Black Diamond Railroad, ran from the mining camp of Somersville to New York Landing, east of Pittsburg Point. Mine production fell in the later nineteenth century and the railroad closed in the early 1900s and tracks were removed at some point between 1916 and 1931. The former alignment for the Pittsburg Railroad is near the Proposed Pittsburg Converter Station, Standard Oil Site being studied for this project; it parallels the western boundary of the site (see Figure A). The former rail alignment does not retain original materials, design, workmanship, setting, association, or feeling and did not require further study for this project.[7]

---

[2] Mae Fisher Purcell, *History of Contra Costa County* (Berkeley: The Gillick Press, 1940), 189, 190, 353, 698; George Emanuels, *California's Contra Costa County: An Illustrated History* (Fresno, California: Panorama West Books, n.d.), 225, 226, 227; California Division of Mines, "Geologic Guidebook of the San Francisco Bay Counties," *Bulletin 154* ([San Francisco, Division of Mines: 1951), 223-225, 349-357.

[3] Purcell, *History of Contra Costa County*, 189, 190; Emanuels, *California's Contra Costa County: An Illustrated History*, 225, 226, 227.

[4] City of Pittsburg website, accessed September 16, 2005 at http://www.ci.pittsburg.ca.us/pittsburg/.

[5] Emanuels, *California's Contra Costa County: An Illustrated History*, 228.

[6] USGS, *Honker Bay, Calif., 7.5' Topographic Map* (Washington, D.C.:USGS, 1953).

[7] USGS, *Mt. Diablo Quadrangle,* Scale 1:62,500, Surveyed in 1896, reprinted 1905 (Washington, D.C.: USGS); USGS, *Antioch Quadrangle* (Washington, D.C.: USGS, 1908); USGS, *Antioch North,* 7.5 minute series

The city did not receive a major rail line connecting with the rest of the state until 1878. In that year, the Northern Railway Company, a construction subsidiary of the Southern Pacific, completed what is today the SPRR's main line from West Oakland, along the east shore of San Francisco and San Pablo bays, and the south shore of the Carquinez Strait, through Martinez to what is now Pittsburg. After leaving Pittsburg, the route took a southeasterly turn through Tracy before joining up with the main San Joaquin Valley line at Lathrop Junction. Southern Pacific operated this line, which borders the Proposed Pittsburg Converter Station, Standard Oil Site to the south, as a major segment of its freight service until the Union Pacific Railroad (UPRR) gained control of the line by acquiring SPRR in 1996.[8] The former SPRR line runs east-west, just south of the Proposed Pittsburg Converter Station, Standard Oil Site study area for this project where it intersects the former Pittsburg Railroad alignment. This former junction was called "Los Medanos," as shown on the 1908 map in Figure A, however the Pittsburg line was removed at some point before 1931 and does not retain historic integrity. The SPRR line has been previously recorded on DPR 523 forms (see P-07-002568, Appendix B), but it has been extensively refurbished and upgraded since its construction, and does not retain historic integrity; it required no further study for this project.

Pittsburg's second major rail line originated in the efforts of a group of San Francisco businessmen, led by sugar tycoon Claus Spreckles, to break the Southern Pacific's monopoly of rail transportation in the San Joaquin Valley. Construction began on this second line, known as the San Francisco and San Joaquin Valley Railway (SF&SJV), in 1895. By 1898, the SF&SJV had 278 miles of track running from Sacramento to Bakersfield. Later that year the Atchison, Topeka, and Santa Fe purchased the SF&SJV, connecting the new line to the AT&SF main cross-country line in Mojave, California. Only one vital link was missing in this effort to break the Southern Pacific's dominance: a line from Stockton to San Francisco. The SF&SJV had previously surveyed a 77-mile route between these two cities early in 1898, passing through Antioch and Pittsburg, and terminating in the East Bay at Point Richmond where the company planned to link with ferry service to the harbor in San Francisco. SF&SJV chief engineer William Benson Storey and James Dun, the chief engineer for the AT&SF, undertook the work in 1898, completing the line to Point Richmond in 1900.[9] The former AT&SF line runs past both Pittsburg study areas: north of the Proposed Pittsburg Converter Station, Standard Oil Site, east of Pittsburg, and south of the Alternative Pittsburg Converter Station, W. 10th Street Site in western Pittsburg. The line has been previously recorded on DPR 523 forms (see P-07-000806, Appendix B), but it has been extensively refurbished and upgraded since its construction, and does not retain historic integrity. It required no further study for this project.

Topographic, aerial photos 1931 and 1941 (Washington, D.C.: USGS, 1953); California Division of Mines, "Geologic Guidebook of the San Francisco Bay Counties," *Bulletin 154* ([San Francisco, Division of Mines: 1951), 223-225, 349-357.

[8] Erle Heath, *Seventy-Five Years of Progress: Historical Sketch of the Southern Pacific* (San Francisco, CA: Southern Pacific Bureau of News, 1945), 10-11, passim.

[9] Keith L. Bryant, *History of the Atchison, Topeka and Santa Fe Railway* (New York: Macmillan, 1974), 173-181; L.L. Waters, *Steel Trails to Santa Fe* (Lawrence: University of Kansas Press, 1950), 133-140; Richard B. Rice, William Bullough, and Richard Orsi, *The Elusive Eden: A New History of California* (New York: Alfred A. Knopf, 1988), 217-236; J. L. Brown, *The Mussel Slough Tragedy,* ([n.p.], 1958), 123-125.

Rail service to the region continued to expand in the early twentieth century. The Oakland, Antioch, and Eastern Railway (OA&E), an interurban electric railway, ran from Bay Point (Point Chicago) to Concord and Walnut Creek by the early 1900s. The OA&E and its franchised railways, eventually provided interurban electric railway lines between Bay Point and Sacramento, including stops in Antioch. In 1928, the OA&E merged with the Sacramento Northern Electric Railway into a system that covered 182 miles from San Francisco Bay to the Upper Sacramento Valley, connecting Pittsburg and neighboring Antioch with points as far north as Chico.[10] The Sacramento Northern line runs roughly parallel to W. 10th Street, west of Pittsburg, along the north side of the Alternative Pittsburg Converter Station, W. 10th Street Site study area for this project. The former Sacramento Northern line has been extensively altered since its construction and it does not retain historic integrity. It required no further study for this project.

Railways remained a large factor in transportation for the Pittsburg/Antioch area throughout the first half of the twentieth century, although passenger traffic greatly declined due to the rise in popularity of automobiles and construction of quality roads. The advent of World War II, however, brought a boom to rail transportation, especially freight, as well as new economic developments for Pittsburg.

In addition to railroads, a system of roads developed in northeastern Contra Costa County. From a very early date in the history of the county, Willow Pass Road was an important and heavily traveled road. In the 1930s, the state built Legislative Route Number 75 (LRN75) which took much of its alignment from Willow Pass Road and other early county roads. During the 1930s and 1940s, this local highway provided access to Port Chicago, Pittsburg, and Antioch; portions of LRN 75 are now referred to as the Pittsburg-Antioch Highway after the route's alignment was altered and its designation changed to SR 4 in the 1950s and 1960s. Portions of the old Pittsburg-Antioch Highway exist today between Pittsburg and Antioch, however much of the thoroughfare has been re-routed to accommodate new development. West 10th Street, at least a portion of it, existed at the time of the 1908 USGS map in Figure A, however, it was only about half a mile long at that point. Modern West 10th Street has been extended and roughly parallels Willow Pass Road as that old route enters the city on the west. West 10th Street parallels the southern border of the Alternative Pittsburg Converter Station, W. 10th Street Site study area.[11]

The development of improved roads marked the decline of passenger traffic on railways and the ascendancy of the automobile. The commercial development of the area along West 10th Street clearly reflects this transition in transportation. Established by 1931, Erickson's Courts auto camp was among the first businesses on this block, outside of the study area, on the south side of the street. The auto camp was followed by drive-in restaurants, motels, auto repair shops and trucking enterprises. Other occupants of the area included building contractors, a dairy and a

[10] Heath, *Seventy-Five Years of Progress*, 10-11, passim.

[11] USGS, *Karquines Quadrangle*, Scale 1:62,500, Surveyed 1893, edition of 1897; USGS, *Antioch Quadrangle*, Scale 1:62,500, Surveyed 1906, edition of 1908; USGS, "Honker Bay, Calif.," Scale 1:24,000, 1953; "State Route 4," online information, private website at www.calhighways.org; Contra Costa Title Company, *Industrial and Agricultural Road Map of Contra Costa County* (Martinez, CA: Contra Costa County Title Co., 1930); *Official Map of Contra Costa County, California*, 1930; Contra Costa County Board of Supervisors, *Official Map of Contra Costa County, California*, 1954.

roller-skating rink. Construction of the majority of the buildings on this block of West 10th Street occurred prior to 1968.[12] Today auto related businesses still dominate the block.

3.3. The Impact of World War II

World War II proved as financially rewarding to Pittsburg as it did to California in general. The military buildup for the war brought several changes to Contra Costa County, including an increase in industrial activity throughout the region. Local shipbuilding companies started to supply ships to the navy, and as elsewhere in California and the United States other industries began to contribute to the war effort. Additionally, a large U.S. Army facility was constructed in the Pittsburg area. Called Camp Stoneman, this post was constructed between 1941 and 1942 on land just south of Antioch and Pittsburg. It served as the San Francisco Port of Embarkation's primary troop staging center. From 1942 to its closure in 1954, Camp Stoneman processed over one million soldiers disembarking to the Pacific Theater during World War II and the Korean War. Most troops arrived via the AT&SF or SPRR, both of which constructed spur lines to service the camp. This was a period of dramatic increases in rail transportation with the greatest magnitude of change on the West Coast. SPRR set all time freight and passenger records between 1941 and 1945. During this four-year interval, the volume of traffic in California increased eight-fold, a major portion of which was handled over SPRR lines in the greater San Francisco Bay region.[13] At peak capacity, Camp Stoneman could accommodate 20,000 troops; the average stay was two weeks. In addition to this massive influx of troops and equipment, the camp also stimulated the local economy by employing hundreds of local citizens. [14]

Along with all the other buildings and infrastructure of this post, the Army built a sewage treatment facility on the outskirts of Pittsburg, some distance from the main camp. Buildings and structures on the Proposed Pittsburg Converter Station, Standard Oil Site, and evaluated in this report, include tanks that once served as part of this sewage treatment plant, although nearly all other elements of the camp have been removed or razed.[15] In 1954, shortly after the end of the Korean War, Camp Stoneman was decommissioned and its buildings sold. By the mid-1960s, many of the buildings had been dismantled or destroyed and some of the few that

[12] USGS, *Karquines Quadrangle*; USGS, *Antioch Quadrangle*; *Polk's Pittsburg-Antioch City Directory* (San Francisco: R.L. Polk and Co., 1931, 1947, 1945-1950, 1952-1953, 1955, 1959, 1964, 1971, 1978), p. 153.

[13] During the war years, the SPRR made great strides in improvements to rolling stock, traffic control, and installation of 1,400 miles of heavier duty rails, such as the sidings at Camp Stoneman. The Camp Stoneman spur still operates today, despite the decommissioning of the military base it once served. The line has been extensively refurbished and upgraded since its construction, and does not retain historic integrity. Don L. Hofsommer, *The Southern Pacific: 1901-1985* (College Station: Texas A&M University Press, 1986); Heath, *Seventy-Five Years of Progress*, 44-50.

[14] R. Christopher Goodwin & Associates, Inc., "Support and Utility Structures and Facilities (1917-1946), Overview, Inventory, and Treatment Plan," prepared for Department of the Navy, Atlantic Division, May 1995; US Army, *San Francisco Port of Embarkation*, ca. 1947; California State Military Department, "Historic California Posts: Camp Stoneman," accessed at http://www.militarymuseum.org/CpStoneman.html on September 22, 2005; Nilda Rego, "Pittsburg dismayed by Stoneman's final orders," *Contra Costa Times*, 26 April 1997.

[15] JRP Historical Consulting, "Historical Resources Evaluation Report, State Route 4 (e) Widening Project, Loveridge Road to State Route 160, Contra Costa County, California, P.M. 23.5/25.8," prepared for Parsons Transportation Group, September 2002; R. Christopher Goodwin & Associates, Inc., "Support and Utility Structures and Facilities (1917-1946), Overview, Inventory, and Treatment Plan," prepared for Department of the Navy, Atlantic Division, May 1995; US Army, *San Francisco Port of Embarkation*, ca. 1947.

remained became part of the Camp Stoneman Industrial Park. The parcel of land containing the sewage treatment facility was also sold, and for many years was used as an automotive salvage yard. At least three other buildings were built on the parcel during this time, although only two of the more recent buildings remain, and all of these have been substantially altered and are in disrepair.

3.4. Industrial Development in the Second Half of the 20th Century

World War II and its attendant economic boom greatly increased industrial activities in the Pittsburg and Antioch area, and steel production became the dominant industry. The Columbia-Geneva Steel Company, by this time a division of US Steel and one of the dominant industries in the Pittsburg area, had steadily expanded operations since the company first opened early in the 20th century, supplying steel casings for machinery utilized in dredges, ships, and the lumber industry. US Steel further expanded the operations of Columbia-Geneva Steel after purchasing the company. The newly enlarged division sprawled over approximately 1,000 acres in Contra Costa County, employing up to 6,000 people at the peak of its operations. In 1947, the Columbia-Geneva division claimed to have the largest steel plant on the Pacific Coast, employing 3,000 people and producing products ranging from small steel tacks to massive castings weighing thousands of pounds. By this time, the company had constructed a large industrial building south and west of the Camp Stoneman sewage disposal tanks (outside of the Proposed Pittsburg Converter Station, Standard Oil Site). Built in 1942, this building gradually expanded over the years, supported operations of the steel mill to the north, eventually, under new ownership (Figure C). It was evaluated in 1999 and found not eligible for either the National Register or California Register (see P-07-000827, Appendix B).

Though US Steel dominated the local economy, Pittsburg had a diverse industrial sector. To the west of the city, a number of industries developed. By 1953, the area was home to the Continental Can Company; the Stanley Works; and Gladding, McBean and Company, which operated one of the largest refractory brick plants in the West. These buildings are located to the south, and southwest of West 10th Street, outside the study area for this project. To the northwest of the Alternative Pittsburg Converter Station, W. 10th Street Site, a large area of tidal wetlands extends inland from the waterfront and has historically limited the extent of industrial development. By 1954 however, a large PG&E electrical power plant and substation occupied a parcel on Suisun Bay, just north of the study area. To the immediate north, gradual construction of a tank farm occurred, eventually consisting of nine large tanks (Figure C).[16]

[16] Josiah W. Barkley, *Official Map of Contra Costa County* (Martinez, California: Contra Costa County, 1954); California Division of Mines, "Geologic Guidebook of the San Francisco Bay Counties," *Bulletin 154* ([San Francisco, Division of Mines: 1951), 248; Daniel L. Mosier, *California Bricks*, accessed at http://calbricks.netfirms.com/brickhistory.html on September 30, 2005; *USGS, Honker Bay, Calif. 7.5' Quadrangle* (Washington D.C.: USGS, 1953, 1968, 1975, 1980).

3.5. History of the Central Waterfront District, San Francisco

Development of San Francisco's Central Waterfront District began in the 1850s when some of San Francisco's industries relocated from south of the Market area. Also known as Potrero Point, the Central Waterfront was attractive because of its remote location and deep-water frontage. Key San Francisco industries such as ship-building have long been represented in this part of the city, as well as a wide variety of manufacturing businesses that made rope, explosives, soap, barrels, iron, and sugar. The largest industry to locate in the area was the Union Iron Works (UIW) plant in 1883, which manufactured mining equipment as well as ships. In 1905, Bethlehem Steel acquired UIW and greatly expanded the shipbuilding operation. Shipping and distribution facilities also predominate in this area of wharves, warehouses, truck loading docks, and railroad spurs. These trends continued and broadened after World War II with the addition of more manufacturers, like the American Can Company, as well as new wholesale, warehousing, and distribution enterprises. None of the remaining iron, steel, or can manufacturing buildings is within the study areas for the current report.[17]

Development of working-class housing in the area coincided with its industrial growth. Neighborhoods such as Irish Hill and Dogpatch supplied the local industries with cheap labor. Over the years, much of the housing in this area has been demolished, though Dogpatch contains the oldest and most intact concentration of Victorian-era industrial workers' housing in San Francisco. None of these residences is within the study areas for the current report.[18]

In addition, the area included a gas manufacturing plant that evolved into what is now the Potrero Power Plant complex (on the Alternative SF Converter Station, Mirant site). The first gas manufacturing plant built in this area was completed in 1872. Two early San Francisco lighting fuel enterprises merged a year later to operate the plant, forming the San Francisco Gas Light Company. Lighting fuel made from oil or coal dominated the market before advances in electric generation and transmission made the process obsolete. During the rest of the nineteenth century, the gas plant was surrounded by other large industrial complexes, including the Western Sugar Refinery and the iron and steel factories along the wharves to the north. By the late nineteenth century, Spreckles built a large steam powered electric generation plant on what is now the Alternative SF Converter Station, Mirant site. The predecessor to Pacific Gas & Electric Company (PG&E) bought the electric plant in the early 1900s and the facility became known as Station A.[19]

PG&E operated Station A for more than eighty years, combining it with the nearby gas manufacturing plant, and expanding the complex to include many state-of-the-art buildings and

[17] San Francisco Planning Department, "Draft for Public Review: The Central Waterfront Neighborhood Plan," December 2002, p.14-16; Christopher Ver Plank, Prepared Testimony for the City and County of San Francisco, Mirant's Potrero Power Plant Unit 7 Hearings, 00-AFC-4, July 10, 2002, p.4.

[18] San Francisco Planning Department, "Draft for Public Review: The Central Waterfront Neighborhood Plan," December 2002, p.15; Gloria Scott, Prepared Testimony for the City and County of San Francisco, Mirant's Potrero Power Plant Unit 7 Hearings, 00-AFC-4, July 10, 2002.

[19] Ward Hill and Laurence H. Shoup, "Draft Historic Architecture Report, Station A, Potrero Power Plant in the City and County of San Francisco," prepared for Dames & Moore (December 1999), 2-6.

structures. Station A survived the San Francisco earthquake in 1906 and was the largest steam-powered electricity generating facility west of the Rocky Mountains through 1913. PG&E built the Meter House and Compressor House to improve the gas plant operations of the Station A complex in the 1910s when gas manufacturing was still an important aspect of their business. The gas plant services were supplanted by natural gas in the late 1920s, but PG&E kept the gas plant facilities on standby until about 1960 (see Figure D). PG&E remodeled and expanded the main Station A building in 1930, including upgrading the pump house and sea water intake and discharge system. PG&E expanded the Station A complex again in the 1950s and 1960s, eastward towards the bay, after the Western Sugar Refinery closed and the sugar company buildings were torn down. Station A was removed from service in 1983.[20]

The warehouses located at 435 23rd Street, on the Proposed SF Converter Station, HWC site, were built in 1923 and 1929 by the Western Sugar Refinery (see Figure E). Claus Spreckles was the pre-eminent sugar producer in California during the late nineteenth century and had several sugar refineries in operation by the time he established this refinery site at the east end of 23rd Street in 1881. The refinery complex grew to include numerous buildings and structures over the next sixty years of operation, including a melt wash house, melt filter house, boilers, water tanks, worker housing, conveyors, docks, and various warehouses. Spreckles' sons inherited the family sugar empire and had the two warehouses at 435 23rd Street built in the 1920s during a period of intense competition with rival manufacturer, C and H Sugar. Although the Western Sugar Company facility once stretched for four blocks along both sides of 23rd Street, the plant shut down in 1949 and many of the buildings were removed soon after as PG&E expanded its adjacent Station A power plant. None of the sugar company complex remains except for the two warehouses at 435 23rd Street (Proposed SF Converter Station, HWC).[21]

4. DESCRIPTION OF RESOURCES

The following section describes the resources found at the four study area sites: Proposed Pittsburg Converter Station, Standard Oil Site; Alternative Pittsburg Converter Station, W. 10th Street Site; Proposed SF Converter Station, HWC Site; and Alternative SF Converter Station, Mirant Site. The following provides an overview of the buildings and structures on each site. Refer to the DPR 523 forms in Appendix B for full descriptions and photographs.

4.1. Proposed Pittsburg Converter Station, Standard Oil Site, Pittsburg

The Proposed Pittsburg Converter Station, Standard Oil Site is located in an industrial area east of Pittsburg. Research revealed the first development on the property began in the early 1940s during the construction of nearby Camp Stoneman. This US Army facility was built during World War II to process troops for embarkation to various operational fronts and what is now the Proposed Pittsburg Converter Station, Standard Oil Site was built as part of the infrastructure for

[20] Ward Hill and Laurence H. Shoup, "Draft Historic Architecture Report, Station A, Potrero Power Plant in the City and County of San Francisco," prepared for Dames & Moore (December 1999), 2-6.

[21] Corbett, URS Corporation, "Historic Architecture Report for 435 23rd Street, City and County of San Francisco, California" (2001), R3-4 through R3-7.

that mission. At one time the site contained at least four cylindrical wastewater treatment tanks, however only two of these remain. The site operated as a sewage treatment facility for the camp through the Korean War, after which it was decommissioned. The property was sold and was used for some time as an automobile salvage yard. Several small, dilapidated and substantially altered buildings that date to after 1954 now occupy the site with the remaining two tanks. The tanks are of poured concrete construction while the buildings vary widely in construction material including poured concrete, steel, wood siding, and plywood.[22]

4.2. Alternative Pittsburg Converter Station, W. 10th Street Site, Pittsburg

The Alternative Pittsburg Converter Station, W. 10th Street Site is located on the western edge of Pittsburg. To the east and south are residences; to the north and west are industrial tank farms and tidal wetlands. The study area includes all, or portions of, eight legal parcels on the north side of West 10th Street. Light industrial and roadside commercial buildings characterize the area. Steel framing is common, as is raised ridge siding, corrugated steel, low to medium pitched rolled composition roofs, and concrete foundations. The buildings are modest, utilitarian, and in some cases substantially modified and seriously dilapidated. Most date to the 1950s, but range from the 1940s to the 1980s.

4.3. Proposed SF Converter Station, HWC Site, San Francisco

The Proposed SF Converter Station, HWC Site is located in southeastern San Francisco in an industrial area on the western shore of San Francisco Bay commonly referred to as the Central Waterfront District. The site contains two buildings that once served as warehouses for the Western Sugar Refinery, one constructed in 1923, the other in 1929. Both are rectangular, and are arranged end to end, on an east-west axis. The framing is steel with reinforced concrete walls and foundation. The easternmost building (1923) is six bays wide and 20 bays long, and a central row of columns with a fire wall. The walls are 36 feet high with industrial steel frame windows at the top. The western warehouse (1929) is eight bays wide and 16 bays long, with loading docks on three sides. The sugar company complex once consisted of numerous nineteenth and twentieth century buildings located on more than four blocks east to west on either side of 23rd street. The complex included at least 16 buildings, two water tanks, a fuel tank, wharves, railroad spurs, and roadways. Later additions included a ten-story reinforced-concrete building (1915), and the two steel and concrete warehouses in 1923 and 1929. The warehouses are located on the Proposed SF Converter Station, HWC site being studied for this

[22] USGS, *Antioch North, Calif., 7.5' Topographic Map* (Washington D.C.: USGS, 1953, 1968, 1978); JRP Historical Consulting, "Historical Resources Evaluation Report, State Route 4 (e) Widening Project, Loveridge Road to State Route 160, Contra Costa County, California, P.M. 23.5/25.8," prepared for Parsons Transportation Group, September 2002; R. Christopher Goodwin & Associates, Inc., "Support and Utility Structures and Facilities (1917-1946), Overview, Inventory, and Treatment Plan," prepared for Department of the Navy, Atlantic Division, May 1995; US Army, *San Francisco Port of Embarkation*, ca. 1947; Nilda Rego, "Pittsburg dismayed by Stoneman's final orders," *Contra Costa Times*, 26 April 1997; California State Military Department, "Historic California Posts: Camp Stoneman," accessed at http://www.militarymuseum.org/CpStoneman.html on September 22, 2005.

project, but nearly all of the other buildings of the sugar refinery complex were demolished in the 1950s. Currently, none of the refinery complex remains except for the two warehouses.[23]

4.4. Alternative SF Converter Station, Mirant Site, San Francisco

Located at 1201 Illinois Street, north of 23rd Street, the Alternative SF Converter Station, Mirant Site includes the former power plant known as Station A, and other historic era buildings: the Meter House, Compressor House, and Gate House. (The Pump House has been demolished). The San Francisco Gas and Electric Company built Station A in 1901 and the company's successor, Pacific Gas & Electric Company (PG&E) remodeled it in 1930. The Station A building consists of a 65-foot tall turbine room that is 121 feet wide and 435 feet long. A large boiler room with roughly the same dimensions as the turbine room and located along the turbine room east wall, was demolished in 1983. The Station A building was connected via underground conduits to the Pump House (built in 1930 and demolished about 2004) which pumped water from the bay for use in the power plant condensers. This sea water was discharged after use into Warm Water Cove via a tunnel, which was probably installed to replace an earlier discharge pipe as part of the 1930 remodeling project. The Meter House and Compressor House are the last examples of facilities used in the gas manufacturing process in San Francisco dating to before 1930. The Meter House (1914) has load-bearing brick walls, segmental-arch windows, and steel roof trusses and the Compressor House (1924) is L-shaped in plan, with a steel frame, brick exterior walls with Renaissance/Baroque details, and a gable roof with a ridge monitor. The Gate House (1901) is a small brick building with a rectangular plan and modest classical details at the façade.[24] The integrity of these resources and status of historical evaluations of the resources are described in Section 5.2.

5. FINDINGS AND CONCLUSIONS

5.1. Evaluation Criteria

JRP used the criteria of the California Register of Historical Resources (CRHR) and the National Register of Historic Places (NRHP) to evaluate the historic significance of the properties within the study area. The previous evaluations of resources in San Francisco also appropriately

[23] Corbett, URS Corporation, "Historic Architecture Report for 435 23rd Street, City and County of San Francisco, California" (2001), R3-8; URS, Responses to CEC Data Requests (Set 6), Cultural Resources, Cooling Tower System Amendment, Potrero Power Plant Unit 7, 00-AFC-4, September 2003.

[24] Sanborn Maps, *San Francisco*, Volume 6, 1914, revised 1936 and 1950; "The Independent Electric Light and Power Company," *The Journal of Electricity, Power, and Gas* (December 1901): 269-279; Gloria Scott, Staff's Supplemental Prepared Testimony Regarding Cultural Resources, Mirant's Potrero Power Plant Unit 7 Hearings, 00-AFC-4, July 10, 2002; Dames & Moore, Historic Architecture Report, Station A, Potrero Power Plant in the City and County of San Francisco, California (1999); URS, Responses to CEC Data Requests (Set 6), Cultural Resources, Cooling Tower System Amendment, Potrero Power Plant Unit 7, 00-AFC-4, September 2003; Hill and Shoup, "Draft Historic Architecture Report, Station A …," prepared for Dames & Moore (December 1999).

applied the CRHR criteria. These evaluation criteria are consistent with the historic preservation ordinances of both the City of Pittsburg and the City of San Francisco.

The State of California references cultural resources in the California Environmental Quality Act (CEQA—Public Resources Code (PRC) Division 13, Sections 21000-21178); archaeological and historical resources are specifically treated under Sections 21083.2 and 21084.1, respectively. California PRC 5020.1 through 5024.6 (effective 1992) creates the California Register of Historical Resources (CRHR) and sets forth requirements for protection of historic cultural resources. The criteria for listing properties in the CRHR are in Section 15064.5(a)(2)-(4) of the CEQA Guidelines, which provide the criteria from Section 5024.1 of the California Public Resources Code. The CRHR is in the California Code of Regulations Title 14, Chapter 11.5. The CRHR criteria closely parallel those of the NRHP. The eligibility criteria for listing properties in the NHRP are codified in Code of Federal Regulations 36 Part 60 and explained in guidelines published by the Keeper of the National Register.

Eligibility for listing in either the NHRP or CRHR rests on twin factors of significance and integrity. A property must have both significance and integrity to be considered eligible. Loss of integrity, if sufficiently great, will overwhelm historical significance a property may possess and render it ineligible. Likewise, a property can have complete integrity, but if it lacks significance, it must also be considered ineligible.

Historic significance is judged by applying the NRHP and CRHR criteria. The NRHP criteria are identified as Criteria A through D, the CRHR as Criteria 1 through 4. The NRHP guidelines require that a historic resource's "quality of significance in American history, architecture, archeology, engineering, and culture" be determined by meeting at least one of the four main criteria. Properties may be significant at the local, state, or national level:

- NRHP Criterion A (CRHR Criterion 1): association with events or trends significant in the broad patterns of our history;
- NRHP Criterion B (CRHR Criterion 2): association with the lives of significant individuals;
- NRHP Criterion C (CRHR Criterion 3): a property that embodies the distinctive characteristics of a type, period, or method of construction, represents the work of a master, or that possesses high artistic values;
- NRHP Criterion D (CRHR Criterion 4): has yielded, or is likely to yield information important to history or prehistory.

In general, NRHP Criterion D (CRHR Criterion 4) is used to evaluate historic sites and archaeological resources. Although buildings and structures can occasionally be recognized for the important information they might yield regarding historic construction or technologies, the properties within the study area for this Project are building types that are well documented. Thus, these properties are not principal sources of important information in this regard.

Certain property types are usually excluded from consideration for listing in the NRHP, but can be considered if they meet special requirements in addition to meeting the regular criteria. The

following are the seven Criteria Considerations that deal with properties usually excluded from listing in the National Register: [25]

- Consideration A: Religious Properties
- Consideration B: Moved Properties
- Consideration C: Birthplaces and Graves
- Consideration D: Cemeteries
- Consideration E: Reconstructed Properties
- Consideration F: Commemorative Properties
- Consideration G: Properties that have Achieved Significance within the Past Fifty Years

Integrity is determined under NRHP guidelines through applying seven factors to the historic resource. Those factors are location, design, setting, workmanship, materials, feeling, and association. These seven can be roughly grouped into three types of integrity considerations. Location and setting relate to the relationship between the property and its environment. Design, materials, and workmanship, as they apply to historic buildings, relate to construction methods and architectural details. Feeling and association are the least objective of the seven criteria, pertaining to the overall ability of the property to convey a sense of the historical time and place in which it was constructed.

The CRHR definition of integrity and its special considerations for certain properties are slightly different than those for the NRHP. Integrity is defined as "the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance." The CRHR further states that eligible resources must "retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance" and it lists the same seven aspects of integrity used for evaluating properties under the NRHP criteria. The CRHR's special considerations for certain properties types are limited to: 1) moved buildings, structures, or objects; 2) historical resources achieving significance within the past fifty years; and 3) reconstructed buildings.

Under CEQA Guidelines, Section 15064.5 (a), a "historical resource" includes:

- A resource listed in or eligible for the California Register of Historical Resources;
- A resource listed in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements of section 5024.1(g) of the Public Resources Code;
- Any object, building, structure, site, area, place, record, or manuscript that a lead agency determines historically significant, provided the determination is supported by substantial evidence in light of the whole record;
- A resource so determined by a lead agency as defined in Public Resources Code sections 50203.1(j) or 5024.1.

[25] USDI, National Park Service, "How to Apply the National Register Criteria for Evaluation," *National Register Bulletin 15*, 25, 41-43; USDI, National Park Service, "Guidelines for Evaluating and Nominating Properties that have Achieved Significance within the Last Fifty Years," *National Register Bulletin No. 22* (Washington, D.C.: Government Printing Officer, 1979, revised 1990 and 1996).

- Historical resources listed in, or determined eligible for, the NRHP are automatically listed in the CRHR, Section 5024 (d)(1)(2) of the Public Resources Code.

The City and County of San Francisco has two sections of its Planning Code that deal specifically with the preservation of historic resources: Article 10 created the Landmarks Preservation Advisory Board and deals with the designation of landmarks and historic districts throughout the City; and Article 11 deals with the preservation of historic buildings and creation of historic districts. The Landmarks Preservation Advisory Board makes recommendations to the Planning Department and Commission on the designation of landmarks and districts as well as the appropriateness of changes to historic buildings under the protection of Article 10 and permits to alter under Article 11. The City-designated structures and districts in Articles 10 and 11 are presumed historic resources under CEQA as they are on a local register. In addition, resources listed or determined eligible for listing in the CRHR or the NRHP are also considered historic resources under CEQA.

The City of Pittsburg has a historic preservation ordinance, specifically, Title 15 Pittsburg Municipal Code, Chapter 15.84. A resource that meets any of the following criteria can be designated as historic by the Pittsburg City Council: 1) Historical and Cultural Significance; 2) Historic, Architectural, and Engineering Significance; 3) Neighborhood and Geographic Setting. Although the historic preservation ordinance provides for the creation of an inventory of historic resources within the City of Pittsburg, no such inventory has yet been established.[26]

5.2. Historic Evaluation

Proposed Pittsburg Converter Station, Standard Oil Site. No historical resources present. The buildings and structures on this site do not appear to meet the criteria for listing in the National Register of Historic Places, nor are they historical resources for the purposes of CEQA. Two of the buildings date to the early 1940s and are associated with Camp Stoneman, a large U.S. Army facility that was constructed south of Pittsburg during the first years of World War II when it served as the San Francisco Port of Embarkation's primary troop staging center. In 1954, shortly after the end of the Korean War, Camp Stoneman was decommissioned and its land and buildings were sold. None of the buildings on the parcel appears eligible for the National Register or California Register because they are not historically or architecturally significant, and because they lack integrity. The sewage treatment plant was part of the infrastructure necessary for the operation of Camp Stoneman playing a practical role in support of the overall mission of the installation. This routine function does not have important specific association with an event or pattern of events, either in the history of Camp Stoneman, or the broader contexts of World War II, Korean War, or military history (Criterion A).[27] None of the other buildings and structures demonstrates associations with events significant to the history of the area following its sale after Camp Stoneman was decommissioned. The resources do not have associations with any known significant persons (Criterion B).

[26] Pittsburg Municipal Code, Title 15, Buildings and Construction of the, Chapter 15.84, Preservation of Historic Structures and Establishment of Historical District, Section 15.84.050.

[27] R. Christopher Goodwin & Associates, Inc., "Support and Utility Structures and Facilities (1917-1946), Overview, Inventory, and Treatment Plan," prepared for Department of the Navy, Atlantic Division, May 1995, 286.

Furthermore, none of the buildings appears eligible under Criterion C. The two remaining tanks were once part of a much larger facility that included at least two other tanks, as well as settling ponds and other equipment, as do not retain integrity as originally designed. The other utilitarian, wood-frame, one-story buildings are small and unremarkable and have been altered over the years.[28] These structures do not embody distinctive architectural or engineering qualities of a type, period, or method of construction under Criterion C. The former Pittsburg alignment that parallels the west boundary of the Proposed Pittsburg Converter Station, Standard Oil Site has been dismantled and no longer retains historic integrity. The former AT&SF and SPRR railroad lines, that run past the north and south ends of the study area have been extensively refurbished and upgraded since the alignments were originally established in the nineteenth century and do not retain historic integrity. Finally, the resource has not yielded, nor is likely to yield, information important in prehistory or history (Criterion D). This property has also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code and does not appear to meet the significance criteria as outlined in these guidelines.

Alternative Pittsburg Converter Station, W. 10th Street Site. No historical resources present. The Alternative Pittsburg Converter Station, W. 10th Street Site in this project consists of 15 parcels north of W. 10th Street and south of the former Sacramento Northern Railroad line, on the western edge of the City of Pittsburg. Some of the buildings or structures located on these parcels date to the 1940s and early 1950s and were inventoried and evaluated as part of the survey conducted for this project. These roadside commercial businesses (including automotive repair and salvage, construction supply, a motel, and other businesses) are typical post World War II construction. All of the buildings inventoried have been modified since their original construction, and none of them appears to have historic significance. The businesses are not important within the context of the history of the City of Pittsburg, or state or national history. The former Sacramento Railroad line, just outside the Alternative Pittsburg Converter Station, W. 10th Street Site study area to the north, has been extensively realigned and altered since the alignment was originally established in the nineteenth century and does not retain historic integrity.

Proposed SF Converter Station, HWC. The two former sugar warehouses at 435 23rd Street, San Francisco, on parcel 4232-10, are eligible for the California Register of Historical Resources under Criterion 1, at the local level of significance. They are historical resources for the purposes of CEQA. The warehouses are the last remaining structures of the Western Sugar Refinery complex on 23rd Street, along the waterfront. These two warehouses are representative of the historically important sugar industry in San Francisco and the only sugar company with San Francisco refinery operations.[29] The warehouses are located on the Proposed SF Converter

[28] Goodwin & Associates, "Support and Utility Structures and Facilities (1917-1946)," 58.

[29] Corbett, URS Corporation, "Historic Architecture Report for 435 23rd Street, City and County of San Francisco, California" (2001). There is third building at the west end of the parcel that is less than forty years old and is not a historical resource for the purpose of CEQA.

Station, HWC site being studied for this project, but nearly all of the other sugar refinery buildings were demolished in 1950.[30]

The warehouses at 435 23rd Street buildings were evaluated in 2001 by a qualified architectural historian who concluded that they were eligible for the California Register as the last remaining structures associated with the Western Sugar Refinery (Criterion 1). The historical setting, feeling and association of the buildings have been substantially changed since the end of their period of significance, but the buildings themselves retain integrity of materials, design, workmanship, and location.[31] The warehouses did not appear in the CHRIS Historic Property Datafile for San Francisco as of August 2005, however, the warehouses are considered a potential historical resource by the City of San Francisco, and are therefore considered historical resources for the purposes of CEQA.

Alternative SF Converter Station, Mirant. The former power plant complex, also known as Station A, is located on parcel 4232-06 and 4175-06 at 1201 Illinois Street, San Francisco. The complex is north of 23rd Street, within the Alternative SF Converter Station, Mirant study area for this project. Four buildings of the Station A complex are considered to be historical resources for the purposes of CEQA. The Meter House and Compressor House are considered historical resources because they meet at least one of the criteria for listing in the California Register of Historical Resources (CRHR). The Station A building and Gate House are considered historical resources for the purposes of CEQA because they are treated as historical resources by the City and County of San Francisco.[32]

The Station A complex has undergone numerous changes that have diminished the historic integrity of the resources within the complex that date to the historic period. About half of the Station A building itself, the boiler room, was demolished for the construction of a modern switchyard in 1983. This demolition substantially reduced the historic integrity of Station A by removing at least fifty percent of the building. The integrity of the complex as a whole was further compromised by the demolition of a row of shop buildings that extended all along the east side of the boiler room, including the Boiler Shop, Pattern Shop, Pipe Shop, Tin and Copper Shop, and storage buildings. The Pump House was demolished in about 2004. The late nineteenth century and early twentieth century setting of the Station A complex has also changed dramatically over the last several decades. The large gas tanks west of Station A that were built in the early 1900s have been removed and the area is now occupied by an electrical switchyard. Various steam plant and gas manufacturing support buildings located near the Station A complex were also demolished in the decades between the 1950s and 1980s. PG&E built a 305-foot stack and a multi-story generation unit east of Station A in the 1960s. These changes have compromised the integrity of setting, feeling, and association of the remaining buildings.

[30] URS, Responses to CEC Data Requests (Set 6), Cultural Resources, Cooling Tower System Amendment, Potrero Power Plant Unit 7, 00-AFC-4, September 2003.

[31] Corbett, URS Corporation, "Historic Architecture Report for 435 23rd Street, City and County of San Francisco, California" (2001).

[32] Ward Hill and Laurence H. Shoup, "Draft Historic Architecture Report, Station A, Potrero Power Plant in the City and County of San Francisco," prepared for Dames & Moore (December 1999) and included in Dames & Moore, Historic Architecture Report, Station A, Potrero Power Plant in the City and County of San Francisco, California (1999). The Hill and Shoup evaluation addressed five historic are buildings (the Station A Power Plant building, Pump House, Gate House, Compressor House, and Meter House).

The conclusion of the 1999 evaluation of the building (by Hill and Shoup) was that the Station A building did not retain enough integrity to be eligible for the CRHR. This evaluation concluded that the Gate House, which was originally attached to the southeast corner of the Station A boiler, was not architecturally or historically significant and did not retain integrity of design because it was no longer connected to Station A. The 1999 evaluation also concluded that the Pump House, once located on 23rd Street east of the Station A building (and since demolished), was not architecturally or historically significant. The evaluation did conclude that two buildings, the Meter House and Compressor House, did generally retain integrity (with the exception of metal roll-up doors in both buildings) and were eligible for the California Register under Criterion 1.[33] Nevertheless, as described in more detail below, the City and County of San Francisco treats the Station A complex as a historical resource for the purposes of CEQA.

Cultural resources staff and consulting historic architecture experts for the City and County of San Francisco (CCSF) testifying in hearings related to the Potrero Power Plant Unit 7 project (00-AFC-4), stated that the Station A complex was eligible for the CRHR under Criterion 1 and Criterion 3 (see summary lists below). The CCSF experts were also of the opinion that the Station A complex could contribute to part of a potential historic district (see discussion of districts in section 5.2.1, below).[34] Neither the 1999 evaluation, nor the testimony regarding the complex has specifically addressed the sea water delivery or discharge pipes / tunnels that once connected Station A to the Pump House. For the purposes of this project, therefore, the sea water delivery and discharge system is considered a component of the Station A complex historical resource.

The following lists summarize previous evaluation, testimony, and historical status of the Station A complex to date:

Ward Hill evaluation of Station A complex (1999):[35]

- Station A — Not eligible due to loss of integrity
- Gate House — Not eligible due to loss of integrity
- Pump House — Not eligible due to loss of integrity (since demolished)
- Meter House — Eligible under Criteria 1 (association with trends in history)
- Compressor House — Eligible under Criteria 1 (association with trends in history)

[33] Hill and Shoup, "Draft Historic Architecture Report, Station A, Potrero Power Plant in the City and County of San Francisco," prepared for Dames & Moore (December 1999) and included in Dames & Moore, Historic Architecture Report, Station A, Potrero Power Plant in the City and County of San Francisco, California (1999).

[34] San Francisco Planning Department, "Draft for Public Review: The Central Waterfront Neighborhood Plan," December 2002; Christopher Ver Plank, Prepared Testimony for the City and County of San Francisco, Mirant's Potrero Power Plant Unit 7 Hearings, 00-AFC-4, July 10, 2002; Mark Paez, Prepared Testimony for the City and County of San Francisco, Mirant's Potrero Power Plant Unit 7 Hearings, 00-AFC-4, November 27, 2002; Charles E. Chase, Prepared Testimony for the City and County of San Francisco, Mirant's Potrero Power Plant Unit 7 Hearings, 00-AFC-4, July 10, 2002; URS, Responses to CEC Data Requests (Set 6), Cultural Resources, Cooling Tower System Amendment, Potrero Power Plant Unit 7, 00-AFC-4, September 2003.

[35] Ward Hill and Laurence H. Shoup, "Draft Historic Architecture Report, Station A, Potrero Power Plant in the City and County of San Francisco," prepared for Dames & Moore (December 1999).

Testimony of Selected Expert Witnesses for City & County of San Francisco (2002):[36]

- Mark Paez, Planner, Port of San Francisco Planning and Development Division. Testified that, "…although the Pier 70 Area is not formally designated as an historic district, the Port treats the area as an historic district in its Pier 70 interim use, leasing, land use and planning activities, including environmental review pursuant to the California Environmental Quality Act (CEQA."
- Paul Groth, Associate Professor of Architectural History, UC Berkeley. Testified that the Station A complex appeared historically significant, even with the removal of half the original Station A building. Testified that the various historic resources on Potrero Point retained integrity of setting and feeling.
- Christopher ver Plank, Architect, Page & Turnbull, San Francisco. Testified that the Station A complex, aka "… the historic portion of the Potrero Power Plant, is eligible for listing in the National Register as a historic district."

Testimony of Expert Witness for California Energy Commission (2002)

Gloria Scott, consulting architectural historian for the CEC, provided a description of the historic surveys and evaluations that had taken place in this part of the City and County of San Francisco (CCSF) at that time (July 2002):[37]

- CCSF conducted a large survey that identified three historic districts: Dogpatch; Union Iron Works / Pier 70; and Industrial-Type Buildings on Third Street.
- The Union Iron Works / Pier 70 district included the Potrero Power Plant complex
- CCSF submitted the survey to OHP. At the time of Scott's testimony, OHP had returned the survey on a technicality.
- Scott noted that, as of 2002, CCSF "…treats the district as if it is eligible for listing in the National Register."
- By August 2005, the survey, or at least large portions of the survey, had been accepted by OHP and were included in CHRIS.

California Historic Resources Inventory System (CHRIS), as of 08-08-2005

- Station A, Potrero Power Plant NRHP Status 7[38]
- Station A Buildings NRHP Status 7
- Gate House NRHP Status 7
- Compressor House NRHP Status 7
- Meter House NRHP Status 7

[36] Mark Paez, Prepared Testimony for the City and County of San Francisco, Mirant's Potrero Power Plant Unit 7 Hearings, 00-AFC-4, November 27, 2002; Paul Groth, Prepared Testimony for the City and County of San Francisco, Mirant's Potrero Power Plant Unit 7 Hearings, 00-AFC-4, July 8, 2002; Christopher Ver Plank, Prepared Testimony for the City and County of San Francisco, Mirant's Potrero Power Plant Unit 7 Hearings, 00-AFC-4, July 10, 2002.

[37] Gloria Scott, Staff's Supplemental Prepared Testimony Regarding Cultural Resources, Mirant's Potrero Power Plant Unit 7 Hearings, 00-AFC-4, July 10, 2002.

[38] Status 7 indicates that OHP has received information, but that the resource was "not evaluated for National Register or California Register or needs re-evaluation," OHP, "User's Guide to the California Historical Resource Status Codes & Historic Resources Inventory Directory," *Technical Assistance Bulletin #8* (November 2004), 5.

The CHRIS Historic Property Datafile for San Francisco (as of August 2005) lists the Station A building, the Meter House, the Compressor House, and the Gate House as status "7," or not evaluated. This indicates that the Office of Historic Preservation and the State Historical Resources Commission have received information, but that a determination has not been made.

In conclusion, because the City of San Francisco considers the Station A complex to be a historical resource, the complex is considered a historical resource (multi-component) for the purposes of CEQA, and for the purposes of this project. Not only is the Station A complex considered to be a multi-component historical resource, it is also considered to be a possible contributor to a potential historic district.

5.2.1. San Francisco – nearby Historic Districts

Cultural resources experts for the City of San Francisco testifying in hearings related to the Potrero Power Plant Unit 7 project (00-AFC-4) stated that the Station A complex, as well as other resources north and east of the study areas for this project, appear to be contributing elements of a larger industrial district with potential historic significance. These other resources include the Union Iron Works/Bethlehem Steel at Pier 70, the remnants of Irish Hill, the American Can Company buildings, and the Western Sugar Refinery warehouses (435 23rd Street – Proposed SF Converter Station, HWC).

No such larger district has been formally nominated to the CRHR or NRHP, however, identification and survey of these potential districts is on-going. The San Francisco Planning Department surveyed more than 140 pre-1956 resources in the Central Waterfront area in 2000-2001 as part of its Central Waterfront Neighborhood Plan. The survey included the Potrero Point area and the Pier 70 resources – all north and east of the study areas for this project. None of the buildings at the Alternative SF Converter Station, Mirant, or the Proposed SF Converter Station, HWC, appear to have been evaluated as part of the Central Waterfront Survey. The Port of San Francisco considers the Pier 70 area to be a historic district, even though it is not officially designated as such by the City of San Francisco, nor is it listed on the CRHR or NRHP.[39] The Pier 70 area is generally north of study areas for this project. Finally, the City of San Francisco surveyed and evaluated the Dogpatch Historic District under a separate effort. This district appears to be eligible for the CRHR and NRHR, but it is well to the northeast of the study areas for this project.[40]

[39] Mark Paez, Prepared Testimony for the City and County of San Francisco, Mirant's Potrero Power Plant Unit 7 Hearings, 00-AFC-4, November 27, 2002. Note: Some portions of the Pier 70 complex have been found ineligible for the NRHP according to the most recent CHRIS Historic Properties Datafile (resource numbers 135306, 135308, and 135309), status code 6Z1. Evaluation of the Union Iron Works Pier 70 complex was included in a report by Carey & Co, entitled "Historic Resources Report, Southern Waterfront, San Francisco, California" (1994).

[40] San Francisco Planning Department, "Draft for Public Review: The Central Waterfront Neighborhood Plan," December 2002; Christopher Ver Plank, Prepared Testimony for the City and County of San Francisco, Mirant's Potrero Power Plant Unit 7 Hearings, 00-AFC-4, July 10, 2002; Mark Paez, Prepared Testimony for the City and County of San Francisco, Mirant's Potrero Power Plant Unit 7 Hearings, 00-AFC-4, November 27, 2002; Charles E. Chase, Prepared Testimony for the City and County of San Francisco, Mirant's Potrero Power Plant Unit 7

While the architectural resources of the Station A complex (Alternative SF Converter Station, Mirant) and the warehouses at 435 23rd Street (Proposed SF Converter Station, HWC), are eligible as individual properties, they may also be contributing elements of a potential, and as yet undefined, historic industrial district. Neither the Station A buildings, nor the sugar warehouses, were ever functionally linked to the other historic districts that have been identified, such as the steel mill and other industries of Pier 70. Workers who lived in what is now the Dogpatch Historic District may have worked at the Station A or sugar refinery (Alternative SF Converter Station, Mirant, and Proposed SF Converter Station, HWC), but this indirect association is not evident in the resources themselves and does not provide the strong visual association or linkage required in defining a historically significant district.[41] Although neither the Station A complex, nor the sugar warehouses, have been formally identified as contributing elements of a historic district, the Port of San Francisco considers the Pier 70 area to be a historic district. These resources, therefore, are considered to be possible contributors to this potential historic district for the purposes of CEQA.

5.3. Impacts Analysis and Suggested Mitigation

The CEQA guidelines Section 15064.5(b) states that "a project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." Substantial adverse change is defined as when a historical resource is materially impaired. This can include demolition of the historical resource, or alterations to the physical characteristics of the historical resource that convey its historical significance and which justifies its eligibility for the CRHR. The lead agency in a project is responsible for mitigating the substantial adverse change and may be able to mitigate some types of impacts to a level that is less than significant.

The construction of the proposed Project in the Pittsburg study areas, including the Proposed Pittsburg Converter Station, Standard Oil Site and the Alternative Pittsburg Converter Station, W. 10th Street Site will not cause a significant adverse change because these sites contain no historical resources. No further study of the Pittsburg study areas is required for historic architectural resources.

The construction of the proposed project at the San Francisco locations, including the proposed SF Converter Station, HWC site, and the Alternative SF Converter Station, Mirant Site, will require demolition of historical resources under either the proposed converter station or alternative converter station options. This action would cause a significant adverse change to the sugar warehouses (proposed SF Converter Station, HWC Site) and to the Station A complex (alternative SF Converter Station, Mirant Site) as individual historical resources under CEQA.

Hearings, 00-AFC-4, July 10, 2002; URS, Responses to CEC Data Requests (Set 6), Cultural Resources, Cooling Tower System Amendment, Potrero Power Plant Unit 7, 00-AFC-4, September 2003.

[41] The National Park Service provided guidance regarding the definition of appropriate boundaries and contributing elements for historic districts. National Park Service, *National Register Bulletin: Defining Boundaries for National Register Properties*, Washington, D.C.: National Register of Historic Places, 1995, revised 1997; National Park Service, *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*, Washington, D.C.: National Register of Historic Places, 1990, revised through 2002.

As possible contributors to potential historic district(s), the demolition or alteration of either the sugar warehouses or the Station A complex resources, would not impair the ability of the potential district(s) to convey historic significance. These activities would not materially impair the significance of the potential district(s) and the impact to the potential historic district(s) would be less than significant.

5.3.1. Mitigation Measures

The mitigation measures proposed in this section are intended to be part of the overall consideration of impacts to historical resources as part of this Project. Demolition of historical resources is a significant adverse change that cannot be mitigated to less than significant. These proposed mitigation options, therefore, will be discussed and refined by the project proponent and other responsible agencies in conjunction with preparation of a Statement of Overriding Concern. Mitigation measures will be set forth in a mitigation monitoring reporting program (MMRP), which will include input from other responsible agencies.

Mitigation measures that could be considered for this project include:

- **Relocation**. Opportunities for relocation of historic properties will be evaluated however, it is unlikely that relocation would be feasible given the scale of the majority of buildings. Should relocation be feasible, the properties to be relocated and the parties to receive title will be identified in the MMRP.

- **Recordation.** Recordation would ensure a permanent record of the present appearance and context of the historical resources. Under this mitigation proposal, the project proponent would ensure that the historical resources to be demolished would be recorded to Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER) standards prior to any construction activities. The HABS/HAER documentation would be filed with the SHPO, the HABS/HAER collection in the Library of Congress, the University of California Bancroft Library, the San Francisco Landmarks Preservation Advisory Board files at the San Francisco Planning Department, the Foundation for San Francisco's Architectural Heritage (FSFAH), and the San Francisco Public Library.

Although recordation eliminates one adverse impact of demolition, the loss of historical information, it does not prevent the physical loss of historically significant resources. Therefore, additional mitigation measures should be developed and could include:

- **Interpretive Display and/or Interpretive Material.** The project proponent would develop a display or interpretive material for public exhibition and dispersal. The display or interpretive material, such as a printed brochure, could be based on the photographs produced in the HABS/HAER documentation, and the historic archival research previously prepared for the resources in and near the project. This display and/or interpretive material would be provided to the City of San Francisco.

- **Salvage Opportunities.** After recordation and at least 30 days prior to demolition, the interested parties would have the opportunity to salvage architectural elements for re-use or curation. Items selected would be removed in a manner that minimizes damage.

The mitigation measures identified above are suggested measures; actual measures will be set forth in the MMRP.

6. PREPARER'S QUALIFICATIONS

JRP partner Meta Bunse (MA in History – Public History, California State University, Sacramento) was the project manager for the preparation of this report. She provided general direction, technical report and EIR summary writing and project direction. Ms. Bunse reviewed and edited the reports, DPR 523 forms, graphics. Ms. Bunse has more than fifteen years experience working as a consulting historian on a wide variety of historical research and cultural resource management projects as a researcher, author, and project manager. Based on her level of education and experience, Ms. Bunse qualifies as historian and architectural historian under the Secretary of the Interior's Professional Qualification Standards (as defined in 36 CFR Part 61). Research Assistant Steven Melvin (B. A., History, University of Minnesota, M. S. in progress, Public History, California State University, Sacramento) also contributed to the research and preparation of the report and DPR 523 forms.

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Mosier, Daniel L. "California Bricks." Available at http://calbricks.netfirms.com/ brickhistory.html. Accessed on September 30, 2005.

National Park Service. National Register Information System online database. Available at http://www.nr.nps.gov/ and http://www.nationalregisterofhistoricplaces.com/CA/state. Accessed October and November 2005.

APPENDIX A:

Figures

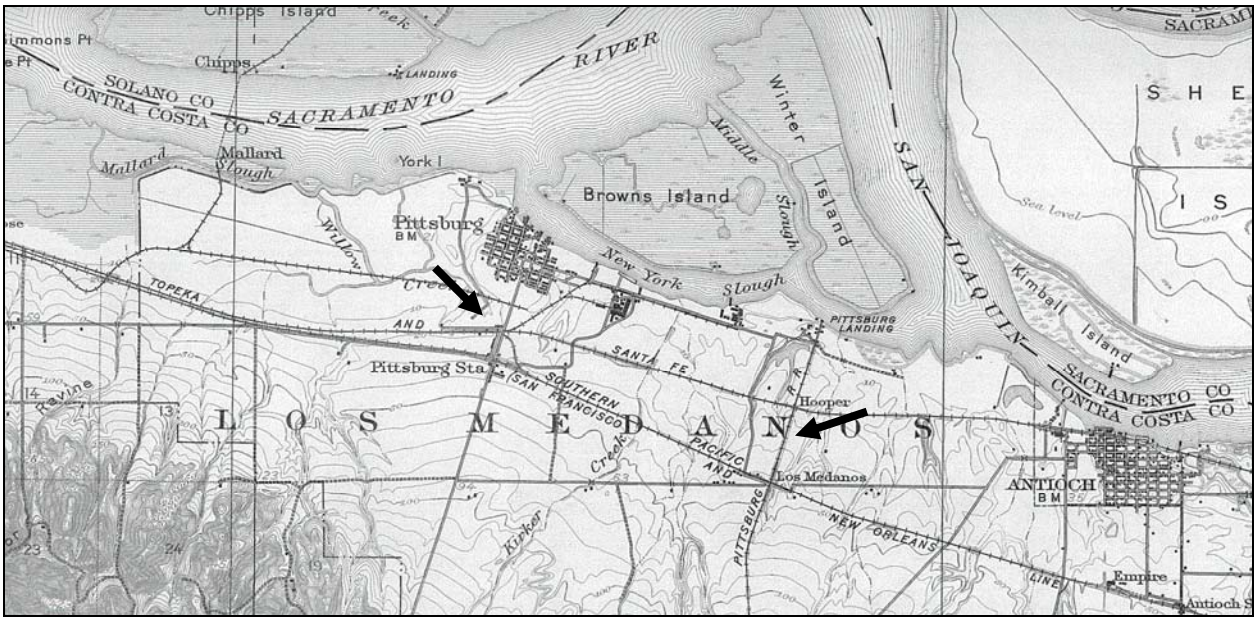


FIGURE A. Pittsburg and vicinity in 1908. Arrows indicate approximate locations of the Standard Oil (right) and W. 10th Street study areas for historic architectural resources.
Source: USGS, *Antioch Quadrangle* (Washington, D.C.: USGS, 1908).

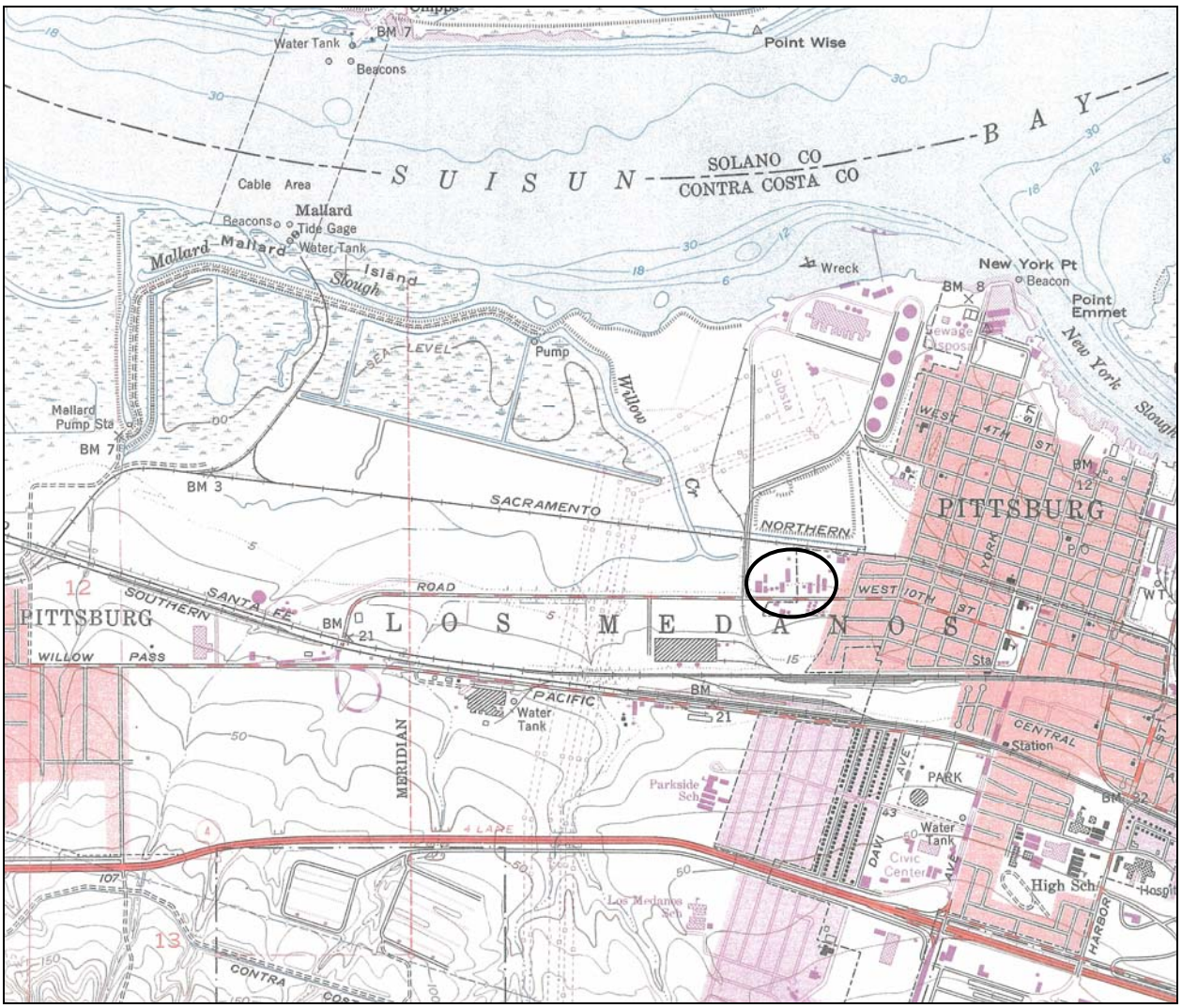


FIGURE B. The vicinity of the W. 10th Street study area as it appeared in 1968.
Source: USGS. *Honker Bay, Calif. 7.5' Quadrangle*. Washington, D.C.: USGS, 1953, photorevised to 1968.

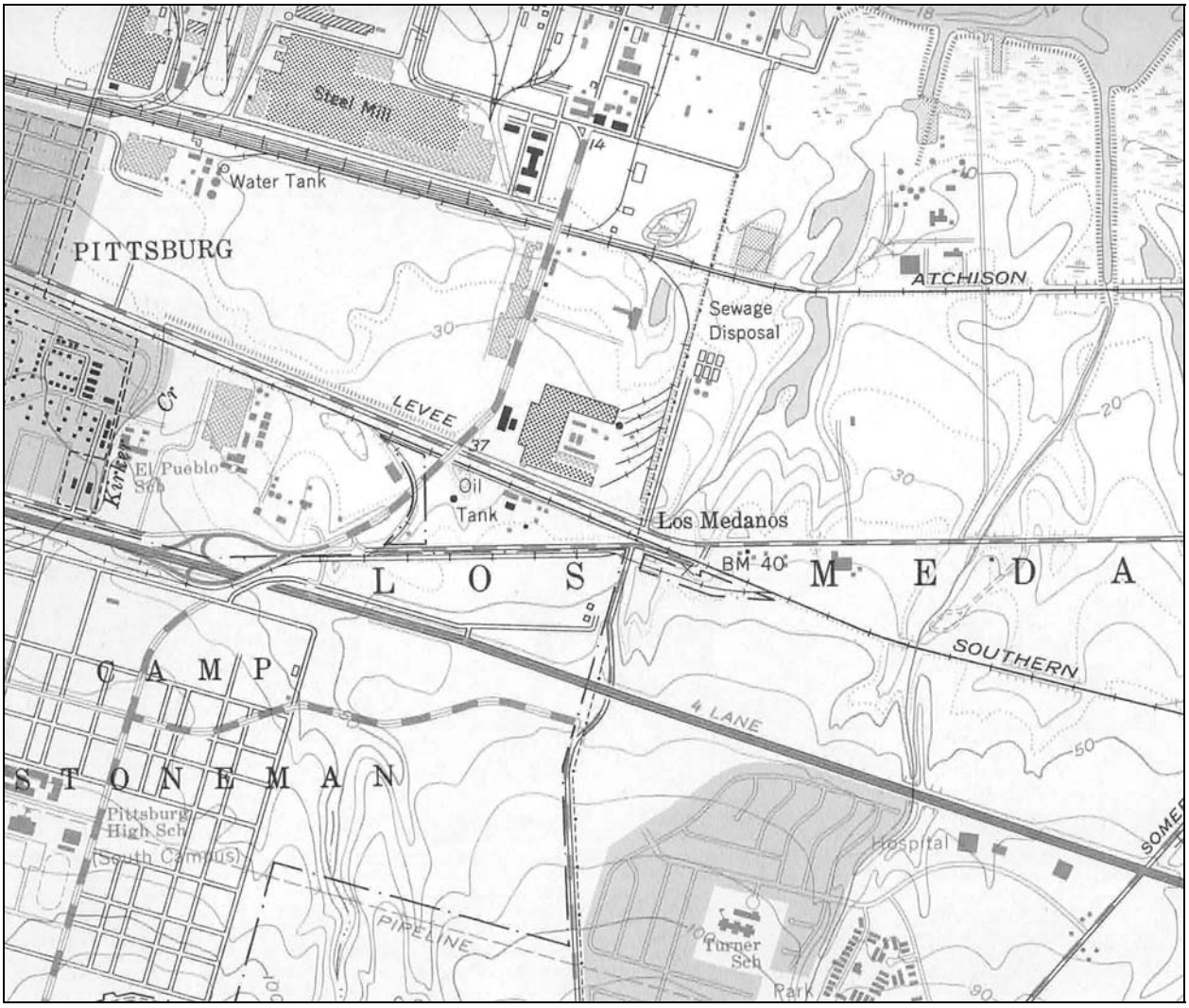


FIGURE C. Vicinity of Standard Oil Site as it appeared in 1968. The site is located between the words "sewage disposal" and "Los Medanos," above.
Source: USGS. *Antioch North Quadrangle*. Washington, D. C.: USGS, 1953, photorevised to 1968.

FIGURE D. Station A, or Potrero Power Plant, 1964. Station A buildings are behind the tank furthest to the right, while the sugar warehouses are across the street to the right.
(San Francisco Historical Photograph Collection, San Francisco Public Library http://sfpl.org/librarylocations/sfhistory/sfphoto.htm)

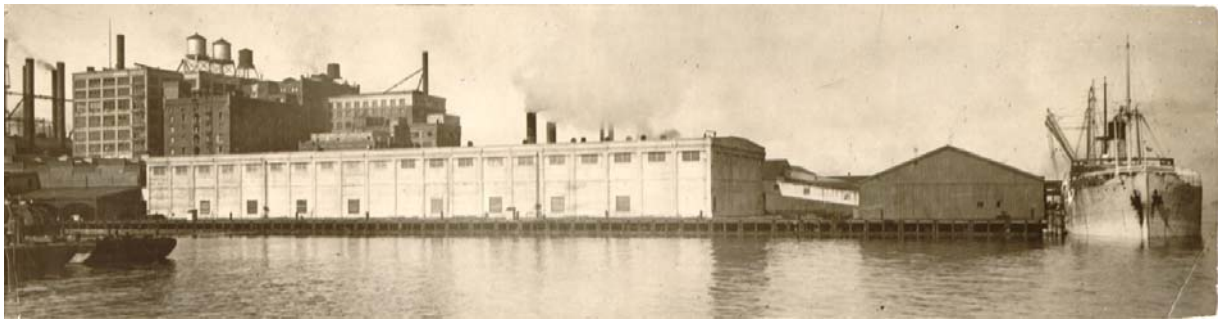


FIGURE E. Western Sugar Refinery in June 1930. The white building is the easternmost warehouse, which was built in 1923.
(San Francisco Historical Photograph Collection, San Francisco Public Library http://sfpl.org/librarylocations/sfhistory/sfphoto.htm**)**

APPENDIX B:

DPR 523 Forms

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

 ***Resource Name -** JRP 5

P1. Other Identifier: No number (north of 560-566) W. 10th Street

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Contra Costa
and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5′ Quad** Honker Bay **Date** 1953 **T** 2N; **R** 1E; __ ¼ **of Sec** ___; ___M.D.M.

c. Address [no number] W. 10th Street City Pittsburg Zip 94565

d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
APN-085-270-042-6

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

There are three buildings on this lot, built immediately adjacent to each other on the south edge of the parcel, which does not front on W. 10th Street and is located north of parcels 22 and 32 on the same block. The building on the west is a single story, rectangular, metal framed shelter with open sides and a gently sloping, shed roof covered in rolled composition (Photograph 1). The other two buildings are east of this shelter. One is a small, single story, rectangular, wood framed, side gabled building. The exterior is comprised of stucco covered wood planks. A double, sliding garage door constructed of vertical planks is centered in the east wall (Photograph 2). Immediately to the north of the eastern building is a single story, rectangular, wood framed storage shed with a low-pitched shed roof. The walls are made of plywood and corrugated steel (Photograph 3).

***P3b. Resource Attributes:** (List attributes and codes) (HP4) Ancillary Buildings
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) West building, view northeast, September 17, 2005

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1947, county records

***P7. Owner and Address:**
Michael and Jan Fernandes
P.O. Box 831
Clayton, CA 94517

***P8. Recorded by:** (Name, affiliation, address)
Meta Bunse / Rand Herbert
JRP Historical Consulting,
1490 Drew Ave, Suite 110,
Davis, CA 95616

***P9. Date Recorded:** September 17, 2005

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** Inventory and Evaluation, Historic Architectural Resources, Trans Bay Cable Project, 2005.
***Attachments:** ☐ None ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record
☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record
☐ Other (list) _____

B1. Historic Name: _____
B2. Common Name: Caldwell Roofing
B3. Original Use: ancillary shelters and shop B4. Present Use: ancillary shelters and shop
***B5. Architectural Style:** utilitarian
***B6. Construction History:** (Construction date, alteration, and date of alterations) 1947; alterations unknown.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** _____ **Original Location:** _____
***B8. Related Features:** _____

B9. Architect: unknown b. Builder: unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

This property does not appear to meet the criteria for listing in the National Register of Historic Places, nor does it appear to be an historic resource for the purposes of CEQA. This parcel is .64 acre in size and is located north of West 10th Street and south of the Burlington Northern Railroad line in Pittsburg. These buildings were built in 1947 and after and have undergone numerous changes and alterations since that time. This part of Pittsburg began to develop during the last years of World War II and soon after as the area began to experience the expansion and growth stimulated by the close of the war. These ancillary buildings have served as storage and supply for various businesses, including an automotive salvage yard and roofing company. (see Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes) _____

***B12. References:** Contra Costa County Property Records; USGS 7.5' *Honker Bay* Topographic Map, 1953, 1980; Polk's Pittsburg-Antioch City Directory, various from 1949-1978; aerial images from Google.com; Maps from Contra Costa County Assessors web site.

B13. Remarks:

***B14. Evaluator:** Meta Bunse

***Date of Evaluation:** November 10, 2005

(This space reserved for official comments.)

B10. Significance (continued):

The property does not have important associations with significant events (Criterion A), nor do the occupants appear to have made significant contributions local, state, or national history (Criterion B). These ancillary structures are associated with the automotive and construction-related businesses that developed on the outskirts of the city after World War II, but they do not have important associations within this context or the general development of Pittsburg. The buildings are utilitarian and unadorned. They do not have distinctive architectural details and are not important examples of a type, period, or method of construction (Criterion C). In rare instances, buildings themselves can serve as sources of important information about historic construction materials or technologies (Criterion D); however, this property is otherwise documented and does not appear to be a principal source of important information in this regard. Furthermore, the buildings have lost integrity through numerous alterations. The buildings have also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code and do not appear to meet the significance criteria as outlined in these guidelines.

P5b. Photographs (continued):

Photograph 2. East building,
Camera facing southwest, September 17, 2005.

Photograph 3. Sheds and extensions north of eastern building,
camera facing west, September 17, 2005.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

 ***Resource Name or #** (Assigned by recorder) JRP 1

P1. Other Identifier: 552 West 10th Street
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County:** Contra Costa
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Honker Bay **Date** 1953 **T** 2N; **R** 1E ; __ ¼ **of Sec** ____; _____ **B.M.**
c. Address 552 West 10th Street City Pittsburg Zip 94565
d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
APN- 085-270-020-2
***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This building is a large Quonset hut with ridge metal panel siding. It has a parapet front wall at the south end that was building in place of the original Quonset wall. This stepped parapet wall is covered in horizontal wood siding on the second story, and stucco on the lower section. The façade is broken by metal sash sliding windows and a recessed doorway; on the east side is an awning covered doorway and additional windows.

***P3b. Resource Attributes:** (List attributes and codes) Industrial (HP 8)
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: View northwest, November 3, 2005.

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1947, county records

***P7. Owner and Address:**
Linda J. Gonzalez Trust
14185 Black Mountain Ct.
Red Bluff, CA 96080

***P8. Recorded by:** (Name, affiliation, address)
Rand Herbert, Steven J. Melvin
JRP Historical Consulting,
1490 Drew Ave, Suite 110,
Davis, CA 95616

***P9. Date Recorded:** November 3, 2005

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** Inventory and Evaluation, Historic Architectural Resources, Trans Bay Cable Project, 2005.)
***Attachments:** ☐ None ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record
☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record
☐ Other (list) _____

B1. Historic Name: Bell Dick Trucking, Pittsburg Ready Mix Concrete, Delta Ready Mix,
B2. Common Name: ALB Contractors
B3. Original Use: light industrial B4. Present Use: light industrial
***B5. Architectural Style:** utilitarian
***B6. Construction History:** 1947

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** _____ **Original Location:**
***B8. Related Features:**

B9. Architect: unknown b. Builder: unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

This property does not appear to meet the criteria for listing in the National Register of Historic Places, nor does it appear to be an historic resource for the purposes of CEQA. This parcel is 1.17 acres and is located on the north side of West 10th Street in Pittsburg. This building was built in 1947. This area on the western outskirts of Pittsburg became more developed during the decades after the close of World War II. This building has housed various businesses, including Bell Dick Trucking, Pittsburg Ready Mix Concrete, and Delta Ready Mix. The current owner has held the property since 1988. (see Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes)

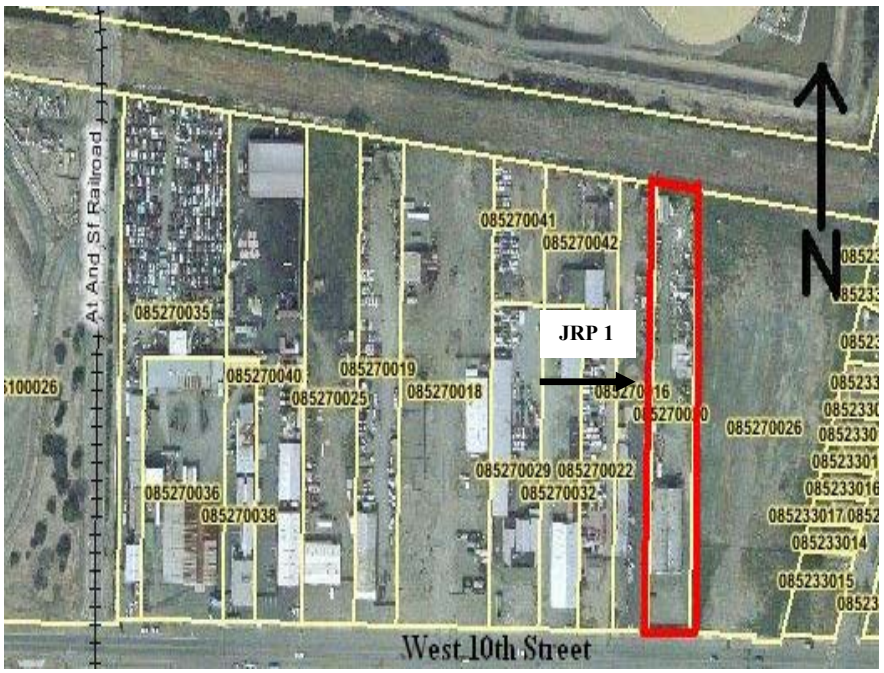
***B12. References:** Contra Costa County Property Records; USGS 7.5' *Honker Bay* Topographic Map, 1953, 1980; Polk's Pittsburg-Antioch City Directory, various from 1949-1978; aerial images from Google.com; Maps from Contra Costa County Assessors web site.

B13. Remarks:

***B14. Evaluator:** Meta Bunse

***Date of Evaluation:** November 3, 2005

(This space reserved for official comments.)



B10. Significance (continued):

The property does not have important associations with significant events (Criterion A), nor do the occupants appear to have made significant contributions local, state, or national history (Criterion B). The building supply businesses that have operated here do not have important associations within the context of the general development of Pittsburg. The building is modest in size and its simplistic prefabricated design does not include distinctive architectural details and it is not an important example of a type, period, or method of construction (Criterion C). In rare instances, buildings themselves can serve as sources of important information about historic construction materials or technologies (Criterion D); however, this property is otherwise documented and does not appear to be a principal source of important information in this regard. The building has also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code and does not appear to meet the significance criteria as outlined in these guidelines.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6
Other Listings _____
Review Code _____ Reviewer _____ Date _____

 ***Resource Name** JRP 2

P1. Other Identifier: 554 W. 10th Street

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Contra Costa
and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5′ Quad** Honker Bay **Date** 1953 **T**2N; **R** 1E; __ ¼ **of Sec** ___; ___M.D.M.

c. Address 554 W. 10th Street City Pittsburg Zip 94565

d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
APN 085-270-016-0

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This is a long, single story, rectangular motel building with a combined office and manger's residence at the south end nearest the street. The motel rooms are located in a long extension extending to the rear (north). The office portion has a moderately pitched, hipped roof with composition shingles, while a flat roof covers the rear portion. Stucco covers the exterior walls that hold sliding aluminum and vinyl frame windows with plain wood trim. A brick skirt wall encircles the office/residence and a small shed roof supported by plain wood posts covers the entrance. A long, wood frame shed awning supported by stuccoed posts shelters the entrances of the guest rooms along the east side of the building. Small replacement vinyl frame sliding windows and exterior mounted air condition units appear at the west side of the guest room portion of the building.

***P3b. Resource Attributes:** (List attributes and codes) (HP5) Motel
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) View northwest, September 17, 2005

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1944, 1954, county property records

***P7. Owner and Address:**
Hitesh D. and Vina H. Patel
559 West 10th Street
Pittsburg, CA 94565

***P8. Recorded by:** (Name, affiliation, address)
Meta Bunse / Rand Herbert
JRP Historical Consulting,
1490 Drew Ave, Suite 110,
Davis, CA 95616

***P9. Date Recorded:** September 17, 2005

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** Inventory and Evaluation, Historic Architectural Resources, Trans Bay Cable Project, 2005.
***Attachments:** ☐ None ☐ Location Map ☐ Sketch Map ☒Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record
☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record
☐ Other (list) _____

B1. Historic Name: Fraylne Motel
B2. Common Name: Budget Inn of Pittsburg
B3. Original Use: Motel B4. Present Use: Motel
***B5. Architectural Style:** Roadside commercial
***B6. Construction History:** (Construction date, alteration, and date of alterations) 1944, recent window replacement and stucco siding.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** _____ **Original Location:** _____
***B8. Related Features:** _____

B9. Architect: unknown b. Builder: unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

This property does not appear to meet the criteria for listing in the National Register of Historic Places, nor does it appear to be an historic resource for the purposes of CEQA. This parcel is .99 acres and is located on the north side of West 10th Street in Pittsburg. This motel building was built in 1944 and county property records indicate that it was altered in 1954. It was known as the Fraylne Motel from the early 1950s to the mid-1970s. The site visit revealed recent work on the building as well, including new roofing, new stucco siding, replaced windows, and new posts on the awning over the guest room entrances. The area had not yet entered the period of expansion and growth that would come at the close of the war, but this motel was in place to take advantage of the trend and could serve travelers from this location at the western outskirts of Pittsburg. Prior sale of the property was in 1999. (see Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes) _____

***B12. References:** Contra Costa County Property Records; USGS 7.5' *Honker Bay* Topographic Map, 1953, 1980; Polk's Pittsburg-Antioch City Directory, various from 1949-1978; aerial images from Google.com; Maps from Contra Costa County Assessors web site.

B13. Remarks:

***B14. Evaluator:** Meta Bunse

***Date of Evaluation:** November 10, 2005

(This space reserved for official comments.)

B10. Significance (continued):

The property does not have important associations with significant events (Criterion A), nor do the occupants appear to have made significant contributions local, state, or national history (Criterion B). This motel is a business that has served the local community and travelers passing through for about 60 years, but it does not have important associations within the context of roadside motels or the general development of Pittsburg. The building is modest in size and simplistic in design without distinctive architectural details and is not an important example of a type, period, or method of construction (Criterion C). In rare instances, buildings themselves can serve as sources of important information about historic construction materials or technologies (Criterion D); however, this property is otherwise documented and does not appear to be a principal source of important information in this regard. Furthermore, the building has lost integrity through numerous alterations. The motel has also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code and does not appear to meet the significance criteria as outlined in these guidelines.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

 ***Resource Name** JRP 3

P1. Other Identifier: 560/562 West 10th Street
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Contra Costa
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Honker Bay **Date** 1953 **T** 2N; **R** 1E; ___ **of Sec** ___; _____ **B.M.**
c. Address 560/562 West 10th Street City Pittsburg Zip 94565
d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
APN 085-270-022-8
***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This is an irregular shaped building with a flat roof. A tile-covered skirt roof projects from all sides creating a wide eave overhang. The façade consists of stucco covered walls, brick pillars and fixed-pane windows with security grills. On the east side is a personnel door and a metal roll-up garage door.

***P3b. Resource Attributes:** (List attributes and codes) Commercial (HP6)
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) View northwest, November 3, 2005

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1947/1953, county records

***P7. Owner and Address:**
David Bustos
2925 El Dorado Way
Antioch, CA 94509

***P8. Recorded by:** (Name, affiliation, address)
Rand Herbert, Steven J. Melvin
JRP Historical Consulting,
1490 Drew Ave, Suite 110,
Davis, CA 95616

***P9. Date Recorded:** November 3, 2005

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** Inventory and Evaluation, Historic Architectural Resources, Trans Bay Cable Project, 2005.
***Attachments:** ☐ None ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record
☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record
☐ Other (list) _____

B1. Historic Name: Lucky's Restaurant, Caldwell Roofing
B2. Common Name:
B3. Original Use: Commercial B4. Present Use: Commercial
***B5. Architectural Style:** Roadside Commercial
***B6. Construction History:** (Construction date, alteration, and date of alterations) 1947

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** _____ **Original Location:**
***B8. Related Features:**

B9. Architect: unknown b. Builder: unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a

This property does not appear to meet the criteria for listing in the National Register of Historic Places, nor does it appear to be an historic resource for the purposes of CEQA. This parcel is .68 acres and is located on the north side of West 10th Street in Pittsburg. This building was built in 1947. This area on the western outskirts of Pittsburg became more developed during the decades after the close of World War II. This building has housed various businesses, including Lucky's Restaurant and Caldwell Roofing. The current owner has held the property since 2000. (see Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:** Contra Costa County Property Records; USGS 7.5' *Honker Bay* Topographic Map, 1953, 1980; Polk's Pittsburg-Antioch City Directory, various from 1949-1978; aerial images from Google.com; Maps from Contra Costa County Assessors web site.

B13. Remarks:

***B14. Evaluator:** Meta Bunse

***Date of Evaluation:** November 3, 2005

(This space reserved for official comments.)

B10. Significance (continued):

The property does not have important associations with significant events (Criterion A), nor do the occupants appear to have made significant contributions local, state, or national history (Criterion B). The businesses that have operated here do not have important associations within the context of the general development of Pittsburg. The building is modest in size; it does not include distinctive architectural details and it is not an important example of a type, period, or method of construction (Criterion C). In rare instances, buildings themselves can serve as sources of important information about historic construction materials or technologies (Criterion D); however, this property is otherwise documented and does not appear to be a principal source of important information in this regard. The building has also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code and does not appear to meet the significance criteria as outlined in these guidelines.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

 ***Resource Name -**JRP 4

P1. Other Identifier: 564 West 10th Street
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Contra Costa
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Honker Bay **Date** 1953 **T**___; **R** ___; __ ¼ **of Sec** ___; _____ **B.M.**
c. Address 564 West 10th Street City Pittsburg Zip 94565
d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
APN- 085-270-032-7
***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This building is rectangular and has a steel frame which supports a medium-pitched, front-gabled, steel panel roof. The walls are steel panel and the façade is a mixture of large, fixed pane windows, vertical groove plywood panels, and board and batten siding. The doorway consists of two steel-frame, solid pane doors hinged on each side. At the corners of the façade are brick columns.

***P3b. Resource Attributes:** (List attributes and codes) (HP8) Industrial
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) View northeast, November 3, 2005

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1959, county records

***P7. Owner and Address:**
John A. McHugh and
Michael and Jan Fernandes
12510 Marsh Creek Road
Clayton, CA 94517

***P8. Recorded by:** (Name, affiliation, address)
Rand Herbert, Steven J. Melvin
JRP Historical Consulting,
1490 Drew Ave, Suite 110,
Davis, CA 95616

***P9. Date Recorded:** November 3, 2005

***P10. Survey Type:** Intensive

***P11. Report Citation:** Inventory and Evaluation, Historic Architectural Resources, Trans Bay Cable Project, 2005.
***Attachments:** ☐ None ☐ Location Map ☐ Sketch Map ☒Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record
☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record
☐ Other (list) _____

Page 2 **of** 3 ***NRHP Status Code** 6Z

***Resource Name –**JRP 4

B1. Historic Name: Crane Brothers Plumbing, Heating, and Sheetmetal
B2. Common Name:
B3. Original Use: light industrial B4. Present Use: vacant
***B5. Architectural Style:** utilitarian
***B6. Construction History:** (Construction date, alteration, and date of alterations) 1959

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** _____ **Original Location:**
***B8. Related Features:**

B9. Architect: unknown b. Builder: unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a

This property does not appear to meet the criteria for listing in the National Register of Historic Places, nor does it appear to be an historic resource for the purposes of CEQA. This parcel is .79 acres and is located on the north side of West 10th Street in Pittsburg. This building was built in 1959. This area on the western outskirts of Pittsburg became more developed during the decades after the close of World War II. This building has housed various businesses, including Crane Brothers Plumbing, Heating, and Sheet Metal. The current owner has held the parcel since 2000; the prior sale was in 1983. (see Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:** Contra Costa County Property Records; USGS 7.5' *Honker Bay* Topographic Map, 1953, 1980; Polk's Pittsburg-Antioch City Directory, various from 1949-1978; aerial images from Google.com; Maps from Contra Costa County Assessors web site.

B13. Remarks:
***B14. Evaluator:** Meta Bunse

***Date of Evaluation:** November 3, 2005

(This space reserved for official comments.)

B10. Significance (continued):

The property does not have important associations with significant events (Criterion A), nor do the occupants appear to have made significant contributions local, state, or national history (Criterion B). The businesses that have operated here do not have important associations within the context of the general development of Pittsburg. The building is modest in size and its simplistic prefabricated design does not include distinctive architectural details and it is not an important example of a type, period, or method of construction (Criterion C). In rare instances, buildings themselves can serve as sources of important information about historic construction materials or technologies (Criterion D); however, this property is otherwise documented and does not appear to be a principal source of important information in this regard. The building has also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code and does not appear to meet the significance criteria as outlined in these guidelines.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

 ***Resource Name –**JRP 6

P1. Other Identifier: 566 West 10th Street

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County:** Contra Costa
and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5′ Quad** Honker Bay **Date** 1953 **T** 2N; **R** 1E; __ ¼ **of Sec** ____; _____ **B.M.**

c. Address 566 West 10th Street City Pittsburg Zip 94565

d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
APN- 085-270-029-3

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This building has an irregular footprint with multiple components of different material, type, size, and age. It is comprised of a centrally located, two-story, front gabled element with composite shingles and steel panel siding. It has a row of 3x3 and 2x3 fixed pane windows just below the eaves (Photograph 2). Flanking this portion to the east and west are single story, front-gabled elements with rolled composite and composite shingle roofing, and primarily steel panel siding with some horizontal wood siding Photograph 3). Extending from the north end is a shed-roof addition with steel panel siding. The front addition to the building has a flat roof which is separated from the gabled section by a parapet with decorative ends. The façade is a combination of vertical groove wood paneling, stucco, and brick with brick columns at the corners. A combination of window types are present including metal sash sliding sets, 1x1 double-hung, and large fixed pane along with two personnel doors. Recessed carports are on the east and west sides.

***P3b. Resource Attributes:** (List attributes and codes) Industrial (HP8)
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) Photograph 1, View northeast, September 17, 2005

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1947, county records

***P7. Owner and Address:**
John A. Mchugh
Michael and Jan Fernandes
12510 Marsh Creek Road
Clayton, CA 94517

***P8. Recorded by:** (Name, affiliation, address)
Rand Herbert, Steven J. Melvin
JRP Historical Consulting,
1490 Drew Ave, Suite 110,
Davis, CA 95616

***P9. Date Recorded:** November 3, 2005
***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** Inventory and Evaluation, Historic Architectural Resources, Trans Bay Cable Project, 2005.
***Attachments:** ☐ None ☐ Location Map ☐ Sketch Map ☒Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record
☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record
☐ Other (list) _____

B1. Historic Name: Crabbe Electric Co., Harbor Craft Boats, Andy's Carpet Service, Crane Brothers Plumbing
B2. Common Name: Crane Plumbing and Heating
B3. Original Use: Commercial B4. Present Use: Commercial
***B5. Architectural Style:** utilitarian
***B6. Construction History:** (Construction date, alteration, and date of alterations) 1947

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** _____ **Original Location:**
***B8. Related Features:**

B9. Architect: unknown b. Builder: unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a

This property does not appear to meet the criteria for listing in the National Register of Historic Places, nor does it appear to be an historic resource for the purposes of CEQA. This parcel is 1.03 acres and is located on the north side of West 10th Street on the western outskirts of Pittsburg. This part of Pittsburg developed in the late 1940s and 1950s as part of the general expansion and growth stimulated by the close of the war. This building was built in 1947, since that time additions have been constructed on the west, east, and south sides. This roadside commercial building has housed several construction supply and service-related businesses, including Crabbe Electric Co., Harbor Craft Boats, Andy's Carpet Service, Crane Brothers Plumbing. The last sale of the property was in 2000, prior to that it was 1983. (see Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:** Contra Costa County Property Records; USGS 7.5' *Honker Bay* Topographic Map, 1953, 1980; Polk's Pittsburg-Antioch City Directory, various from 1949-1978; aerial images from Google.com; Maps from Contra Costa County Assessors web site.

13. Remarks:

***B14. Evaluator:** Meta Bunse

***Date of Evaluation:** November 3, 2005

(This space reserved for official comments.)

B10. Significance (continued):

The property does not have important associations with significant events (Criterion A), nor do the occupants appear to have made significant contributions local, state, or national history (Criterion B). This building is associated with the automotive and construction-related businesses that developed on the outskirts of the city after World War II, but does not have important associations within this context or the general development of Pittsburg. The building is unremarkable and does not have distinctive architectural details. It is not an important example of a type, period, or method of construction (Criterion C). In rare instances, buildings themselves can serve as sources of important information about historic construction materials or technologies (Criterion D); however, this property is otherwise documented and does not appear to be a principal source of important information in this regard. The building has also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code and does not appear to meet the significance criteria as outlined in these guidelines.

Photographs (cont):

Photograph 2. View east showing two-story center element.

Photograph 3. View northeast.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

 ***Resource Name -** JRP 7

P1. Other Identifier: 590 W. 10th Street
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Contra Costa
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Honker Bay **Date** 1953 **T** 2N; **R** 1E; __ ¼ **of Sec** ___; ___M.D.M.
c. Address 590 W. 10th Street City Pittsburg Zip 94565
d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
APN-085-270-019-4
***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

On this parcel is a single story, rectangular building with a medium pitched, front-gabled, corrugated metal roof with a slight eave overhang. A flat roof addition extends across the front (south end) of the building and has a flat, built out awning covering the entrance. The addition houses the main entrance which consists of two anodized aluminum doors at the center of the south façade along with three aluminum, sliding windows covered by security bars. Along the east side are three garage bays with roll-up doors.

***P3b. Resource Attributes:** (List attributes and codes) (HP6) Commercial, 1-3 stories
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) View northwest, September 17, 2005

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1956, county records

***P7. Owner and Address:**
Stephen L. and Rita J. Evans
4735 Crestone Needle Way
Antioch, CA 94531

***P8. Recorded by:** (Name, affiliation, address)
Meta Bunse / Rand Herbert
JRP Historical Consulting,
1490 Drew Ave, Suite 110,
Davis, CA 95616

***P9. Date Recorded:** September 17, 2005

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** Inventory and Evaluation, Historic Architectural Resources, Trans Bay Cable Project, 2005.
***Attachments:** ☐ None ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record
☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record
☐ Other (list) _____

B1. Historic Name: Brandstad-Doherty-Reuland Tire Company, Firestone Stores, Willie's Auto Body
B2. Common Name: East County Towing
B3. Original Use: Commercial B4. Present Use: Commercial
***B5. Architectural Style:** Utilitarian
***B6. Construction History:** (Construction date, alteration, and date of alterations) 1956

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** _____ **Original Location:** _____
***B8. Related Features:** _____

B9. Architect: unknown b. Builder: unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

This property does not appear to meet the criteria for listing in the National Register of Historic Places, nor does it appear to be an historic resource for the purposes of CEQA. This parcel is 1.27 acres and is located on the north side of West 10th Street in Pittsburg. This building was built in 1956. The area had entered a period of expansion and growth at the close of World War II. This building has housed various businesses, including Brandstad-Doherty-Reuland Tire Company, Firestone Stores, and Willie's Auto Body. The current owner has held the property since 1989. (See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes) _____

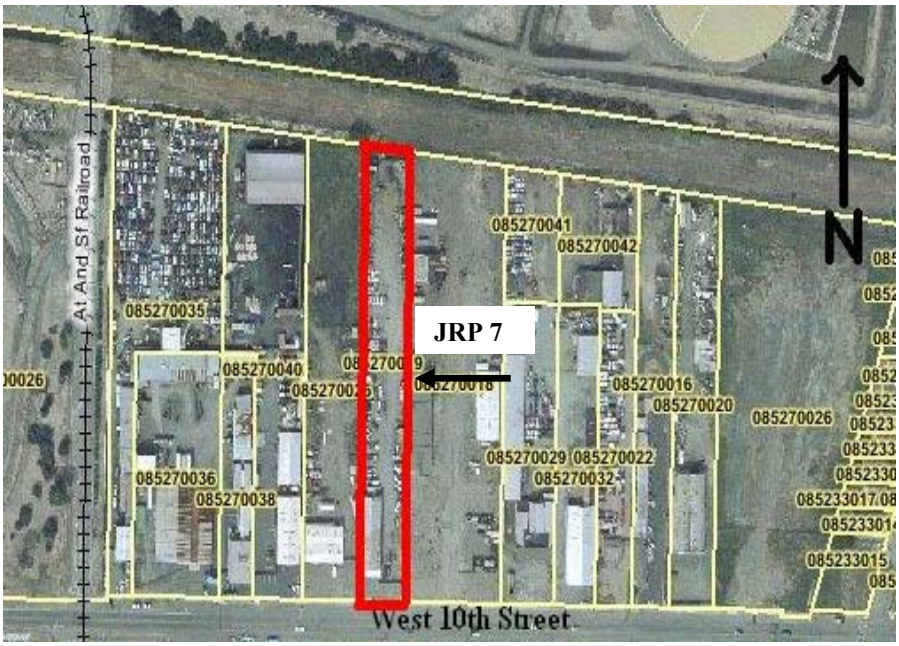
***B12. References:**
Contra Costa County Property Records; USGS 7.5' *Honker Bay* Topographic Map, 1953, 1980; Polk's Pittsburg-Antioch City Directory, various from 1949-1978; aerial images from Google.com; Maps from Contra Costa County Assessors web site.

B13. Remarks:

***B14. Evaluator:** Meta Bunse

***Date of Evaluation:** October 20, 2005

(This space reserved for official comments.)



B10. Significance (continued):

The property does not have important associations with significant events (Criterion A), nor do the occupants appear to have made significant contributions local, state, or national history (Criterion B). This building does not have important associations within the context of the general development of Pittsburg. The building is modest in size and simplistic in design without distinctive architectural details and is not an important example of a type, period, or method of construction (Criterion C). In rare instances, buildings themselves can serve as sources of important information about historic construction materials or technologies (Criterion D); however, this property is otherwise documented and does not appear to be a principal source of important information in this regard. Furthermore, the building has lost integrity through numerous alterations. The building has also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code and does not appear to meet the significance criteria as outlined in these guidelines.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6 _____
Other Listings _____
Review Code _____ Reviewer _____ Date _____

 ***Resource Name –** JRP 8

P1. Other Identifier: 610 W 10th Street
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County:** Contra Costa
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5′ Quad** Honker Bay **Date** 1953 **T** 2N; **R** 1E; __ ¼ **of Sec** ___; ___M.D.M.
c. Address 610 W. 10th Street City Pittsburg Zip 94565
d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
APN-085-270-025-1
***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This single story, building consists of two side-by-side, prefabricated, metal framed buildings, each with a side-gabled roof and very narrow eaves. Both the roof and siding are raised ridge metal. The front entrance is highlighted by a flat roof awning supported by an I-beam frame. A nine-pane, metal frame window is on the east side. The front windows are covered with vertical groove wood paneling.

***P3b. Resource Attributes:** (List attributes and codes) (HP8) Industrial
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) View northwest, September 17, 2005

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1957, county records

***P7. Owner and Address:**
Al Kaplan
2805 Norris Canyon Road
San Ramon, CA 94583

***P8. Recorded by:** (Name, affiliation, address)
Meta Bunse, Steven Melvin
JRP Historical Consulting,
1490 Drew Ave, Suite 110,
Davis, CA 95616

***P9. Date Recorded:** September 30, 2005

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** Inventory and Evaluation, Historic Architectural Resources, Trans Bay Cable Project, 2005.
***Attachments:** ☐ None ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record
☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record
☐ Other (list) _____

B1. Historic Name: Cord Electric Co., Contra Costa County Association for Mentally Retarded
B2. Common Name: _____
B3. Original Use: light industrial B4. Present Use: light industrial
***B5. Architectural Style:** utilitarian
***B6. Construction History:** (Construction date, alteration, and date of alterations) 1957

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** _____ **Original Location:**
***B8. Related Features:**

B9. Architect: unknown b. Builder: unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

This property does not appear to meet the criteria for listing in the National Register of Historic Places, nor does it appear to be an historic resource for the purposes of CEQA. This parcel is 1.61 acres and is located on the north side of West 10th Street in Pittsburg. This building was built in 1957. This area on the western outskirts of Pittsburg became more developed during the decades after the close of World War II. This building has housed various businesses, including Cord Electric Co., and the Contra Costa County Association for Mentally Retarded. The current owner has held the building since 1973. (see Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes) Commercial (HP6)

***B12. References:** Contra Costa County Property Records; USGS 7.5' *Honker Bay* Topographic Map, 1953, 1980; Polk's Pittsburg-Antioch City Directory, various from 1949-1978; aerial images from Google.com; Maps from Contra Costa County Assessors web site.

B13. Remarks:

***B14. Evaluator:** Meta Bunse

***Date of Evaluation:** October 30, 1980

(This space reserved for official comments.)

B10. Significance (continued):

The property does not have important associations with significant events (Criterion A), nor do the occupants appear to have made significant contributions local, state, or national history (Criterion B). The businesses that have operated here do not have important associations within the context of the general development of Pittsburg. The building is modest in size and its simplistic prefabricated design does not include distinctive architectural details and it is not an important example of a type, period, or method of construction (Criterion C). In rare instances, buildings themselves can serve as sources of important information about historic construction materials or technologies (Criterion D); however, this property is otherwise documented and does not appear to be a principal source of important information in this regard. The building has also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code and does not appear to meet the significance criteria as outlined in these guidelines

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # P-07-000806
HRI #
Trinomial CA-CCO-732
NRHP Status Code
Other Listings
Review Code _____ Reviewer _____ Date _____

Page 1 of 3 *Resource Name or #: (Assigned by Recorder) C-Antioch North-1

P1. Other Identifier: Atchison Topeka-Santa Fe Railroad line

*P2. Location: [x] Not for Publication [ ] Unrestricted *a. County Contra Costa County

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad Antioch North Date 1978 T 3N ; R 1E ; ¼ of ¼ of Sec ; MDM B.M.

c. Address Dow Chemical City Pittsburg, CA Zip

d. UTM: (Give more than one for large and/or linear resources) Zone: 10 ; 601,240 mE/ 4,208,390 mN

e. Other Locational Data: (e.g. parcel #, directions to resource, elevation, etc., as appropriate)

*P3a. Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The resource consists of a 400' segment of the Atchison Topeka-Santa Fe Railroad line located approximately one mile east of Pittsburg, CA. There are two sets of standard gauge tracks, one for eastbound trains and one for westbound trains. The tracks cross the Kirker Creek drainage via a wooden trestle. The trestle consists of 5 main supports, and is approximately 45 feet in length. A pproximately 30 feet west of the trestle, a spur of single track branches off to the north. The railroad ballast ranges in height from 4' to 8'. The condition of the track and trestle is good.

*P3b. Resource Attributes: (List attributes and codes) AH7

*P4. Resources present: [ ] Building [ ] Structure [ ] Object [x] Site [ ] District [ ] Element of District [ ] Other (isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, accession #) none

*P6. Date Constructed/Age and Sources: [x] Historic [ ] Prehistoric [ ] Both

*P7. Owner and Address: Burlington-Northern Santa Fe R.R.

*P8. Recorded by: (Name, affiliation, and address) S. Atchley & G. Roark
Jones & Stokes
800 V Street, Sacramento, CA 95818

*P9. Date Recorded: 10/22/99

*P10. Survey Type: (Describe) Pedestrian reconnaissance survey, 20 meter transects.

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Jones & Stokes 1999. Archaeological Survey Report for the Proposed State Route 4 Flood Relief Project, Kirker Creek, City of Pittsburg, Contra Costa County, California.

*Attachments: NONE [x] Location Map [ ] Sketch Map [ ] Continuation Sheet [ ] Building, Structure, and Object Record
[ ] Archaeological Record [ ] District Record [x] Linear Feature Record [ ] Milling Station Record [ ] Rock Art Record
[ ] Artifact Record [ ] Photograph Record [ ] Other (List):

DPR 523A (1/95) *Required Information

AUG - 7 2000

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LINEAR FEATURE RECORD

Primary # P-07-000806
HRI #
Trinomial CA-CCO-732

Page 2 of 3 *Resource Name or #: (Assigned by Recorder) C-Antioch North-1

L1. Historic And/or Common Name: Atchison Topeka-Santa Fe Railroad line

L2a. Portion Described: ☐ Entire Resource ☒ Segment ☐ Point Observation **Designation:**

b. Location of point or segment: (Provide UTM coordinates, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map)
USGS 7.5' Quad Antioch North 1978, T3N, R 1E, Los Medanos Rancho. UTM Zone 10: 601240E/4208390N

L3. Description: (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.)
The resource consists of a 400' segment of the Atchison Topeka-Santa Fe Railroad line located approximately one mile east of Pittsburg, CA. There are two sets of standard gauge tracks, one for eastbound trains and one for west bound trains. The tracks cross the Kirker Creek drainage via a wooden trestle. The trestle consists of 5 main supports, and is approximately 45 feet in length. The tracks are currently in active use by the Burlington Northern Railroad. Approximately 30 feet west of the trestle, a spur of single track branches off to the north. The height of the ballast ranges from 4 feet to 8 feet in height. No artifacts were observed.

L4. Dimensions: (In feet for historic features and meters for prehistoric features)
- **a. Top Width** 45 feet
- **b. Bottom Width** 90 feet
- **c. Height or Depth** 4 feet to 8 feet
- **d. Length of Segment** 400 feet

L5. Associated Resources:
The track is associated with a wooden trestle.

L4e. Sketch of Cross-Section (include scale) **Facing:**

L6. Setting: (Describe natural features, landscape characteristics, slope, etc., as appropriate.)
The track travels across Kirker Creek, a seasonal drainage situated in a level delta area. Nearby vegetation includes cattails, thistles, and introduced grasses.

L7. Integrity Considerations:
The track, ballast, and wooden trestle are in good condition.

L8a. Photograph, Map or Drawing

L8b. Description of Photo, Map, or Drawing (View, scale, etc.)
none

L9. Remarks:

L10. Form Prepared by: (Name, affiliation, and address)
S. Atchley
Jones & Stokes
2600 V Street
Sacramento, CA

L11. Date: 11/8/99

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

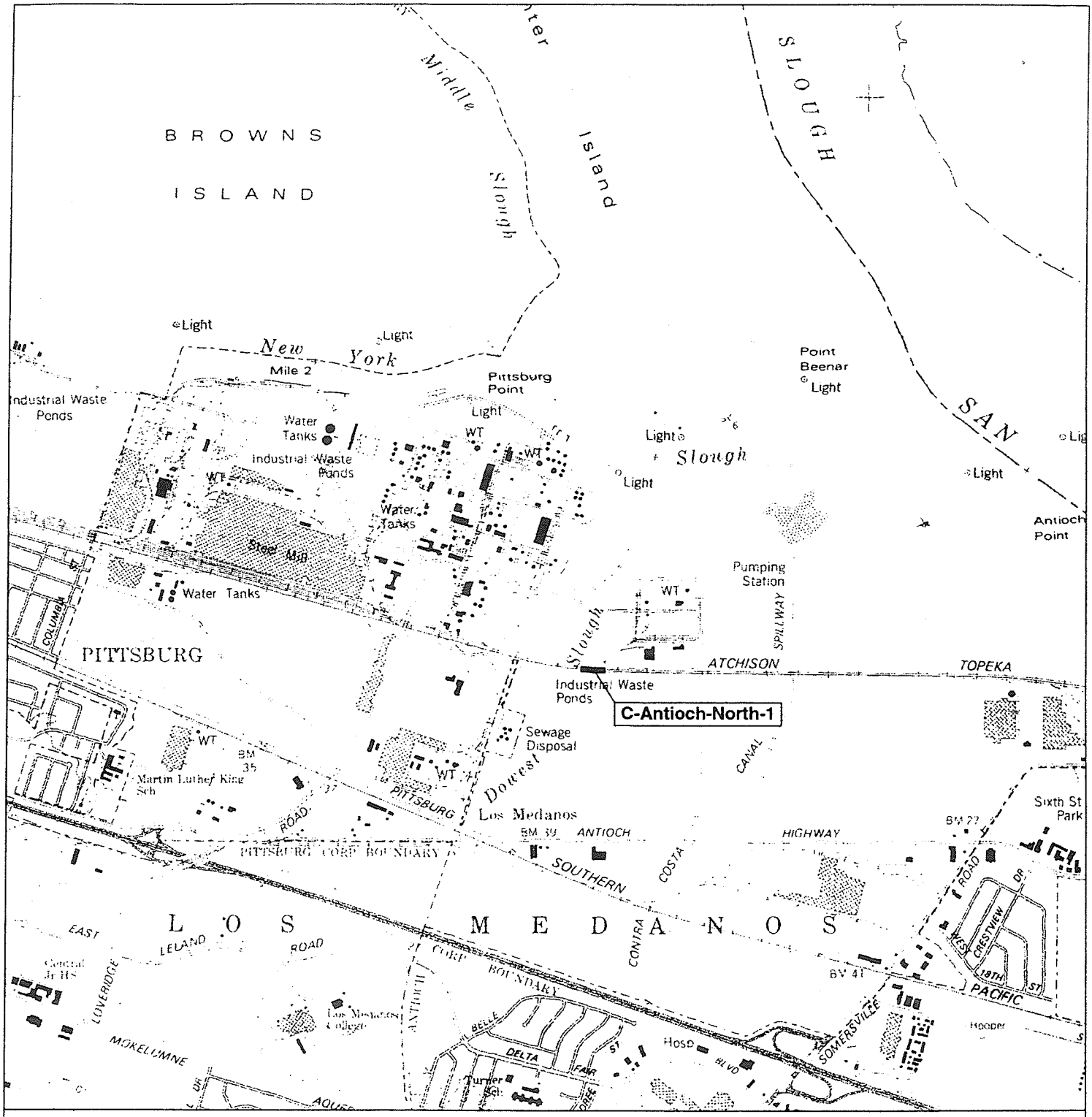
LOCATION MAP

Primary # P-07-000806
HRI #
Trinomial CA-CCO-732

Page ____ of ____

*Resource Name or #: C-Antioch North-1 (Atchison, Topeka, and Santa Fe Railroad)

*Map Name: Antioch North, California *Scale: 1:24,000 (1"=2,000') *Date of Map: 1978



0 1,000 2,000 3,000 4,000 5,000
feet
Scale = 1:24,000
Base map: USGS 7.5'-series Antioch North, California, quadrangle (1978)

16 1/2° TN / mN

DPR 523J (1/95)

*Required information

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # P-07-000827
HRI #
Trinomial
NRHP Status Code
Other Listings
Review Code Reviewer Date

Page 1 of 4 *Resource Name or #: (Assigned by Recorder) 1501 Loveridge Road

P1. Other Identifier: Map Reference # 23

*P2. Location: ☐ Not for Publication ☒ Unrestricted *a. County Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad Antioch North (#4814) Date 1978 T ; R ; ¼ of ¼ of Sec ; B.M.

c. Address City Zip

d. UTM: (Give more than one for large and/or linear resources) Zone: ; mE/ mN

e. Other Locational Data: (e.g. parcel #, directions to resource, elevation, etc., as appropriate)

APN: 073-230-033

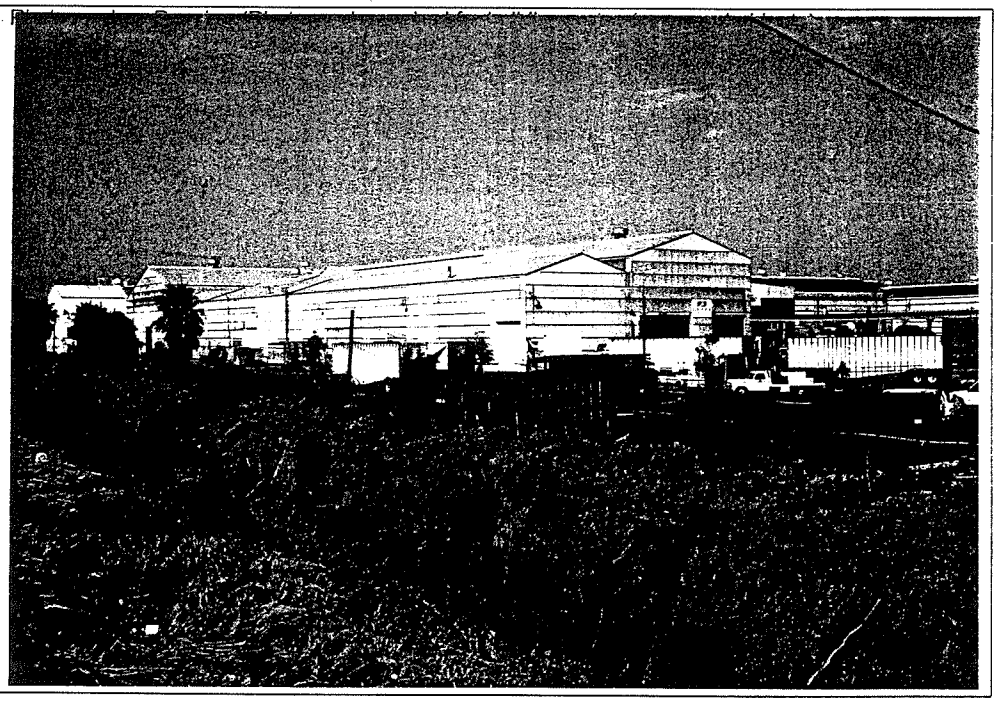
(UTM: 600440mE/4208100mN)
(600640mE/4208040mN)
(600360mE/4207880mN)
(600570mE/4207830mN)

*P3a. Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The building at 1501 Loveridge Road is a large industrial structure made up of several elements, the oldest of which dates back to 1942. The overall plan of the building is generally a "U" in shape, with side wings topped by multiple gabled roofs making up the base and arms of the "U" plan. The base of the "U" is the front of the building that faces Loveridge Road. A two story flat roofed concrete structure with a brick base fronts the building on this side. The main public entrance is found at the center of this element. The brick and concrete structure is designed with slightly recessed walls under a flat cap, and is lined with pilasters flush with the cap at intervals around the building. Industrial windows form a band around each story of the building in between the pilasters. The windows have horizontal panes stacked 2/2 on the ground story and 2/3 on the top story. Much taller in height than this two story front element are the warehouse structures directly behind it. A three gable roofed structure runs parallel to the concrete front. Intertwined at the corners of each side are two more gable roofed structures extending to the rear to create the arms of the "U." These large warehouse structures are predominantly sheathed with large shingles of corrugated metal. Industrial doors and windows are found around them. A modern extension sheathed in ribbed metal extends from the south side.

*P3b. Resource Attributes: (List attributes and codes) HP8 Industrial Building

*P4. Resources present: ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (isolates, etc.)

P5a. 

P5b. Description of Photo: (View, date, accession #) South elevation looking north: 10/6/99

*P6. Date Constructed/Age and Sources: ☒ Historic ☐ Prehistoric ☐ Both
Constructed 1942 (County Assessor Records)

*P7. Owner and Address:
Contra Costa Industrial Park

*P8. Recorded by: (Name, affiliation, and address) Janice Calpo
Jones & Stokes
2600 V Street
Sacramento, CA 95818

*P9. Date Recorded: 10/6/99

*P10. Survey Type: (Describe)
Intensive

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Jones & Stokes Associates, Inc. Historic Architectural Survey Report for the State Route 4 Flood Relief Project – Kirker Creek, Pittsburg, California

*Attachments: NONE ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record
☐ Artifact Record ☐ Photograph Record ☐ Other (List):

DPR 523A (1/95) *Required Information

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
Primary # P-07-000827
HRI #

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRHP Status Code

*Resource Name or # (Assigned by recorder) 1501 Loveridge Road

B1. Historic Name: Columbia-Geneva Steel Company Plant

B2. Common Name:

B3. Original Use: Industrial B4. Present Use: Industrial

*B5. Architectural Style: Minimal Traditional

*B6. Construction History: (Construction date, alterations, and date of alterations)
Constructed 1942

*B7. Moved? [X] No [ ] Yes [ ] Unknown Date: Original Location:

*B8. Related Features:

B9a. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme: Industrial Development Area: Pittsburg

Period of Significance: 1942-1955 Property Type: Industrial Applicable Criteria: N/A

(Discuss imporance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The industrial building at 1501 Loveridge Road is now a part of the Contra Costa County Industrial Park, and is owned by that authority. It sits on land that was once owned by U.S. Steel, the company that constructed the original elements of the building in 1942, likely as a part of the on-going war effort. Prior to acquisition by U.S. Steel, the Columbia-Geneva Steel Company began operations in 1910 on 19 acres of river front property west of Pittsburg. During the initial phases of venture the company employed only sixty men. Production at the facility involved making steel castings for the heavy machinery used in dredges, ships, and in the lumber industry. Each of these types of industry were located in close proximity to the steel plant and thereby provided a localized and steady demand for the company's product. Eventually, Columbia-Geneva became part of the larger United States Steel Company. The new owners expanded the company to cover 1,000 acres of land in Contra Costa County and employed 6,000 people at its peak of operations. (Emanuels 1986: 227). During the 1940s, when this building was added, the 15,000 population of Pittsburg boasted itself as the "Industrial City of the West" (Polk Directory, 1947). The leading industry was the Columbia Geneva Division of the United States Steel Corporation which claimed the largest steel plant on the Pacific Coast, with an employee roll of 3,000 in 1947 (Polk Directory, 1947). Products produced by the plant in Pittsburg ranged from small tacks to castings weighing several tons (Polk Directory, 1957). The building is no longer owned by U.S. Steel and has recently been used in the manufacture of BART cars. (See continuation sheet.)

B11. Additional Resource Attributes: (List attributes and codes)

*B12. References:

See references section of Jones & Stokes Associates, Inc. Historic Architectural Survey Report for the State Route 4 Flood Relief Project – Kirker Creek, Pittsburg, California (See continuation sheets.)

B13. Remarks:

(Sketch Map with north arrow required.)

*B14.Evaluator: Janice C. Calpo, Jones & Stokes Associates, Inc.
2600 V Street Sacramento, CA 95818

*Date of Evaluation: November 18, 1999

(This space reserved for official comments.)

*Required Information

B10. continued:

The building at 1501 Loveridge Road is associated with the Columbia-Geneva Division of the U.S. Steel Company which was established in 1910 and grew to be the largest industry and employer in the City of Pittsburg. The company played a major role in the growth and development of the city. However, this building is not one of the original or more significant of the buildings, and unlike other buildings in the area, does not continue in its original use. Although the building is associated with events important to the history of Pittsburg, it does not date to the early history and is not the best example of that building type. It is not directly associated with persons or events important to the history of Pittsburg, and therefore does not meet the first two criteria for listing in the CRHR or NRHP. Architecturally, it is a common example of an industrial building constructed in the 1940s, but is not an outstanding or only example, and therefore does not meet the third criteria for listing in the CRHR or NRHP. Furthermore, the building has been modified over the years to meet the changing needs of the industry, resulting in a compromise to its original design character. Overall, the industrial building at 1501 Loveridge Road does not appear to meet the criteria for listing in the CRHR or the NRHP.

B12. continued:

Emanuels, George. 1986. *Contra Costa County: an illustrated history*. Panorama West Books. Fresno, CA.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

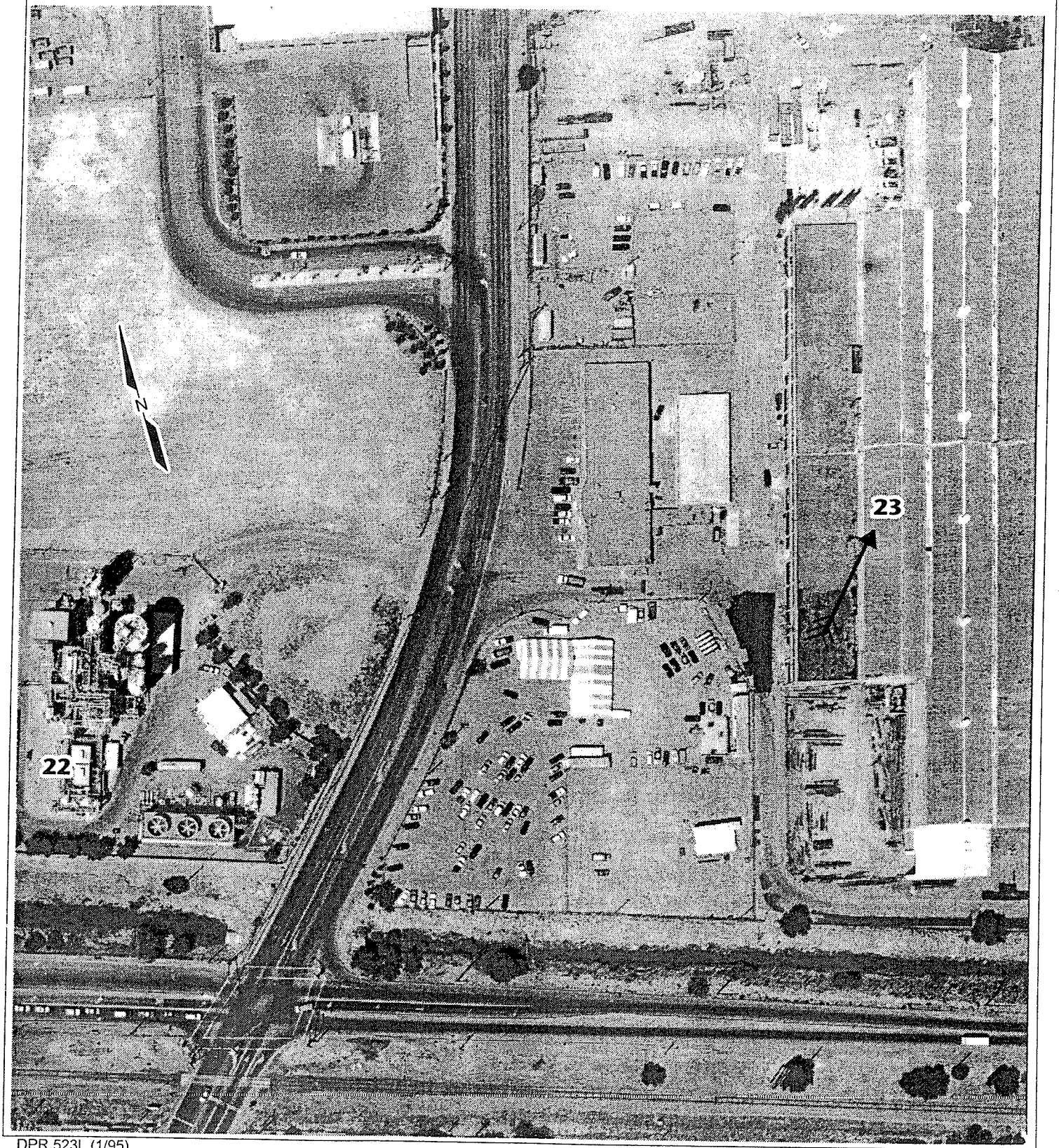
CONTINUATION SHEET

Primary # P-07-000827
HRI #
Trinomial

Page 4 of 4 *Resource Name or # (Assigned by 1501 Loveridge Road

*Recorded by Janice Calpo *Date 10/6/99 [x] Continuation [ ] Update

Sketch Map continued:



*Required information

State of California – The Resource s Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #_____
HRI #_____
Trinomial_____
NRHP Status Code_____

Other Listings
Review Code _____Reviewer _____Date_____

*Resource Name or #: Station A Buildings

P1. Other Identifier: NA
*P2. Location: Not for Publication Unrestricted X *a. County San Francisco
and (P2b and P2c or P2d. Attach a Location Map as necessary)
b. USGS 7.5' Quad San Francisco North Date 1993 T2S ; R5W ; Unsectioned ; B.M. Mt. Diablo
c. Address 1201 Illinois Street City San Francisco Zip 94107
d. UTM: Zone _____;SW/; SE/; NW/ and NE/
e. Other Location Data: (e.g. parcel #, directions to resource, elevation, etc. as appropriate)
This group of five industrial buildings (the Station A Power Plant, the Pump House, the Gate House, the Compressor House and the Meter House) at 1201 Illinois Street are located at the northeast corner of Illinois Street and 23rd Street (APN Block 4174, Lot 3) in the southeast area (Potrero) of the City of San Francisco in the vicinity of San Francisco Bay and Islais Creek. The Station A Power Plant spans the width of the block between 23rd Street and Humboldt Street.

*P3a. Description (Describe the resource and its major elements. Include design, materials, condition, alterations, size, setting & boundaries):
This complex of five industrial buildings - the Station A Power Plant, the Pump House, the Gate House, the Compressor House and the Meter House – located at the northeast corner of Illinois Street and 23rd Street – near the shore of San Francisco Bay. The primarily single-story buildings are on a flat site in an area of industrial and warehouse buildings. All the buildings are brick masonry structures with the exception of the Pump House, a steel frame structure covered with asbestos panels. The largest building in the complex, Station A Power Plant, spans the width of the block (435 feet) between 23rd Street and Humboldt Street.

*P3b. Resource Attributes: HP8
*P4. Resources present: X Building ____Structure____ Object ___ Site X District___ Element of District___ Other

P5a. Photo or Drawing

SEE CONTINUATION SHEET

P5b. Description of Photo:

*P6. Date Constructed/Age and Sources: X Historic ____Prehistoric _____Both 1901- 1930

*P7. Owner and Address
The Southern Company
1201 Illinois Street
San Francisco, CA 94107

*P8. Recorded by: (Name, affiliation, and address) Ward Hill, Architectural Historian, 3124 Octavia Street, San Francisco, CA 94123

*P9. Date Recorded December, 1999

*P10. Survey Type: (Describe)
Intensive

*P11. Report Citation (Cite survey report and other sources, or enter none)
Historic Architecture Report, Station A, Potrero Power Plant

Attachments: ____NONE X Location Map X Sketch Map X Continuation Sheet __ Building, Structure and Object Record___
Archaeological Record X District Record____ Linear Feature Record____ Milling Station Record _____Rock Art Record _____
Artifact Record _____ Photograph Record _____ Other (List)

* Required Information

*Resource Name of # (assigned by recorder) Station A Buildings

D1. Historic Name: Station A D2. Common name: Potrero Power Station

*D3. **Detailed Description** (Discuss overall coherence of the district, its setting, visual characteristics, and minor features. List all elements of district):

This complex of five industrial buildings – the Station A Power Plant, the Pump House, the Gate House, the Compressor House and the Meter House – located at the northeast corner of Illinois Street and 23rd Street is near the shore of San Francisco Bay. The primarily single-story buildings are on a flat site in an area of industrial and warehouse buildings. All the buildings are brick masonry structures with the exception of the Pump House, a steel frame structure covered with asbestos panels. The largest building in the complex, Station A Power Plant, spans the width of the block (435 feet) between 23rd Street and Humboldt Street. The 65-foot-tall Power Plant has a large four-story steel and concrete 1930 addition on its west façade. Adjacent to and west of the Power Plant are the Meter House and the Compressor House, buildings associated with the no-longer-extant gas manufacturing plant that operated at this location. The L-shaped Compressor House, the second largest building in the complex, has Classical architectural details on the exterior like those on the west and south facades of the Power Plant. The Pump House and the Gate House are adjacent to 23rd Street east of the Power Plant. The Gate House also has simple Classical architectural details.

*D4. **Boundary Description** (Describe limits of district and attach map showing boundary and district elements):

The boundaries of the district are approximately the Power Plant/Gate House on the east (the Pump House is sited about 150 feet east of the Power Plant), Humboldt Street on the north, Illinois Street on the west and 23rd Street on the south.

*D5. **Boundary Justification:**

The buildings within the district boundaries are the only extant buildings at the Potrero Power Plant over 50 years old. The area east of the Station A Power Plant was purchased by PG&E in the 1950s. The area north of Humboldt Street has been redeveloped with new buildings in recent years.

*D6. **Significance: Theme** Public Utility Development **Area** California
Period of Significance 1901-1949 **Applicable Criteria** 1 (Discuss district's importance in terms of its historical context as defined by theme, period of significance, and geographic scope. Also address the integrity of the district.)

Competition to provide both gas and electric service was intense in San Francisco even after the largest gas electric companies had merged in 1896 to form the San Francisco Gas and Electric Company. During the turn-of-the-century period as many as eight different electrical systems and four different gas systems were competing for business and residential customers in San Francisco (Coleman 1952: 84-87). One of these competitors was the Independent power system, owned by Claus Spreckels and his sons. The Spreckels companies included the Independent Electric Light and Power Company and the Independent Gas and Power Company. No doubt Spreckels and his sons' first goal in founding these companies was to make a profit, but another reason apparently also entered into the equation.

*D7. **References:**

(see continuation sheet)

*D8. **Evaluator:** Ward Hill, Architectural Historian **Date:** December, 1999
Affiliation and address: 3124 Octavia Street, San Francisco, CA 94123

Item P3a. continued:

The 65-foot-tall Power Plant has a large four-story steel and concrete 1930 addition on its west façade. Adjacent to and west of the Power Plant are the Meter House and the Compressor House, buildings associated with the no-longer-extant gas manufacturing plant that operated at this location. The L-shaped Compressor House, the second largest building in the complex, has Classical architectural details on the exterior like those on the west and south facades of the Power Plant. The Pump House and the Gate House are adjacent to 23rd Street east of the Power Plant.

Item D3. continued:

The coal fired boilers at the San Francisco Gas and Electric's Jessie Street and Stevenson Street steam electric generating plants produced considerable smoke near Claus Spreckels' office building on Market Street. Spreckels complained to the directors of San Francisco Gas and Electric, including the company President Joseph B. Crockett, that the smoke was damaging his building and harming his tenants. Spreckels reportedly confronted Crockett at the elite Pacific Union Club in late 1898 or early 1899, pointedly asking him: " Mr. Crockett, what are you going to do about that smoke from your powerhouses? The soot is blackening the walls of my building and filling my tenants' offices. It's a confound nuisance." Crockett was a known as a "super-club man" and refused to discuss the issue at the club, responding something like the following: "Sir, I make it a rule never to discuss business at the club. If you will take the matter up with me at my office, I shall be most happy to consider it." (Coleman 1952: 85-86). Apparently angry, Spreckels reportedly terminated the conversation, hurried back to his office and in two hours had started engineer A. M. Hunt working on plans for a new state-of-the-art electric plant to compete with San Francisco Gas and Electric (Coleman 1952: 86; Anonymous 1901:269).

The place chosen for the new plant was the Potrero district, long the location for large-scale industrial facilities. Spreckels apparently wanted the new plant close to his sugar refinery, so it was built immediately to the west on the site formerly occupied by the California Barrel Company. Completed and in operation by late 1901, this mammoth steam electric facility took up the length of an entire block, from 22nd Street (formerly Nevada Street) to Humboldt Street between Louisiana and Georgia streets (see Map 3 for a map of the plant in 1914). The December, 1901 issue of *The Journal of Electricity, Power and Gas* reported at length and in glowing terms about the new plant:

> When it was announced that the Independent Electric Light and Power Company proposed to build a giant steam plant in San Francisco, and that its engineering design and installation was to be under the sole management of Mr. A.M. Hunt, it was instantly granted that the station would be second to none in America in the absolute perfection of its steam engineering details. The completion of the plant has amply justified these predictions...it is fully representative of the latest and best American ideas in modern steam station practice. (page 269)

The original main building consisted of two long (433 feet 7 inches) contiguous spaces separated by a common longitudinal wall. The boilers were originally in the eastern half of the building and the steam engines, generators and switchboard equipment in the western half (Fowler 1923: 260). The facility's boilers were powered by California fuel oil, and the prime movers were described as follows in the December 1901 article:

> The steam units, which were built by McIntosh, Seymour and Company of Auburn, N.Y., consist of four main engines of the cross compound vertical type with overhung cranks; the fly-wheel and the generator being between the engine frames, and two smaller units of the tandem compound vertical type for driving the exciters. These engines are now in full operation and another large unit is now in the course of erection. (page 273)

The original electrical equipment was described as follows:

> The electrical equipment of the entire system is, with a few minor exceptions, of the manufacture of the Westinghouse Electric Manufacturing Company, and the installation may be accepted as representative of the most recent ideas relative to large urban steam station practice. The conditions of electric lighting and power service existing in San Francisco...The prospective growth of the city, its scattered industrial centers, the locations of large blocks of power at widely separated points, and the ever growing probability that the steam station would be ultimately operated in conjunction with electric transmission service...all these features and many others afforded

> no escape from the conclusion that the polyphase system of power generation, transmission and distribution was the one best suited for the service. (pages 275-276)

Therefore it was clear to observers at the time of its construction the new station was eventually going to be a part of a larger system of electrical generation, transmission and distribution and that the polyphase, alternating-current system (also called the "universal" system) pioneered by the Westinghouse Company and allied inventors like Nikola Tesla would be supreme in the developing system (Hughes 1983: 111-135).

Mergers 1903 - 1905

The new electric plant, along with the Independent gas plant established at about the same time, attracted their share of customers, putting pressure on the San Francisco Gas and Electric Company. The directors of the latter company tried and failed to purchase the still developing plants from Spreckels as early as 1901. It was only following the resignation of Joseph B. Crockett and a drastic overhauling of the San Francisco Gas and Electric's board of directors (five new members were added), that the company was successful in purchasing the Spreckels properties in 1903. Spreckels did well; he reportedly made a profit of over $1.2 million on the deal and Crockett was ousted. Spreckels no doubt felt this adequate recompense for Crockett's slight and the smoke which had bothered his tenants (Coleman 1952: 88-90). Now the large and modern Potrero steam electric plant was part of the San Francisco Gas and Electric Company.

Following the 1903 consolidation there were two main gas and electric combines in Northern and Central California. The first of these was the California Gas and Electric Company, whose strength was hydroelectric generation and transmission and whose weaknesses were a lack of steam operated power sources and urban markets. The second was the San Francisco Gas and Electric Company, whose weakness was a lack of inexpensive hydroelectric power and whose strengths were gas service, steam operated power sources and access to the great San Francisco market. It was logical for the leaders of these two big corporations to discuss merging to strengthen each other. In October, 1905 Pacific Gas and Electric Company (PG&E) was created (Coleman 1952: 228-229). This consolidation brought the Potrero steam plant, soon known as Station A, into the company which would operate it for the next 70 years.

The Operation of Station A

With an immense but sometimes uncertain supply of relatively inexpensive hydroelectric power available, PG&E's early practice was to use hydroelectric energy for its base load and steam electric plant power to complement the hydroelectric power sources by carrying peak loads when demand jumped. Droughts and winter freezes could also create circumstances under which the steam electric plants would be used more. Since Station A was the biggest steam plant in the PG&E system, it played a key role in this complementary relationship between hydroelectric and steam power. Due to its central role, its equipment was frequently upgraded and productive capacity expanded. During the Spreckels years, the plant had a 8,000 kilovolt - amperes (kva.) capacity and this was increased to 18,000 kva. when the San Francisco Gas and Electric Company took over the plant in 1903 (Fowler 1923: 259-260). In 1910 the process of replacing the old reciprocating engines by more modern turbo-generators began. With three large new turbo-generators in place, capacity jumped to 42,000 kva. by fall 1913. From 1903 until late 1913 Station A was the largest steam plant west of the Rocky Mountains (Federal Power Commission 1935, 1941). The capacity of the Long Beach steam plant of Southern California Edison (put into operation in August 1911), surpassed Station A's in March 1914 after a huge expansion to serve the rapidly growing Los Angeles market (Fowler 1923: 262, 672, 676-681).

A 1915 report described how Station A operated:

> The San Francisco plant operates continuously and is of sufficient size to carry the entire San Francisco load. It is normally operated in parallel with the transmission system and a certain number of boilers are kept standing by ready to pick up the amount of load received in San Francisco from the transmission system...In case of trouble on the transmission system the entire city load would be immediately thrown on the steam station, which means that during the day the load may jump instantaneously from approximately 14,000 to 26,000 kilowatts, and during the evening peak the load may jump from 34,000 to 42,000 kilowatts. It is, therefore, essential to keep enough boilers with steam up and cut-in on the line, to instantly pick up this additional load (Delany 1915: 497-498).

By this point in time the full integration of a regional system of power generation, transmission and distribution was complete. PG&E owned and operated the largest such system on the Pacific Coast and ranked among America's largest utilities, with 36 percent of the electric and gas business of California (Hughes 1983: 278). Station A was one of the centerpieces of this integrated system.

Manufactured Gas and Natural Gas

Before natural gas was available, utility companies manufactured gas from oil or coal. The City Gas Company founded the first gas plant in the Potrero area in 1872. San Francisco Gas and Electric took over this plant in 1897. After the 1906 merger, PG&E took over the San Francisco Gas and Electric Potrero gas manufacturing facility. The Potrero gas plant was primarily on the parcel north of the Station A power plant. The 1906 earthquake and fire destroyed all the gas plants in San Francisco, except the Potrero plant and the Beach Street plant in Marina. Since it survived with minor damage, the Potrero plant was expanded during the years after 1906 as the city rebuilt. PG&E built the Meter House for the gas plant in about 1913-1914 in response to the increase demand for gas. This building is shown as a Meter House on the 1915 Sanborn Fire Insurance Map. Built in 1924 adjacent to the Meter House, the Compressor House stored the compressors that maintained pressure in the gas lines.

Since manufactured gas was quite expensive, it was used primarily for cooking and industrial uses, and not for home heating. In the early twentieth century, coal or wood was still primarily used for home heating. PG&E was not able to provide natural gas in the Bay Area until 1929 because the lack of an economical local source. The discovery of large natural gas reserves in Southern California and the development of large steel pipe to transport the gas led to the construction of a system of gas pipelines from Southern California to the Bay Area in 1929. PG&E revamped their entire gas system to supply inexpensive natural gas to Bay Area households and businesses. After 1929, PG&E retained only four full-time gas plants, primarily in more remote rural areas. Of 21 gas plants operating in 1929, the rest were either immediately retired (8) or utilized for standby service (9) (Coleman 1952:303-304). The Potrero gas plant remained on standby service until 1960, then was later demolished. As the sources of natural gas have expanded in California since 1960, natural gas has completely replaced manufactured gas in the PG&E system.
The Potrero Meter House and Compressor House continued to be used as part of the natural gas distribution system. These buildings were apparently used for storage after PG&E moved its gas distribution to Shotwell Street in San Francisco.

1930 Reconstruction of Station A

The arrival of natural gas brought a big change in the operation of Station A in 1930. The availability of inexpensive natural gas allowed steam power to become relatively more important than hydroelectric power. The most favorable sites for the latter form of power had already been developed, and the droughts of the 1920s had cut down on hydroelectric generation. The result was an increase in steam plant expansions, including Station A. As *Electrical West* reported:

> Two features stand out prominently in connection with two of the three major steam-electric developments now well underway on the Pacific Coast. One of these is the addition of the second 100,000-kva. single-unit steam generator at the Long Beach No. 3 plant of the Southern California Edison Company, bringing the capacity of that plant up to 200,000 kva. and the capacity of the Long Beach group of plants up to more than 400,000 kva. The second noteworthy factor is the high-pressure plant that the Pacific Gas and Electric Company is making out of its station "A" in San Francisco where the two new 50,000-kw. units are to operate on 1,200-lb. steam. Thus the rebuilt plant will be the highest pressure plant on the Pacific Coast, and one of the highest pressure commercial steam-electric generating plants in the entire country (Anonymous 1930: 68).

In 1930, the west and south facades of Station A were rebuilt with a new classical Renaissance designed brick façade. The PG&E engineering department designed the $ 7,000,000 remodeling of Station A. Reportedly, as many as 500 men worked on the reconstruction. The reconstruction included a four-story, steel and concrete addition to the west side of the original building, a huge addition housing boiler room ventilation equipment, and extensive interior alterations to accommodate new equipment in the boiler and turbine rooms. By the early 1940s Station A had been expanded to 130,000 kw. capacity, second in size west of the Rocky Mountains only to the Long Beach plant (Railroad Commission of the State of California 1944; Federal Power Commission 1941).

Steam Power Plants after World War II

In the 1950s, revolutionary advances in the design of steam power plants lead to the production of electrical power with greater efficiency. The new steam plant design was semi-outdoor architecture without an enclosed building for the turbine generator units. The large addition to Hunters Point Plant was designed in the new open design. The 1954 Pittsburg, California outdoor type plant produced 600,000, the largest output in California. Modern steam plants were also built in Antioch and Moss Landing in the 1950s.

Once the old California Sugar Refinery property was shut down and dismantled during the early 1950s, the area to the east of Station A was used for the expansion of steam electric operations (Anonymous, 1950: 22; Sanborn Map Company 1975). A new steam plant (known as Unit 3) was constructed on what was the refinery property in 1965 . Three distillate- fueled units were added near Unit 3 in 1976. The new steam plant has a considerably larger and more efficient boiler. The plant open design cools the boilers more efficiently. Station A continued to operate with Unit 3 until 1983, when it was removed from service.

The outdated turbines were removed and the boiler room was demolished (the boilers were salvaged) (Key 1999). PG&E had electrical distributors operating in the Station A switch room until the late 1980s. The plant has been vacant since the late 1980s. After operating the Potrero Power Plant for over 90 years, PG&E sold the plant to the Southern Company in 1998.

Evaluation

The Power Plant and related Buildings

Station A and the adjacent four buildings have not been previously evaluated for National or California Register eligibility. The Gate House and the Pump House are buildings related to the operation of the power plant. Station A provided most of the electrical power for the City of San Francisco from 1901 to 1915, and the plant was widely recognized as one of the largest steam generated power plants in the Western United States. The extensive remodeling of the plant in 1930 further established its importance in providing electrical power in Northern California. The plant consequently appears to be significant at a local level under California Register Criterion 1 because of its importance in the history of the electrical power industry, with a period of significance from 1901 to 1949.

Although the plant appears significant under California Register Criterion 1, its historic integrity was severely compromised when the boiler room and the adjacent shops were demolished. The boiler room played an essential role in the process of producing electricity at the plant, thus it was a significant part of defining the historic use of the building. Given its huge size (63 by 434 feet) and the significant equipment it housed, the boiler room was a significant "character-defining" feature of the building's original design. The long rectangular shaped boiler and turbine rooms (plus the small office on the west) comprised the original 1901 plant, historically the most significant section of the building. The 1983 demolition of the boiler room removed over 50 percent of the original historic plant. Today, the only extant exterior walls of 1901 plant are the north wall of the turbine room and part of the west façade. The other exterior walls have been either demolished or were extensively remodeled in 1930. The 1930 alterations do not appear to have diminished the plant's integrity since they are over 50 years old and now appear to be significant as part of the plant's growth and evolution. However, the loss of the boiler room has particularly compromised the plant's integrity of design, materials, feeling and association. If the boiler room were extant today, the plant would appear to be eligible for the California Register.

If the plant retained a higher level of integrity, it would have also appeared to be eligible under California Register Criterion C as a major example of an early twentieth century stream powered electrical plant in Northern California. The surviving plant, which primarily dates from the 1930 remodeling, does not appear to be architecturally significant or significant in the history of building technology. Although potentially significant because of its association with Claus Spreckels, Station A does not appear to have strong associations with Spreckels because of the brief period of his ownership of the plant and the many alterations to the plant subsequent to his ownership. Consequently, the Station A does not appear to be eligible under California Register Criterion B.

The Gate House is a small, brick masonry office originally attached at the southeast corner of Station A's boiler room. When the boiler room was demolished, the Gate House became a freestanding structure. The Pump House housed equipment for pumping water to the power plant. These buildings do not appear to be individually significant under California Register Criteria 1, 2 or 3, and thus do not appear to be eligible for the California Register.

The Meter House and Compressor House

The Meter House and Compressor House were part of the complex of gas manufacturing buildings north of Station A. The large gas plant and related buildings were demolished by the 1960s. The gas storage tanks have been removed in more recent years after the gas distribution operation moved. From 1850 to 1930, Northern California depended entirely on manufactured gas for its gas supply. Consequently, manufactured gas played a critical role in the region's development for eighty years. As the supply of cleaner and less expensive natural gas increased after 1930, the plants for manufacturing gas were eventually eliminated.

The Meter House and Compressor House appear to be individually significant under California Register Criterion 1 because they are likely the only extant buildings remaining in the PG&E system associated with the pre-1930 gas manufacturing period. Both buildings retain a very high level of historic integrity. The only modern alterations to the two buildings are roll-up metal doors. In conclusion, the Meter House and the Compressor House appear to be eligible for the California Register under California Register Criterion 1 at a local level of significance. The period of significance for the Meter House is 1914-1930 and 1924-1930 for the Compressor House. The Meter House and the Compressor House do not appear to be exceptional examples of early twentieth century San Francisco industrial architecture, thus they do not appear to eligible under California Register Criterion 3.

***D7. References continued:**

Anonymous
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State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #_____
HRI #_____
Trinomial_____

Page 9 of 10 *Resource Name of # (assigned by recorder) Station A Buildings

*Drawn By U.S.G.S. San Francisco North Quad *Date: December, 1999

DPR 523L (1/95)

* Required Information

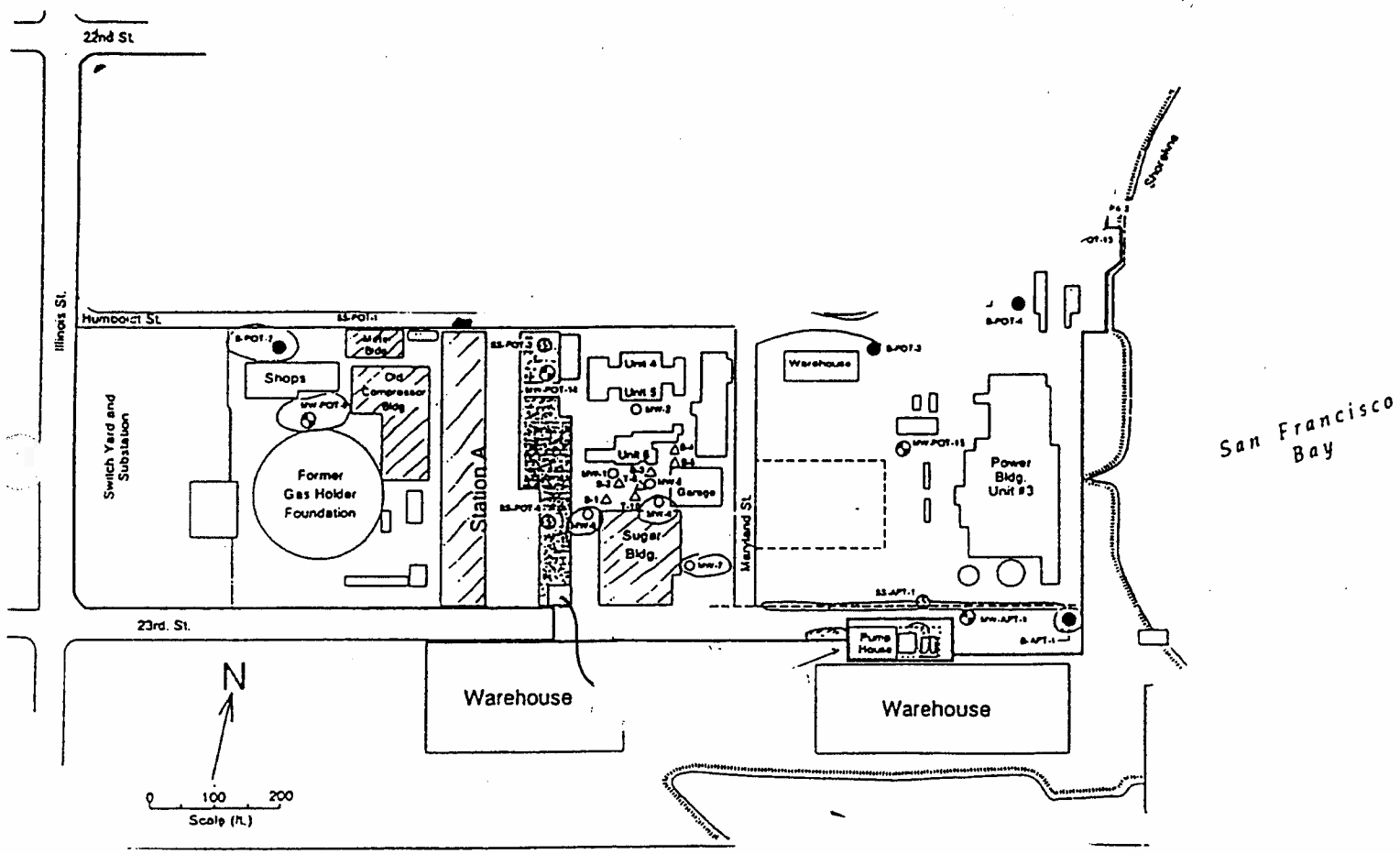
State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

SKETCH MAP

Primary #_____
HRI #_____
Trinomial_____

Page 10 of 10 *Resource Name of # (assigned by recorder) Station A Buildings

*Drawn By NA *Date: December, 1999



DPR 523L (1/95)

* Required Information

State of California – The Resource s Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #_____
HRI #_____
Trinomial_____
NRHP Status Code_____

Other Listings
Review Code _____Reviewer _____Date_____

Page 1 of 3 *Resource Name or #: Pump House, Station A

P1. Other Identifier: NA
*P2. Location: Not for Publication Unrestricted X *a. County San Francisco
and (P2b and P2c or P2d. Attach a Location Map as necessary)
b. USGS 7.5' Quad San Francisco South Date _____ T ; R ; Unsectioned ; B.M.
c. Address 1201 Illinois Street City San Francisco Zip 94107
d. UTM: Zone _____;SW/; SE/; NW/ and NE/
e. Other Location Data: (e.g. parcel #, directions to resource, elevation, etc. as appropriate)
The Pump House is part of a group of five industrial buildings at 1201 Illinois Street is located at the northeast corner of Illinois Street and 23rd Street (APN Block 4174, Lot 3) in the southeast area (Potrero) of the City of San Francisco in the vicinity of San Francisco Bay and Islais Creek. The Pump House is near 23rd Street, 200 feet east of the Station A power plant.

*P3a. Description (Describe the resource and its major elements. Include design, materials, condition, alterations, size, setting & boundaries):

The Pump House is a rectangular plan, steel frame structure covered with corrugated asbestos transite (according to a 1932 P.G. & E. construction report) (Photo 1). The building has a deep concrete foundation. The main shed roof steps down to lower shed roof (covered with asphalt roofing paper) on the south façade. The west façade has a roll-up metal door and an adjacent single hinged door. A metal stairs leads down from this door into the Pump House interior (Photo 2). The interior space combines an area below grade with perimeter concrete walls below the main structure above. Four steel columns run through the center of the interior.

*P3b. Resource Attributes: HP8
*P4. Resources present: X Building ____Structure____ Object ___ Site ___District___ Element of District___ Other

P5a. Photo or Drawing

SEE CONTINUATION SHEET

P5b. Description of Photo:

*P6. Date Constructed/Age and Sources: X Historic ____Prehistoric _____Both 1930

*P7. Owner and Address
The Southern Company
1201 Illinois Street
San Francisco, CA 94107

*P8. Recorded by: (Name, affiliation, and address) Ward Hill, Architectural Historian, 3124 Octavia Street, San Francisco, CA 94123

*P9. Date Recorded December, 1999

*P10. Survey Type: (Describe)
Intensive

*P11. Report Citation (Cite survey report and other sources, or enter none)
Historic Architecture Report, Station A, Potrero Power Plant

Attachments: ____NONE__ Location Map ___Sketch Map X Continuation Sheet __ Building, Structure and Object Record___
Archaeological Record ___ District Record____ Linear Feature Record____ Milling Station Record _____Rock Art Record _____
Artifact Record _____ Photograph Record _____ Other (List)

**PHOTO 1: Pump House, Station A
(view from northeast)**

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary #_____
HRI #_____
Trinomial_____

Page 3 of 3 *Resource Name or # (assigned by recorder) Pump House, Station A

*Recorded by Ward Hill *Date: December, 1999 X Continuation __Update

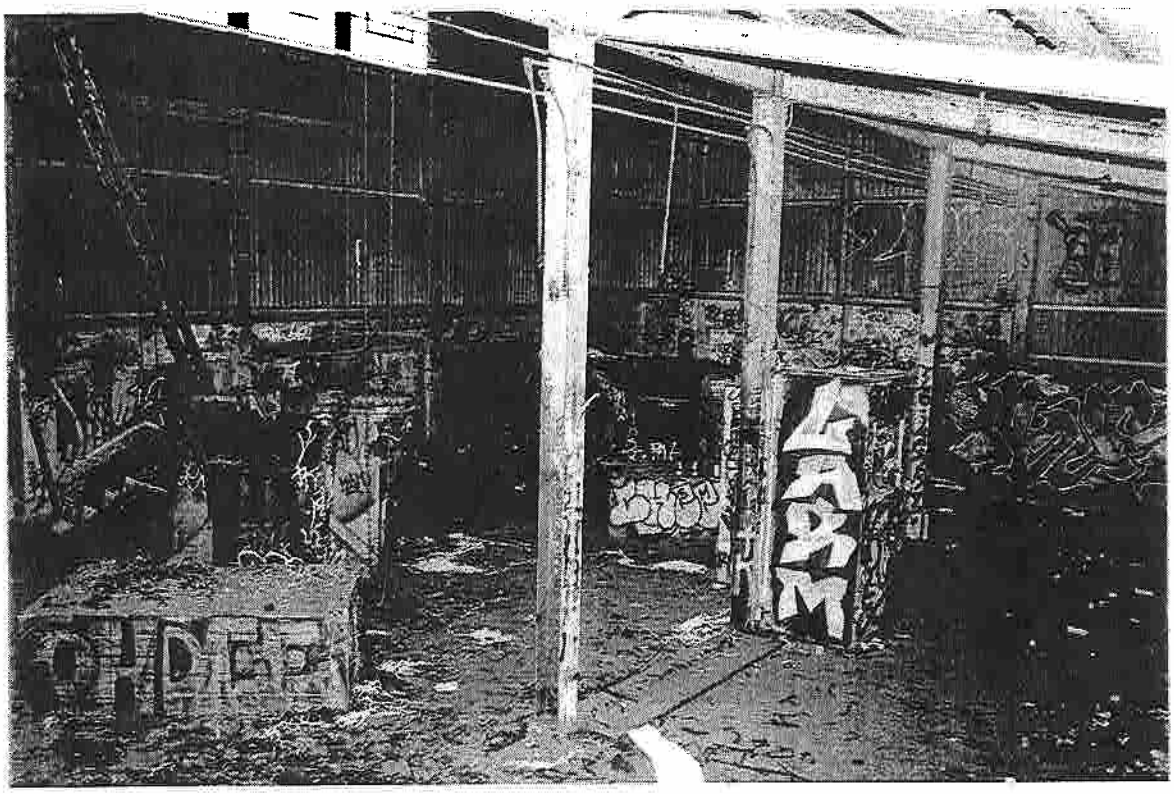


PHOTO 2: Pump House, Station A
(view of interior)

State of California – The Resource s Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #_____
HRI #_____
Trinomial_____
NRHP Status Code_____

Other Listings
Review Code _____Reviewer _____Date_____

Page 1 of 3 *Resource Name or #: Meter House, Station A

P1. Other Identifier: NA
*P2. Location: Not for Publication Unrestricted X *a. County San Francisco
and (P2b and P2c or P2d. Attach a Location Map as necessary)
b. USGS 7.5' Quad San Francisco North Date 1993 T2S ; R5W ; Unsectioned ; B.M. Mt. Diablo
c. Address 1201 Illinois Street City San Francisco Zip 94107
d. UTM: Zone _____;SW/; SE/; NW/ and NE/
e. Other Location Data: (e.g. parcel #, directions to resource, elevation, etc. as appropriate)
The Meter House is part of this group of five industrial buildings at 1201 Illinois Street is located at the northeast corner of Illinois Street and 23rd Street (APN Block 4174, Lot 3) in the southeast area (Potrero) of the City of San Francisco in the vicinity of San Francisco Bay and Islais Creek. The Meter House is next to the north side of the Compressor House and is just west of the Station A power plant office.

*P3a. Description (Describe the resource and its major elements. Include design, materials, condition, alterations, size, setting & boundaries):

The Meter House is a rectangular plan, brick masonry structure with a gable roof covered with corrugated metal (Photo 1). The gable roof has a monitor at the ridge. Structurally, the building has a concrete foundation and steel truss roof structure. The building is three bays wide and eight bays in length. Buttresses approximately a foot wide frame each bay on the exterior walls. The west façade has a modern, steel roll-up door to the left of two, wood-sash, 12 over 12, segmental arch windows. The same type of windows are on the south (7 windows) and east façades (3 windows). The windows have thick, protruding concrete sills. Large round arch windows are also below the east and west end gables. A modern hinged double door opens into the interior from the eastern end of the south façade. A large transom is above the door. Inside, the Meter House has a scored concrete floor and a modern dropped ceiling with modern fluorescent lighting fixtures.

*P3b. Resource Attributes: HP8
*P4. Resources present: X Building ____Structure____ Object ___ Site X District__ Element of District___ Other

P5a. Photo or Drawing

SEE CONTINUATION SHEET

P5b. Description of Photo:

*P6. Date Constructed/Age and Sources: X Historic ____Prehistoric _____Both c.1914

*P7. Owner and Address
The Southern Company
1201 Illinois Street
San Francisco, CA 94107

*P8. Recorded by: (Name, affiliation, and address) Ward Hill, Architectural Historian, 3124 Octavia Street, San Francisco, CA 94123

*P9. Date Recorded December, 1999

*P10. Survey Type: (Describe) Intensive

*P11. Report Citation (Cite survey report and other sources, or enter none)
Historic Architecture Report, Station A, Potrero Power Plant
Attachments: ____NONE___ Location Map __Sketch Map X Continuation Sheet __ Building, Structure and Object Record___
Archaeological Record ___ District Record____ Linear Feature Record____ Milling Station Record _____Rock Art Record _____
Artifact Record _____ Photograph Record _____ Other (List)

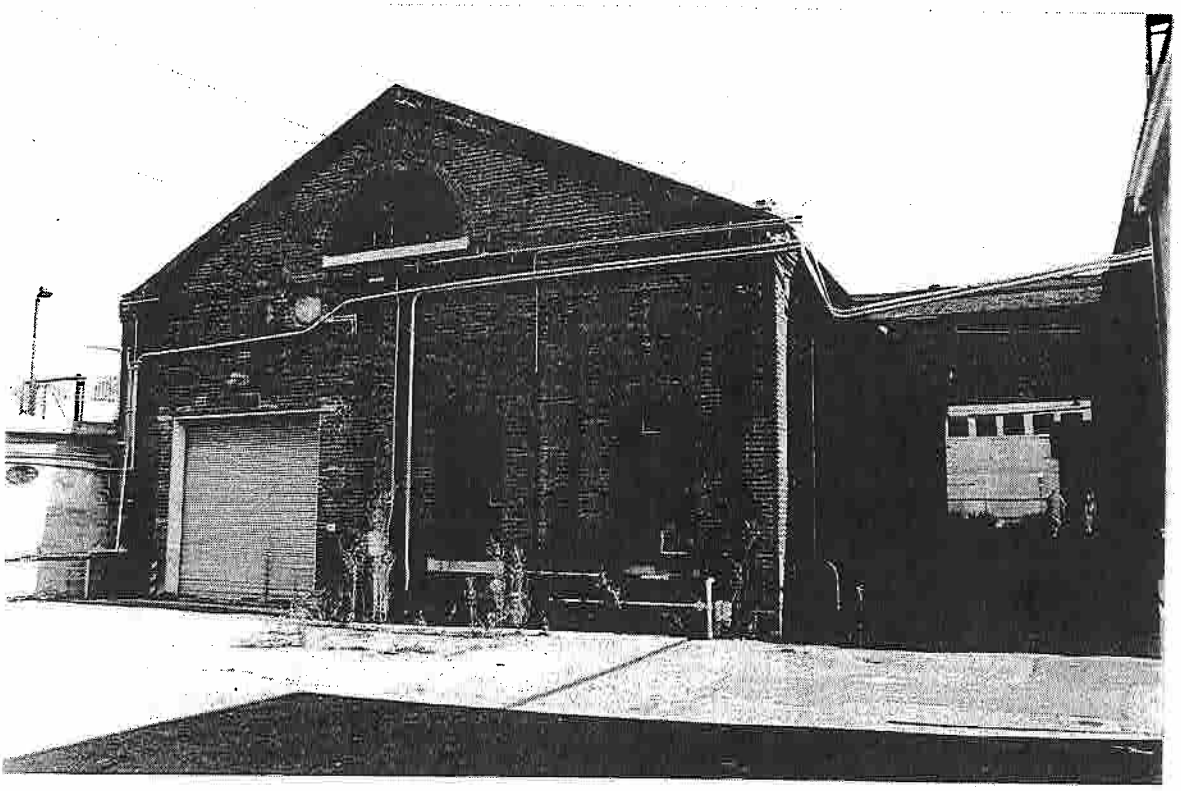


PHOTO 1: Meter House, Station A
(view from southwest)

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary #_____
HRI #_____
Trinomial_____

Page 3 of 3 *Resource Name or # (assigned by recorder) Meter Building, Station A

*Recorded by Ward Hill *Date: December, 1999 X Continuation __Update

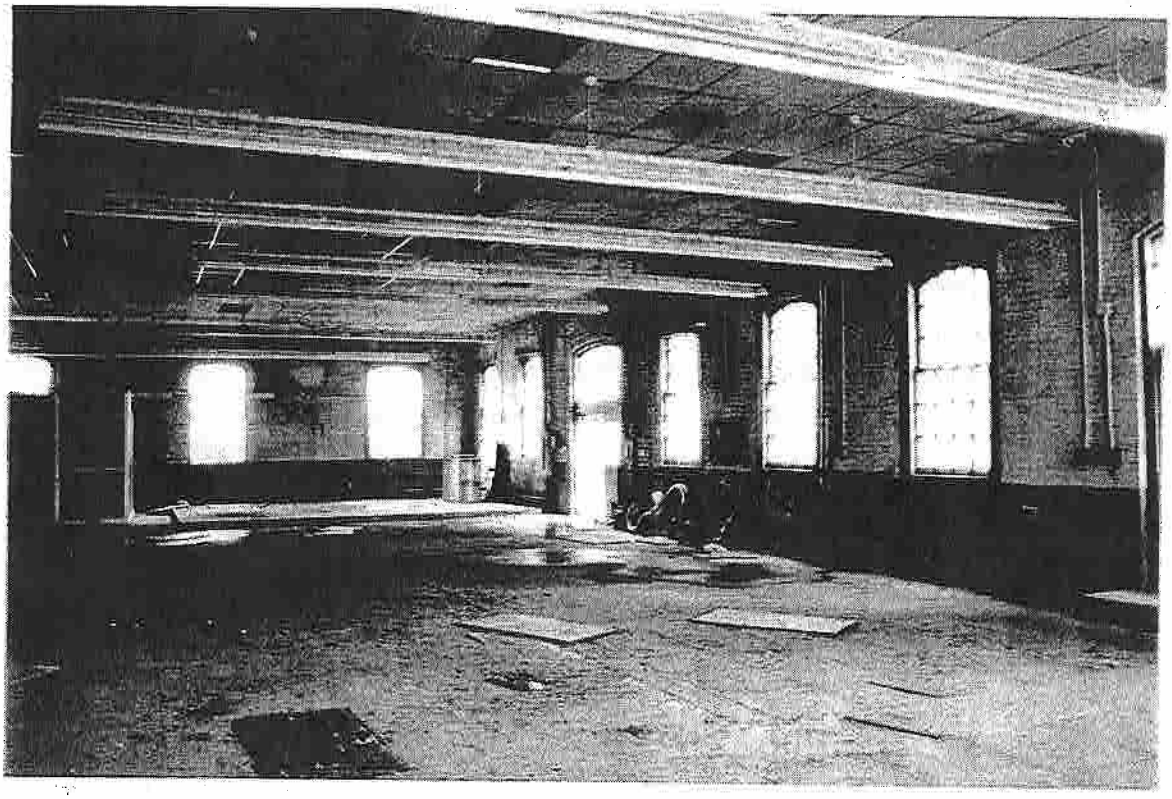


PHOTO 2: Meter House, Station A
(view of interior)

State of California – The Resource s Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #_____
HRI #_____
Trinomial_____
NRHP Status Code_____

Other Listings
Review Code _____Reviewer _____Date_____

Page 1 of 4 *Resource Name or #: Compressor House, Station A

P1. Other Identifier: NA
*P2. Location: Not for Publication Unrestricted X *a. County San Francisco
and (P2b and P2c or P2d. Attach a Location Map as necessary)
b. USGS 7.5' Quad San Francisco North Date 1993 T 2S ;R 5W ; Unsectioned ; B.M. Mt. Diablo
c. Address 1201 Illinois Street City San Francisco Zip 94107
d. UTM: Zone _____;SW/; SE/; NW/ and NE/
e. Other Location Data: (e.g. parcel #, directions to resource, elevation, etc. as appropriate)
The Compressor House is part of a group of five industrial buildings at 1201 Illinois Street located at the northeast corner of Illinois Street and 23rd Street (APN Block 4174, Lot 3) in the southeast area (Potrero) of the City of San Francisco in the vicinity of San Francisco Bay and Islais Creek. The Compressor House is south of the Meter House and is just west of the Station A power plant.

*P3a. Description (Describe the resource and its major elements. Include design, materials, condition, alterations, size, setting & boundaries): A L-shaped plan, steel frame building with brick infill, the Compressor House stored compressors for maintaining pressure in gas lines. The simply detailed brick exterior walls (on a concrete foundation) have Renaissance/Baroque details such as rustication at corners and around door openings, a raised base, and a frieze around the perimeter of the cornice (Photos 1 & 2). The building has two modern, metal roll-up garage doors on the east and north façades, and single roll-up doors on the south and west façades. A multi-pane, industrial sash window is above each door; these are the building's only windows. The interior has steel roof trusses attached to the exposed steel framing columns (Photo 3). The trusses run east/west in the northern section, then north/south in the southern extension of the interior. The ridge of the roof gable has a central monitor that brings natural light into the largely windowless interior. The interior has a scored concrete floor.

*P3b. Resource Attributes: HP8
*P4. Resources present: X Building ____Structure____ Object ___ Site X District__ Element of District___ Other

P5a. Photo or Drawing

SEE CONTINUATION SHEET

P5b. Description of Photo:

*P6. Date Constructed/Age and Sources: X Historic ____Prehistoric _____Both 1924

*P7. Owner and Address
The Southern Company
1201 Illinois Street
San Francisco, CA 94107

*P8. Recorded by: (Name, affiliation, and address) Ward Hill, Architectural Historian, 3124 Octavia Street, San Francisco, CA 94123

*P9. Date Recorded December, 1999

*P10. Survey Type: (Describe)
Intensive

*P11. Report Citation (Cite survey report and other sources, or enter none)
Historic Architecture Report, Station A, Potrero Power Plant

Attachments: ____NONE__ Location Map __Sketch Map X Continuation Sheet __ Building, Structure and Object Record___
Archaeological Record ___District Record____ Linear Feature Record____ Milling Station Record _____Rock Art Record _____
Artifact Record _____ Photograph Record _____ Other (List)

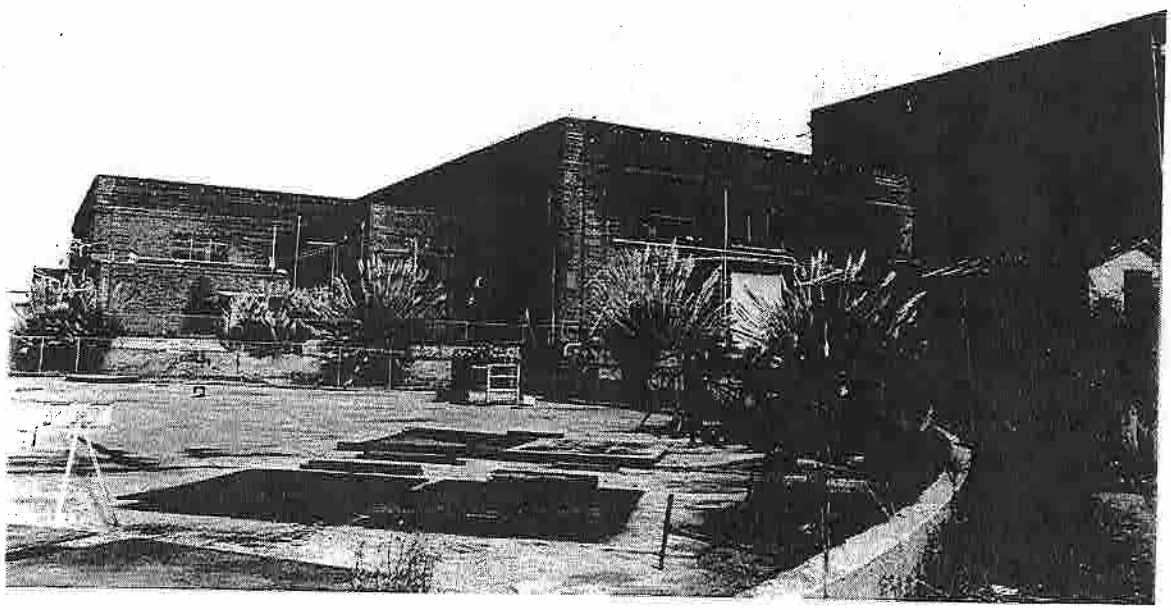


PHOTO 1: Compressor House, Station A
(view from northeast)

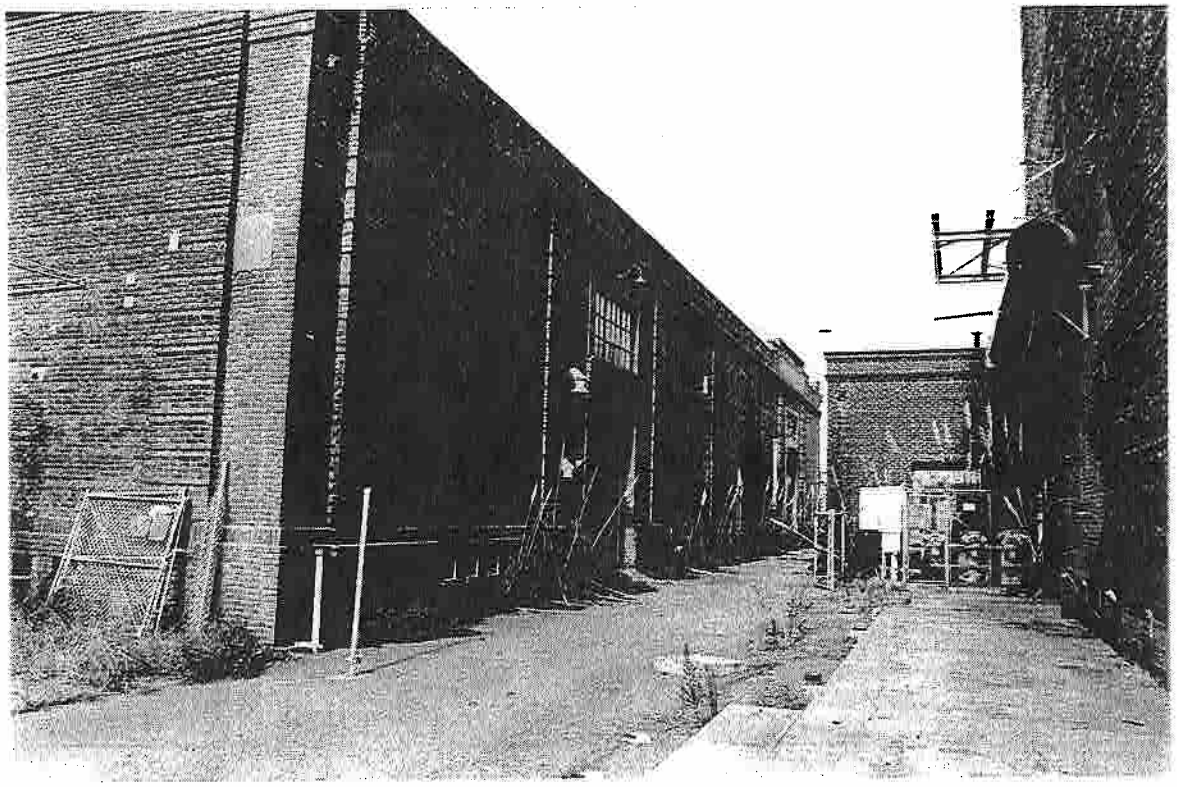


**PHOTO 2: Compressor House, Station A
(view from northeast)**

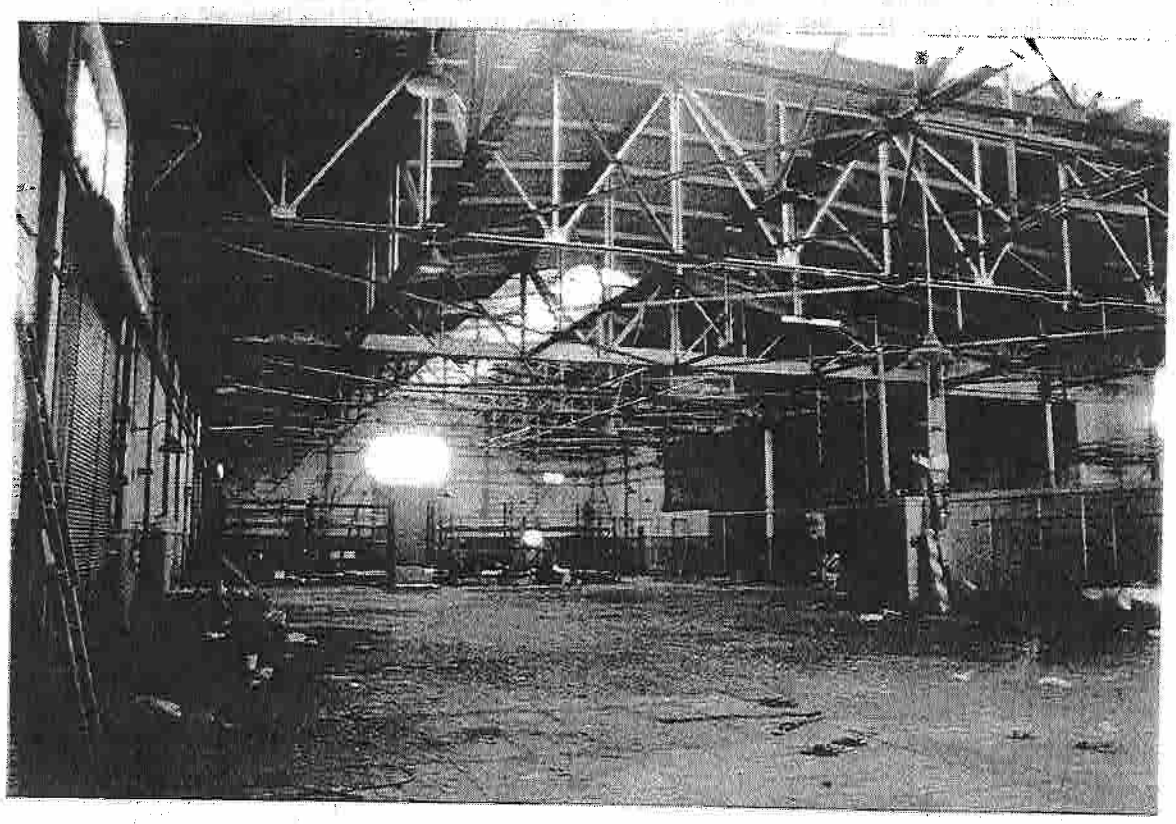


**PHOTO 3: Compressor House, Station A
(view of interior)**

State of California – The Resource s Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #_____
HRI #_____
Trinomial_____
NRHP Status Code_____

Other Listings
Review Code _____Reviewer _____Date_____

Page 1 of 2 *Resource Name or #: Gate House, Station A

P1. Other Identifier: NA

*P2. Location: Not for Publication Unrestricted X *a. County San Francisco

and (P2b and P2c or P2d. Attach a Location Map as necessary)

b. USGS 7.5' Quad San Francisco North Date 1993 T 2S ;R 5W ; Unsectioned ; B.M. Mt. Diablo

c. Address 1201 Illinois Street City San Francisco Zip 94107

d. UTM: Zone _____;SW/; SE/; NW/ and NE/

e. Other Location Data: (e.g. parcel #, directions to resource, elevation, etc. as appropriate)

The Gate House is part of a group of five industrial buildings at 1201 Illinois Street located at the northeast corner of Illinois Street and 23rd Street (APN Block 4174, Lot 3) in the southeast area (Potrero) of the City of San Francisco in the vicinity of San Francisco Bay and Islais Creek. The Gate House is near 23rd Street and just east of the Station A power plant.

*P3a. Description (Describe the resource and its major elements. Include design, materials, condition, alterations, size, setting & boundaries):
A small, rectangular plan, brick masonry building, the Gate House was originally attached to the east wall of the power plant's boiler room (Photo 1; see Station A Primary Record, Photo 4). The Gate House became a freestanding structure after the boiler room was demolished in 1983. Part of the boiler room's exterior wall is still visible, attached at the rear of the Gate House. A plant shop was adjacent to the north façade of the Gate House. The front façade of the Gate House has a classical cornice with a frieze and a base delineated with brick headers. Molded brick frames the two wood-sash, double-hung windows and the adjacent entrance door on the right side of the front façade. The Gate House has three windows on the south façade. The interior of the Gate House was not accessible.

*P3b. Resource Attributes: HP8

*P4. Resources present: X Building ____Structure____ Object ___ Site X District___ Element of District___ Other

P5a. Photo or Drawing

SEE CONTINUATION SHEET

P5b. Description of Photo:

*P6. Date Constructed/Age and Sources: X Historic ____Prehistoric _____Both 1901

*P7. Owner and Address
The Southern Company
1201 Illinois Street
San Francisco, CA 94107

*P8. Recorded by: (Name, affiliation, and address) Ward Hill, Architectural Historian, 3124 Octavia Street, San Francisco, CA 94123

*P9. Date Recorded December, 1999

*P10. Survey Type: (Describe)
Intensive

*P11. Report Citation (Cite survey report and other sources, or enter none)
Historic Architecture Report, Station A, Potrero Power Plant

Attachments: ____NONE__ Location Map ___Sketch Map X Continuation Sheet __ Building, Structure and Object Record___
Archaeological Record ___District Record____ Linear Feature Record____ Milling Station Record _____Rock Art Record _____
Artifact Record _____ Photograph Record _____ Other (List)

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

CONTINUATION SHEET

Primary #_____
HRI #_____
Trinomial_____

Page 2 of 2

*Resource Name or # (assigned by recorder) Gate House, Station A

*Recorded by Ward Hill *Date: December, 1999 X Continuation __Update

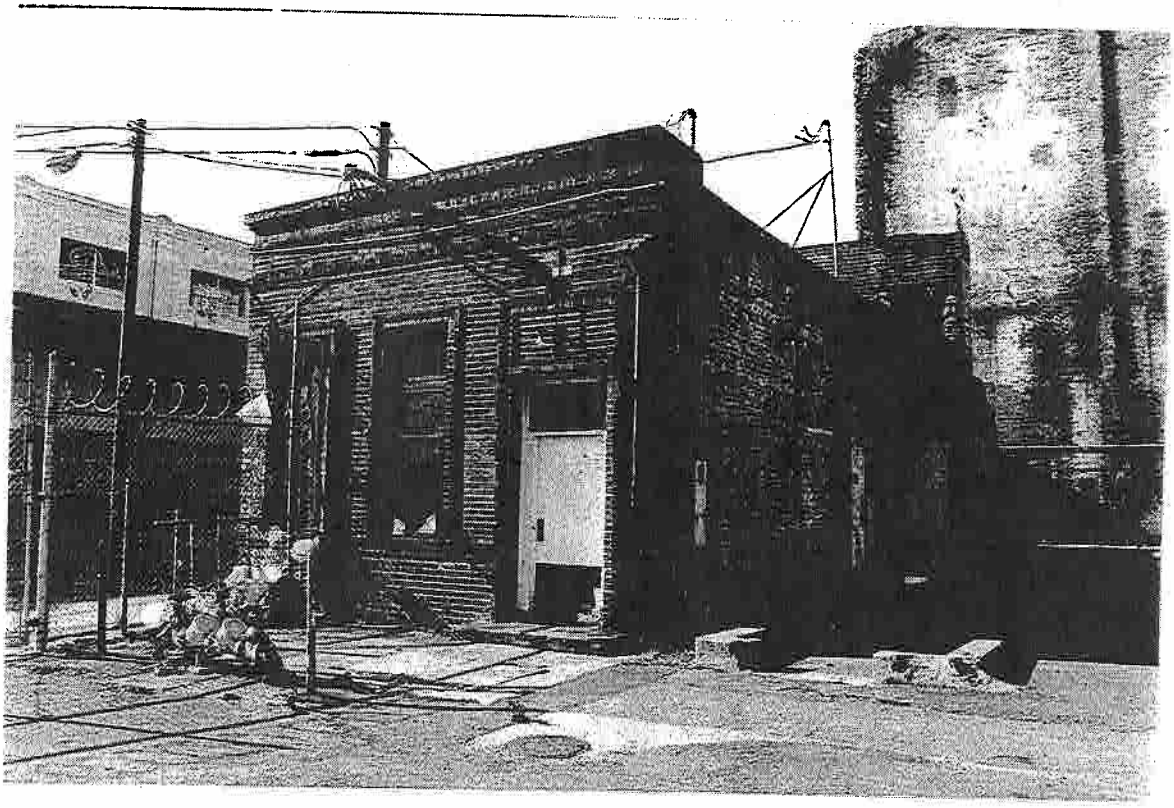


PHOTO 1: Gate House, Station A
(view from northeast)

State of California – The Resource s Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #_____
HRI #_____
Trinomial_____
NRHP Status Code_____

Other Listings
Review Code _____Reviewer _____Date_____

*Resource Name or #: Station A

P1. Other Identifier: NA

*P2. Location: Not for Publication Unrestricted X *a. County San Francisco

and (P2b and P2c or P2d. Attach a Location Map as necessary)

b. USGS 7.5' Quad San Francisco North Date 1993 T 2S; R 5W ; Unsectioned ; B.M. Mt. Diablo

c. Address 1201 Illinois Street City San Francisco Zip 94107

d. UTM: Zone _____;SW/; SE/; NW/ and NE/

e. Other Location Data: (e.g. parcel #, directions to resource, elevation, etc. as appropriate)

The Station A is part of a group of five industrial buildings at 1201 Illinois Street located at the northeast corner of Illinois Street and 23rd Street (APN Block 4174, Lot 3) in the southeast area (Potrero) of the City of San Francisco in the vicinity of San Francisco Bay and Islais Creek. The Station A spans the width of the block between 23rd Street to Humboldt Street.

*P3a. Description (Describe the resource and its major elements. Include design, materials, condition, alterations, size, setting & boundaries):
The original Station A power plant consisted of primarily two long rectangular spaces divided by an interior brick wall (Figure 1, Photo 1). The exterior brick walls are reportedly 4 feet thick. The boiler room on the east was 64 feet wide and 434 feet long. A series of small shop buildings were adjacent to the east side of the boiler. West of the boiler room, the turbine or generator room was 57 feet wide and 434 feet long. The building is approximately 65 feet tall. The plant has a concrete perimeter foundation and un-reinforced brick masonry walls. The original roof structure was a gabled wooden truss. The simply detailed east façade (east wall of the boiler room) had a series of inset panels above a series of round arch windows (Photo 1). The double false front gables on the north and south facades had deeply inset, vertical, segmental arched industrial sash windows on the second and third floors (Photos 2 & 3). The segmental arched third floor windows were shorter than the second and third floor windows. A central doorway on the south façade opened into the boiler room.

*P3b. Resource Attributes: HP8
*P4. Resources present: X Building ____Structure____ Object ___ Site X District___ Element of District___ Other

P5a. Photo or Drawing

SEE CONTINUATION SHEET

P5b. Description of Photo:

*P6. Date Constructed/Age and Sources: X Historic ____Prehistoric _____Both 1901, remodeled 1930

*P7. Owner and Address
The Southern Company
1201 Illinois Street
San Francisco, CA 94107

*P8. Recorded by: (Name, affiliation, and address) Ward Hill, Architectural Historian, 3124 Octavia Street, San Francisco, CA 94123

*P9. Date Recorded December, 1999

*P10. Survey Type: (Describe)
Intensive

*P11. Report Citation (Cite survey report and other sources, or enter none)
Historic Architecture Report, Station A, Potrero Power Plant

Attachments: ____NONE__ Location Map ____Sketch Map X Continuation Sheets __ Building, Structure and Object Record___
Archaeological Record ___District Record____ Linear Feature Record____ Milling Station Record _____Rock Art Record _____
Artifact Record _____ Photograph Record _____ Other (List)

* Required Information

***P3a. Description continued**

A rectangular plan, reinforced concrete plant office is still adjacent to the building's northwest corner. A shop area was below the office. The office main entrance is on what was then known as Humboldt Street (Photos 2 & 3). The interior of the office was not accessible. A series of windows opens out from the west façade of the office. The classical temple front façade has a main gable pediment above a frieze with dentils. Gabled pediments are above the windows flanking the central entrance below a segmental arch pediment. Pilasters frame the front façade door and adjacent windows. A concrete side stairs leads up from the street to the entrance door.

The power plant has been extensively remodeled several times since its original construction in 1901. Replacing the wood truss roof with a steel truss roof was an early alteration (approximately 1911). The south and much of the west façade were extensively remodeled in 1930 (Photos 4 & 5). A new steel frame and concrete electrical switch room extended two bays out from the west façade. This major addition also covered over 50 % of the original west façade. The three-story switch room has a five course American bond brick facing with Renaissance/Baroque ornamental details, including rustication, inset panels, a molded raised base and a classical cornice with frieze (Photos 6 & 7). The south façade of the addition has pairs of industrial sash windows on each floor. The west façade of the addition is a solid brick wall except for the first floor loading dock and the second and third floor windows on the south. The interior of the switch room was not accessible. According to floor plans of the switch room on file at Station A, the addition was divided into a number of small rooms on each floor housing electrical control boards.

The original gabled south façade was totally rebuilt to match the classical details of the new addition. The horizontal cornice aligned with the addition replaced the double gables. The original narrow, deep inset windows were also larger, square industrial sash windows flush with the exterior wall. A huge addition to the roof of the boiler room was also faced with brick with classical details matching the addition. The 1930 remodeling did not include the plant's original north façade and the northern half of the west façade (Photo 3). In 1983, the boiler room and the adjacent shops (except the Gate House) were demolished. The Station A east façade visible today is the interior wall that originally divided the turbine room from the boiler room (Photo 8). The equipment joining the boilers to the turbines passed through the various openings in this wall. The north facade and part of the west facade of the turbine room (including the office on the west) are the only surviving features of the original plant's exterior.

The interior of the turbine room was also extensively altered in 1930 (Photo 9 & 10). The turbine room is a large, open, free-span space with brick walls and a concrete floor. In 1930, almost two-thirds of the roof over the turbine room was rebuilt (with a new monitor) to accommodate new turbines. The roof is covered with corrugated metal. Also, a concrete second floor level (the turbine deck) and large concrete turbine pedestals at the southern half of the turbine room were also constructed. The first floor of the remodeled interior was used for condenser feed pumps serving the turbines. The original equipment was removed from the turbine room in 1983 when the plant closed.

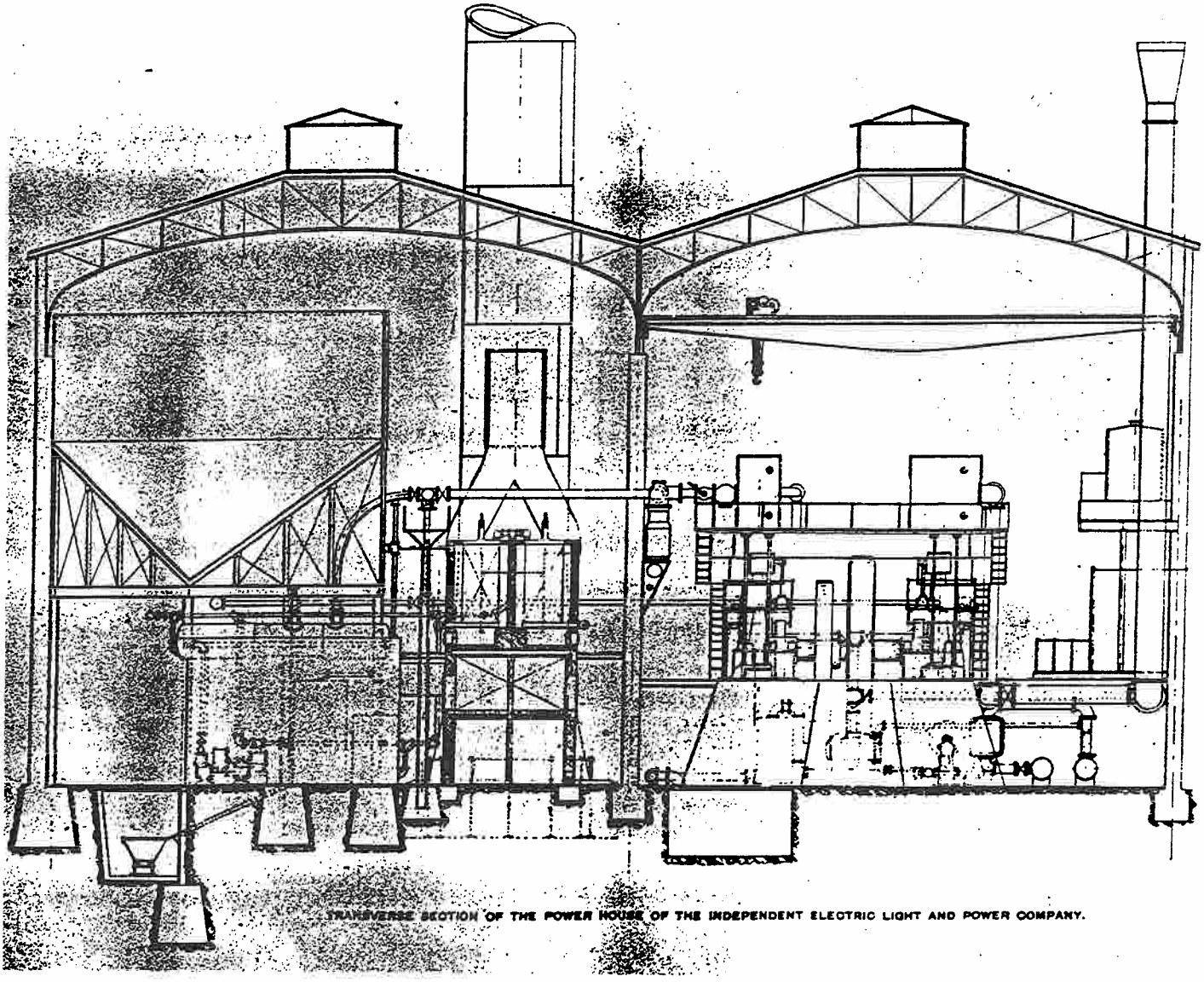


FIGURE 1: Station A
(Source: "Independent Electric Light and Power Company,
The Journal of Electricity, Power and Gas, December, 1901, pg. 277)

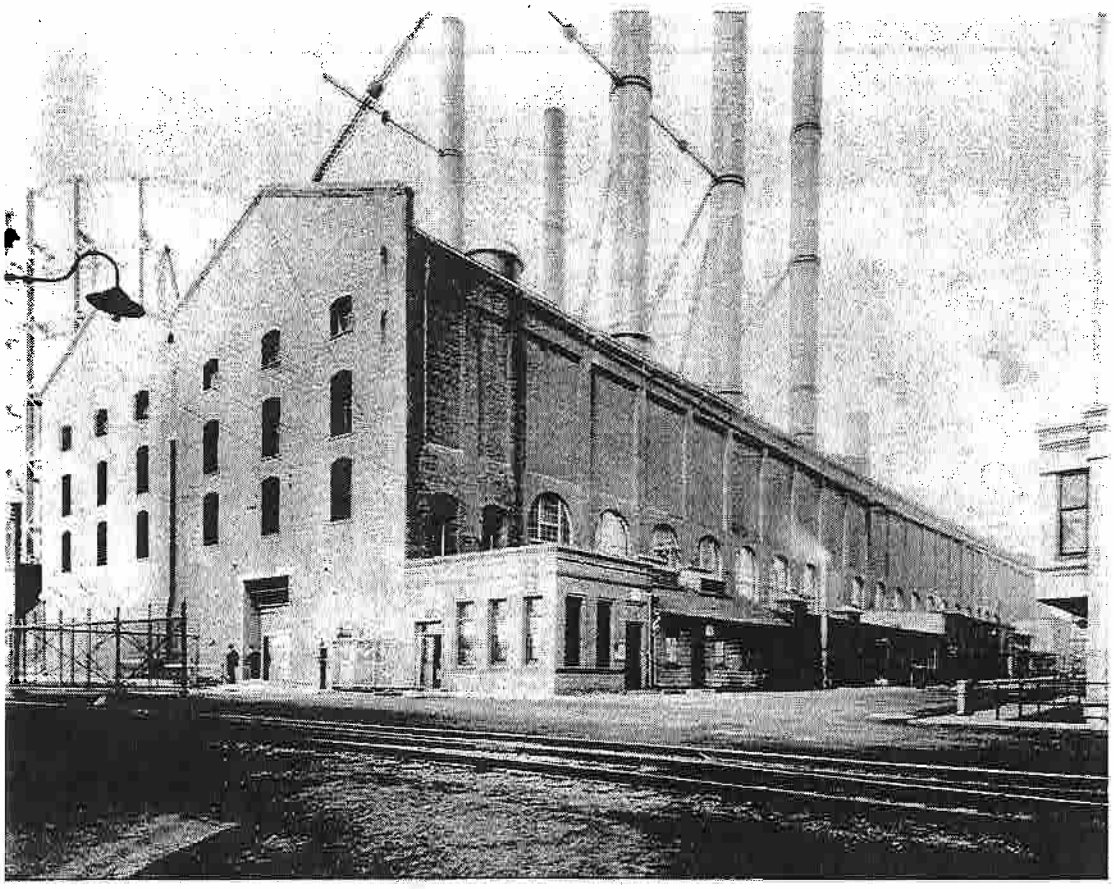
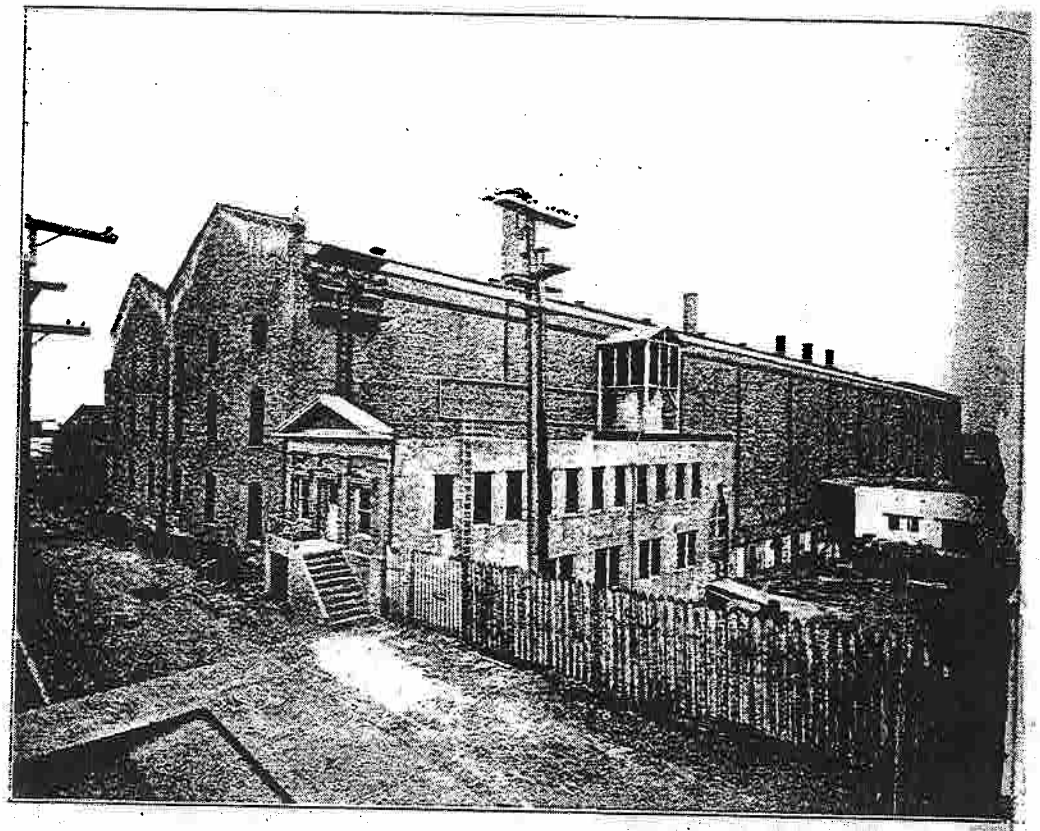


PHOTO 1: Station A
c. 1910 view from southeast
(Source: San Francisco History Center, San Francisco Public Library)

This photo may not be published without consent from the San Francisco History Center



STATION A, SAN FRANCISCO.

It is at the corner of Twenty-third and Louisiana Streets, and extends from Humboldt Street (shown in the foreground) south to Twenty-third Street. The smaller building is the office, with its main entrance on Humboldt Street. The entire nearer part of the long double building contains the engine room; the further part, the boiler-room.

PHOTO 2: Station A
1911 view from northwest
(Source: *Pacific, Gas and Electric – Historical and Descriptive*, c. 1911)

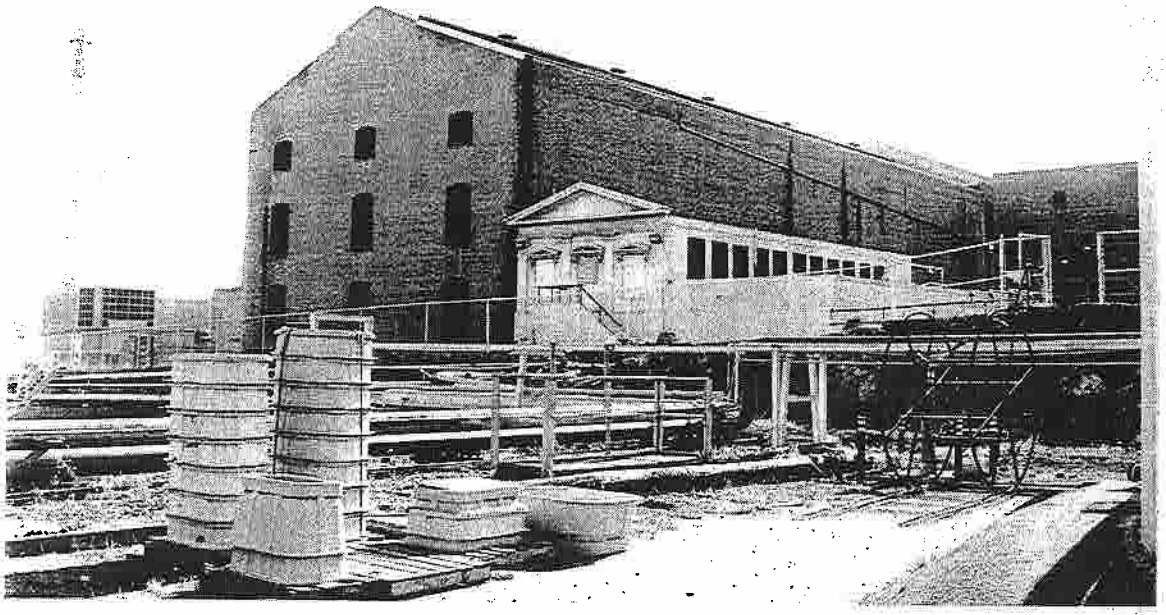


PHOTO 3: Station A
view from northeast
(extant section of 1901 Turbine Room and office)

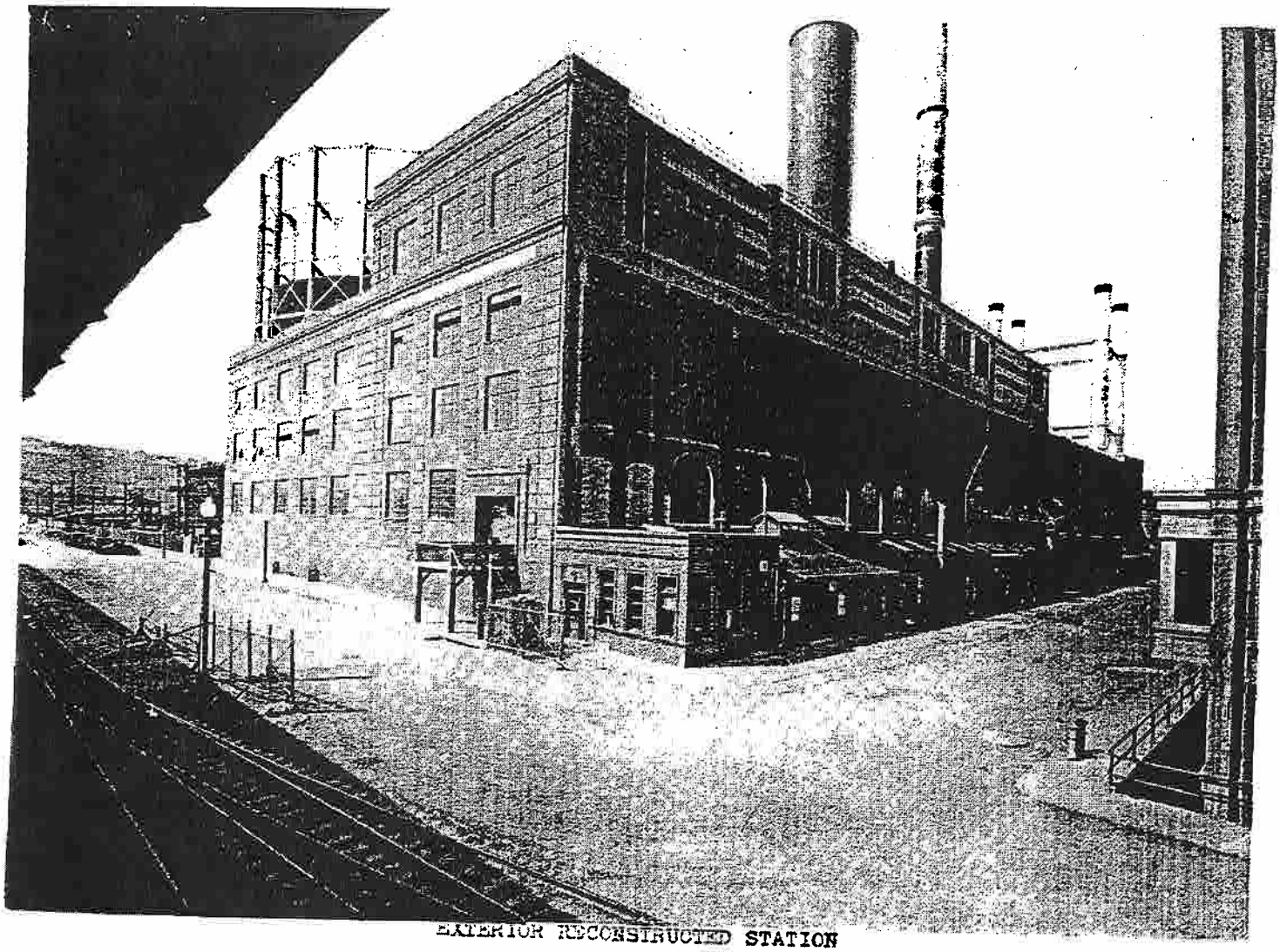
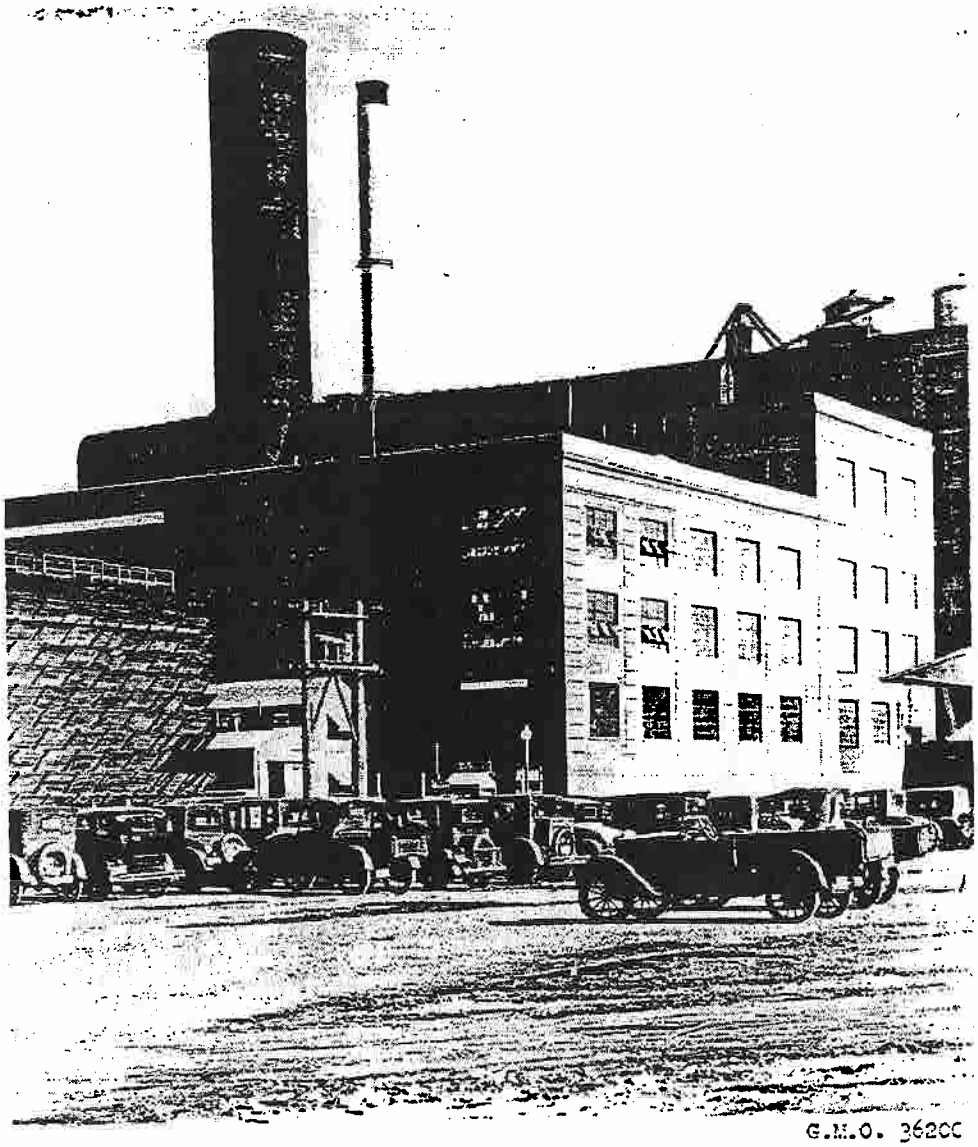


PHOTO 4: Station A
1932 view from southeast
Source: *P.G. & E Unit Cost Report on the Reconstruction of Station A, 1932*



Exterior of Reconstructed Station

PHOTO 5: Station A
1932 view from southwest
Source: *P.G. & E Unit Cost Report on the Reconstruction of Station A, 1932*

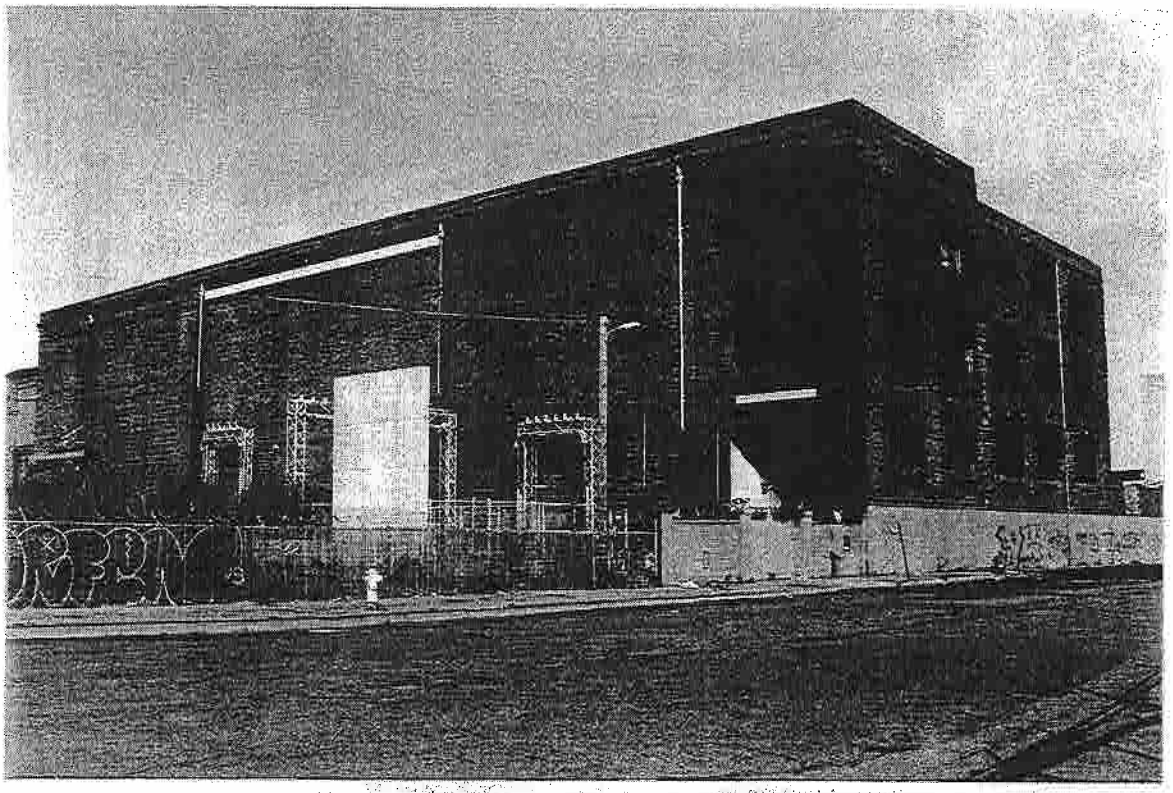


PHOTO 6: Station A
(view from southwest)

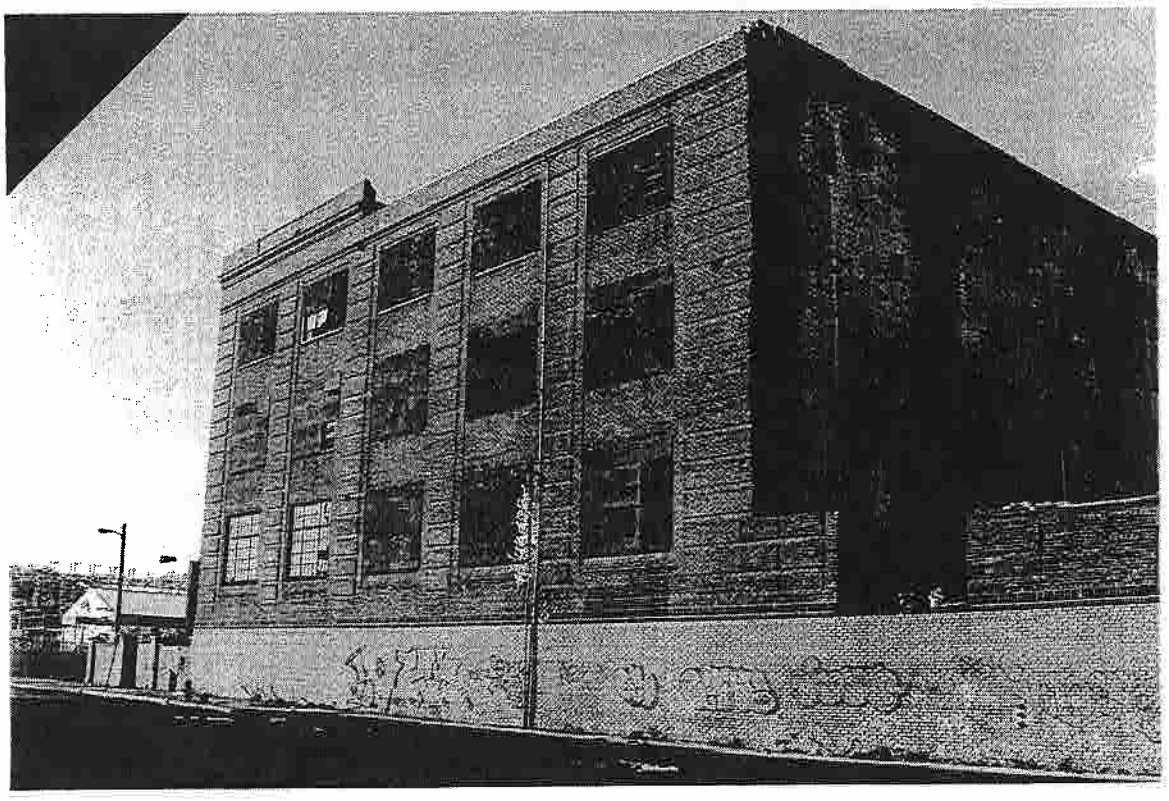


PHOTO 7: Station A
(view from southeast)

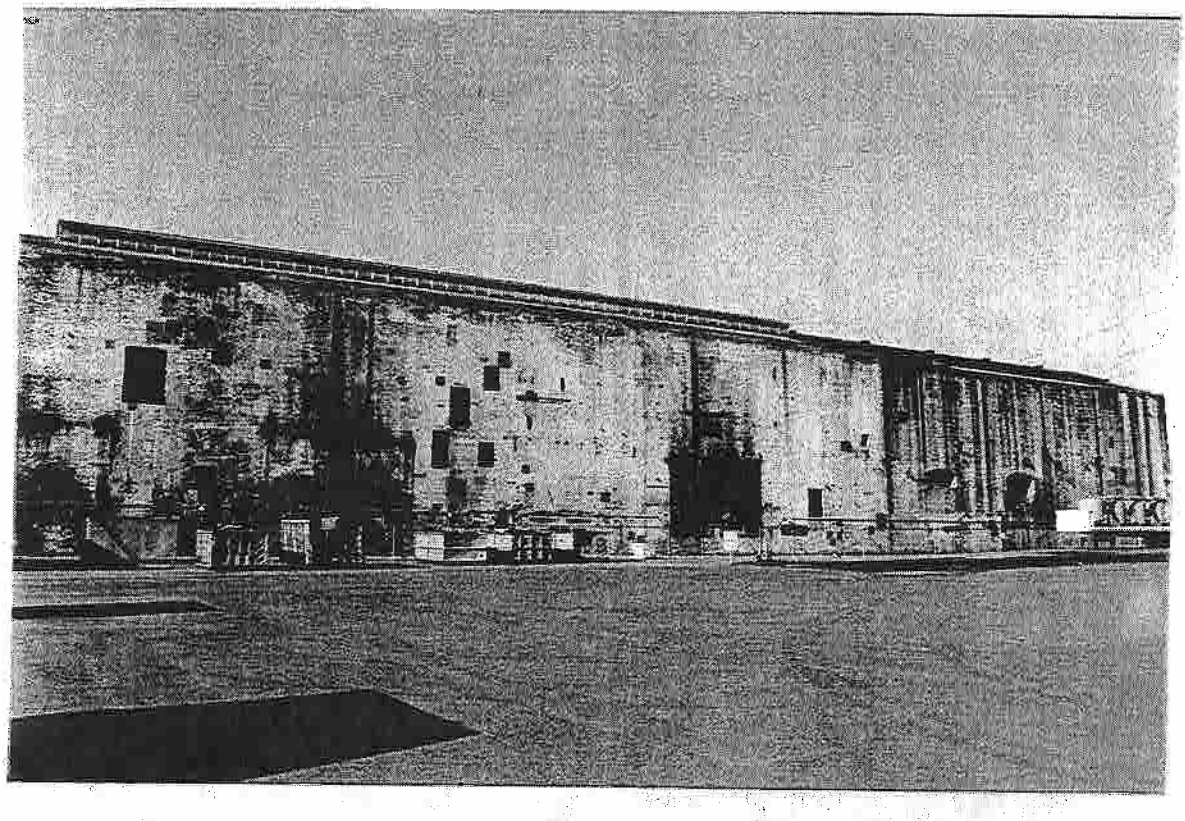
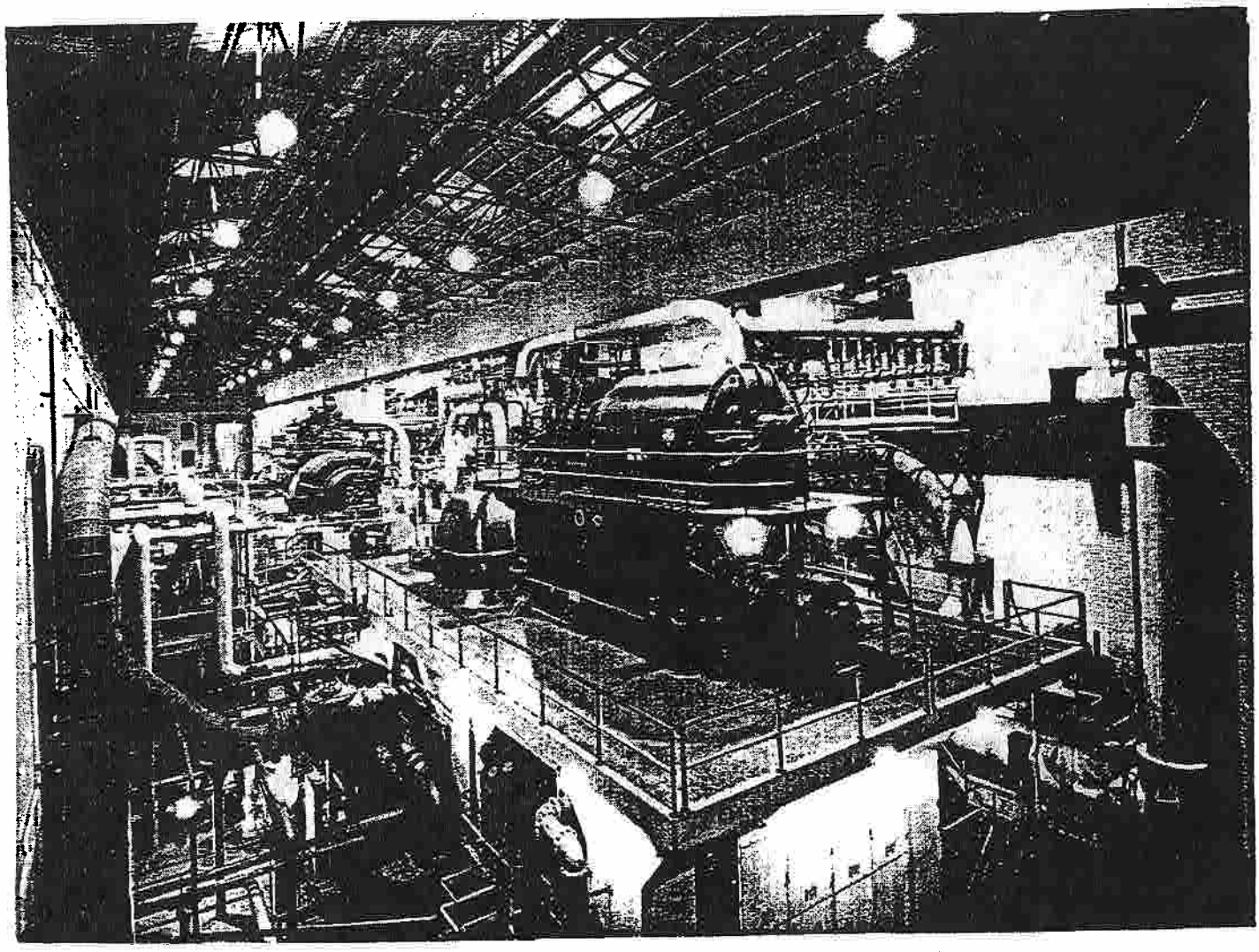


PHOTO 8: Station A
(view of east façade from southeast)



TURBINE ROOM [illegible] 182 (LOOKING NORTH)

PHOTO 9: Station A
1932 view of Turbine Room
Source: *P.G. & E Unit Cost Report on the Reconstruction of Station A, 1932*

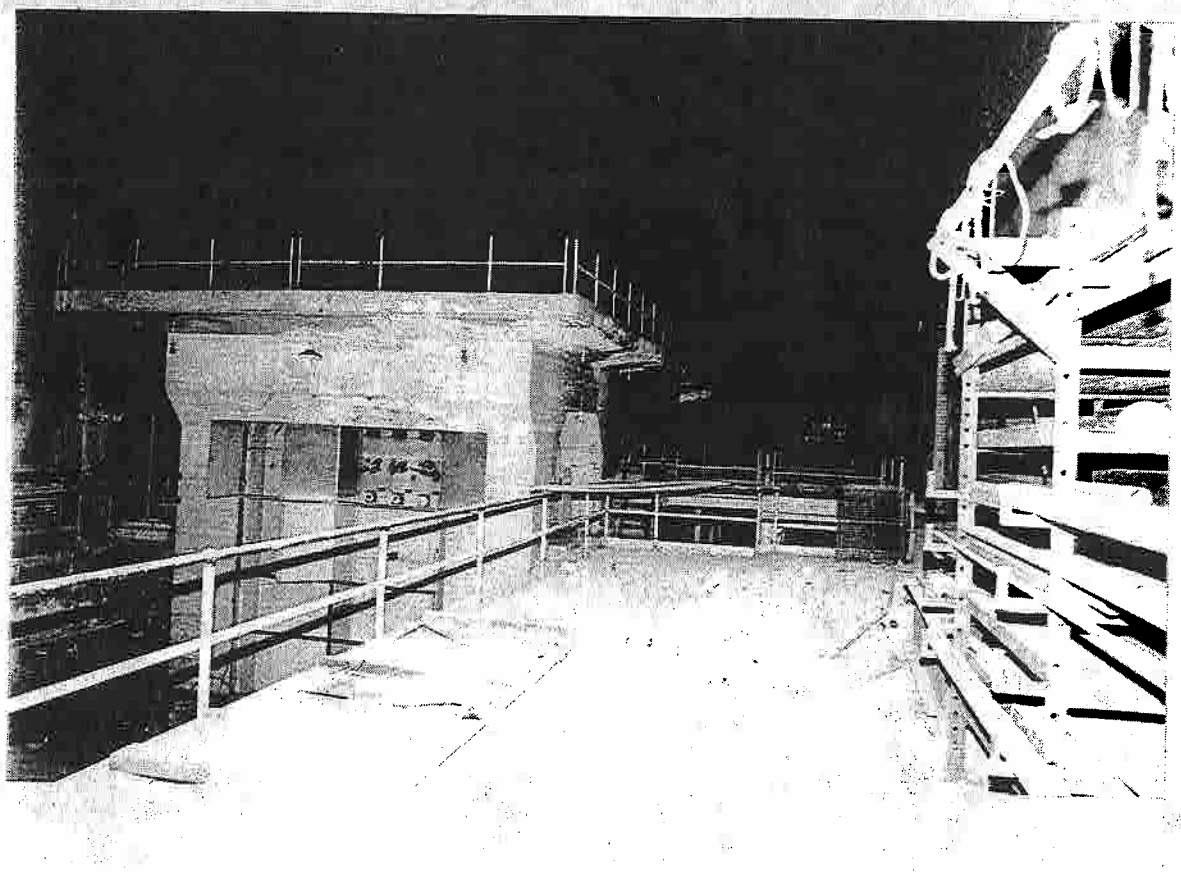


PHOTO 10: Station A
(view of Turbine Room interior)

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # P-07-002568
HRI #
Trinomial CA-CCo-749H
NRHP Status Code
Other Listings
Review Code Reviewer Date

Page 1 of 5 *Resource Name or #: (Assigned by Recorder) C-Antioch South-1

P1. Other Identifier: Central Pacific Railroad (now Union Pacific Railroad)

*P2. Location: ☐ Not for Publication ☒ Unrestricted *a. County Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad Honker Bay Date 1980 T 2N ; R 1E ; ¼ of ¼ of Sec ; MDM B.M.

c. Address (Map #4813) City Zip

d. UTM: (Give more than one for large and/or linear resources) Zone: 10 ; See P2e mE/ mN

e. Other Locational Data: (e.g. parcel #, directions to resource, elevation, etc., as appropriate)

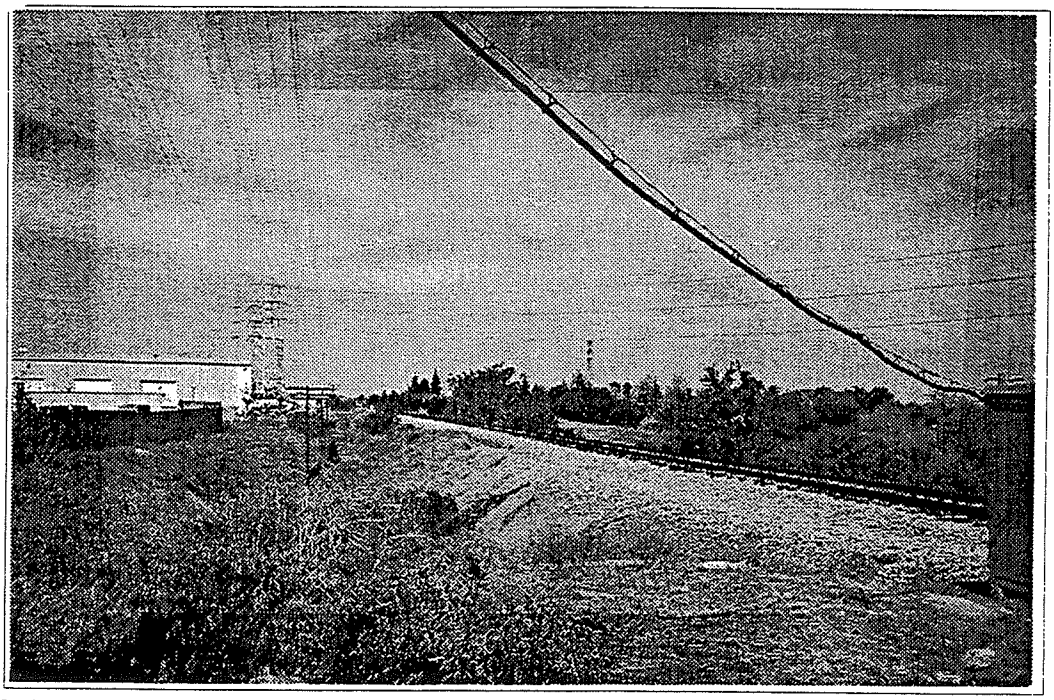
Segment of Railroad between West Pittsburg and Antioch. This segment is also located on the the Antich North and Antioch South quad. maps. 593840mE / 4209560mN to 607040mE / 4205990mN. T2N, R1W Section 12; T2N, R1E Unsectioned; T2N, R2E Section 19 & 20.
(593540E) (add utm: 601500E/4207340N)

*P3a. Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The resource consists of a portion of the Union Pacific Railroad alignment, originally the Central Pacific Railroad. The alignment is formed by an earthen berm and is currently in use. The berm elevates tracks above the surrounding land. The grade is variable, but is as large as about 50 feet high (10 feet high is typical) and the base the berm measures 166' across. The Central Pacific extended their lines to Contra Costa County in 1877 (Purcell 1940:487). In 1878 the Central Pacific Railroad through their subsidiary, the San Pablo & Tulare Railroad Company, served the cities of Richmond, San Pablo, Rodeo, Crockett, Port Costa, Martinez, Avon, Pittsburg, Antioch, Brentwood and Bryon in Contra Costa county. This railroad, constructed between 1876 and 1878, consisted of 46.51 miles of track between Martinez and Tracey. The SP&T Company was operated by the Central Pacific until 1885 when it became the Southern Pacific Company Railroad (Dunscomb 1967:407). The Union Pacific acquired the Southern Pacific in 1996.

*P3b. Resource Attributes: (List attributes and codes) HP11. Engineering structure (Railroad Grade)

Resources present: ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (isolates, etc.)



P5b. Description of Photo: (View, date, accession #)

*P6. Date Constructed/Age and Sources: ☒ Historic ☐ Prehistoric ☐ Both

*P7. Owner and Address: Union Pacific Railroad

*P8. Recorded by: (Name, affiliation, and address) Barry Scott Jones & Stokes Associates 2600 V Street, Sacramento, CA

*P9. Date Recorded: 4/15/99

*P10. Survey Type: (Describe) Reconnaisance survey using intensive pedestrian survey techniqes

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Cultural Resource Inventory Report for the Williams Communications Fiber Optic Cable Project, Pittsburg to Sacramento, California

*Attachments: NONE ☒ Location Map ☐ Sketch Map ☐ Continuation Sheet ☐ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☒ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record
☐ Artifact Record ☐ Photograph Record ☐ Other (List):

DPR 523A (1/95)

*Required Information

5-22464

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary # P-07-002568
HRI #
Trinomial CA-CCO-749H

Page 2 of 5 *Resource Name or #: (Assigned by Recorder) C-Antioch South-1

L1. Historic And/or Common Name: Central Pacific Railroad (now Union Pacific Railroad)

Portion Described: ☐ Entire Resource ☒ Segment ☐ Point Observation **Designation:** C-Antioch South-1

b. Location of point or segment: (Provide UTM coordinates, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map)
Segment of Railroad between West Pittsburg and Antioch. This segment is also located on the the Antich North and Antioch South quad. maps. 593840mE / 4209560mN to 607040mE / 4205990mN. T2N, R1W Section 12; T2N, R1E Unsectioned; T2N, R2E Section 19 & 20.

L3. Description: (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.)
The resource consists of the Central Pacific Railroad, now the Union Pacific Railroad. The railroad is currently in use and is maintained. The railroad grade is formed by an earthen berm surmounted by a set of tracks. The track is elevated on a bed of crushed rock ballast.

L4. Dimensions: (In feet for historic features and meters for prehistoric features)
a. **Top Width** 60 feet (typical)
b. **Bottom Width** 166 feet (typical)
c. **Height or Depth** 10 feet (typical)
d. **Length of Segment** 8 miles

L4e. Sketch of Cross-Section (include scale) **Facing:**

L5. Associated Resources:
None.

Setting: (Describe natural features, landscape characteristics, slope, etc., as appropriate.)
ıe surrounding terrain is naturally floodplain associated with the Sacramento River, but is now mostly urban/industrial and residential.

L7. Integrity Considerations:
This segment of the railroad has been maintained and rebuilt since original construction. Other than location, the railroad does not appear to retain any other integrity.

L8a. Photograph, Map or Drawing

L8b. Description of Photo, Map, or Drawing (View, scale, etc.)
Photo. view facing west from Hillcrest Road in Antioch.

L9. Remarks:
None

L10. Form Prepared by: (Name, affiliation, and address)
Barry G. Scott
Jones & Stokes Associates
2600 V Street, Sacramento, CA

L11. Date: April 15, 1999

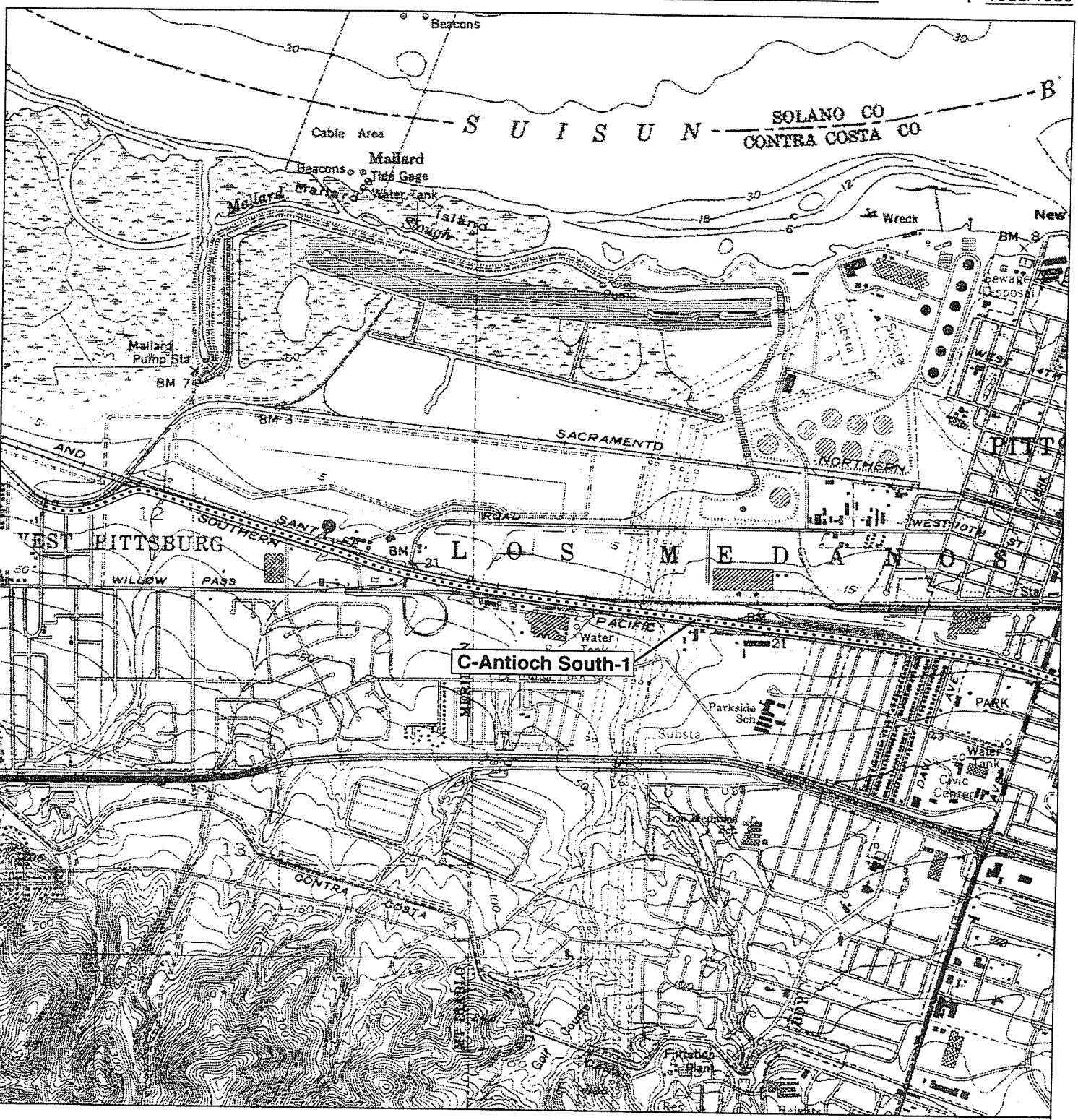
State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # P-07-002568
HRI #
Trinomial CA-CCO-749H

Resource Name or #: C-Antioch South-1

*Map Name: Honker Bay, California *Scale: 1:24,000 (1"=2,000') *Date of Map: 1953/1980



DPR 523J (1/95)

*Required information

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # P-07-002568
HRI #
Trinomial CA-CCO-749H

*source Name or #: C-Antioch South-1

*Map Name: Honker Bay, Antioch North, & Antioch South, CA *Scale: 1:24,000 (1"=2,000') *Date of Map: 1953/1980

Base map: USGS 7.5'-series quadrangles
Honker Bay (1953, PR 1980), Antioch North (1953, PR 1980), and Antioch South (1953, PR 1980), California

DPR 523J (1/95)

*Required information

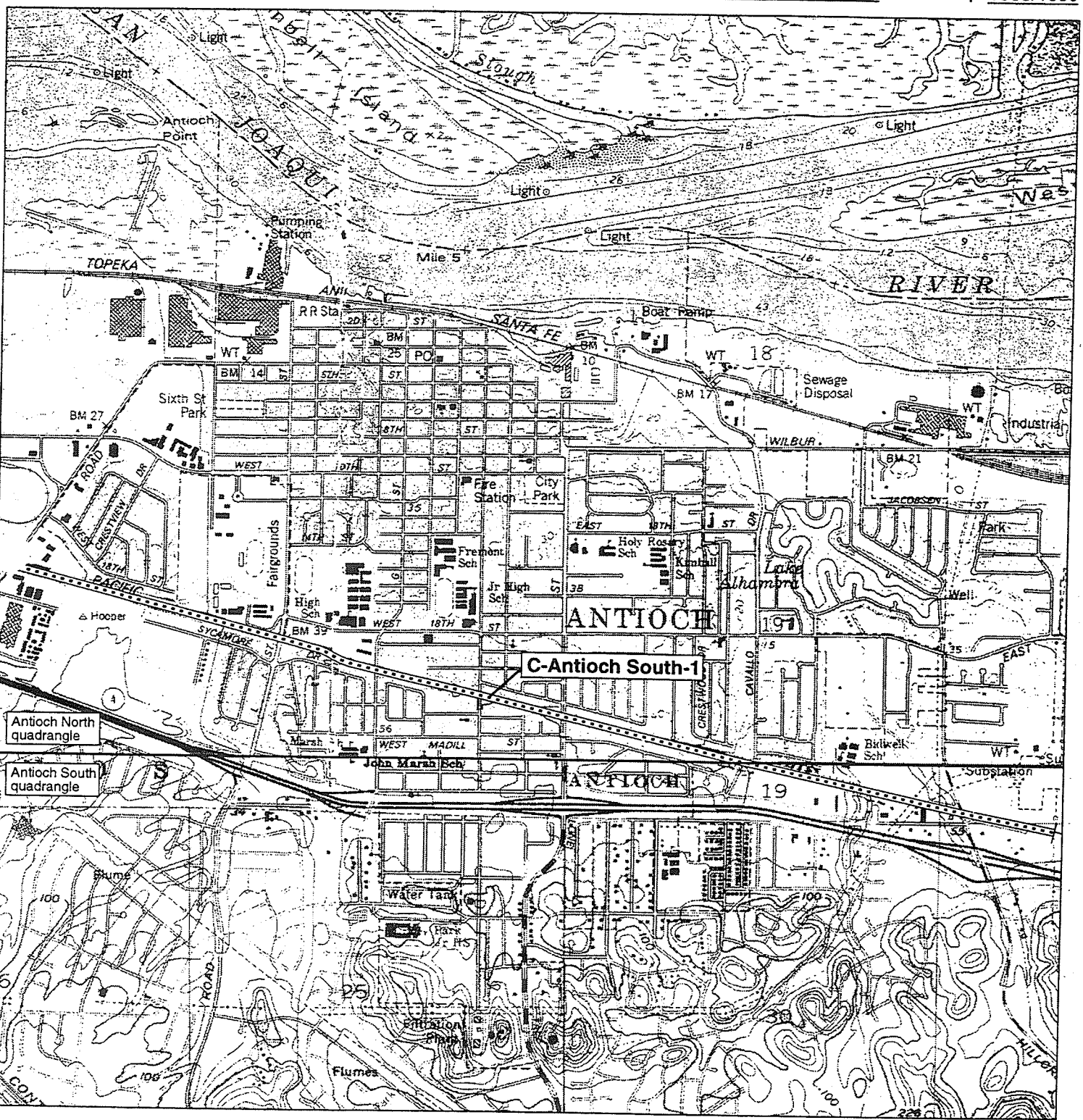
State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # P-07-002568
HRI #
Trinomial CA-CCO-749H

*Resource Name or #: C-Antioch South-1

*Map Name: Antioch North and Antioch South, California *Scale: 1:24,000 (1"=2,000') *Date of Map: 1953/1980



Base map: USGS 7.5'-series quadrangles Antioch North (1953, PR 1980), and Antioch South (1953, PR 1980), California

*Required information

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 3S
Other Listings
Review Code Reviewer Date

Page 1 of 10 *Resource Name or #: (Assigned by recorder) 435 23rd Street

P1. Other Identifier: Western Sugar Refinery Warehouses
P2. Location: ☐ Not for Publication ☒ Unrestricted *a: County San Francisco
and (P2c,P2e, and P2b or P2d. Attach Location Map as necessary.)
*b. USGS 7.5' Quad San Francisco North Date 1993 T 2S ; R 5W ; unsectioned Sec ; Mt. Diablo B.M.
c. Address 435 23rd Street City San Francisco Zip 94107
d. UTM: (Give more than one for large and/or linear resources) Zone ____; _____ mE/ _____ mN
*e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
APN 4232-10

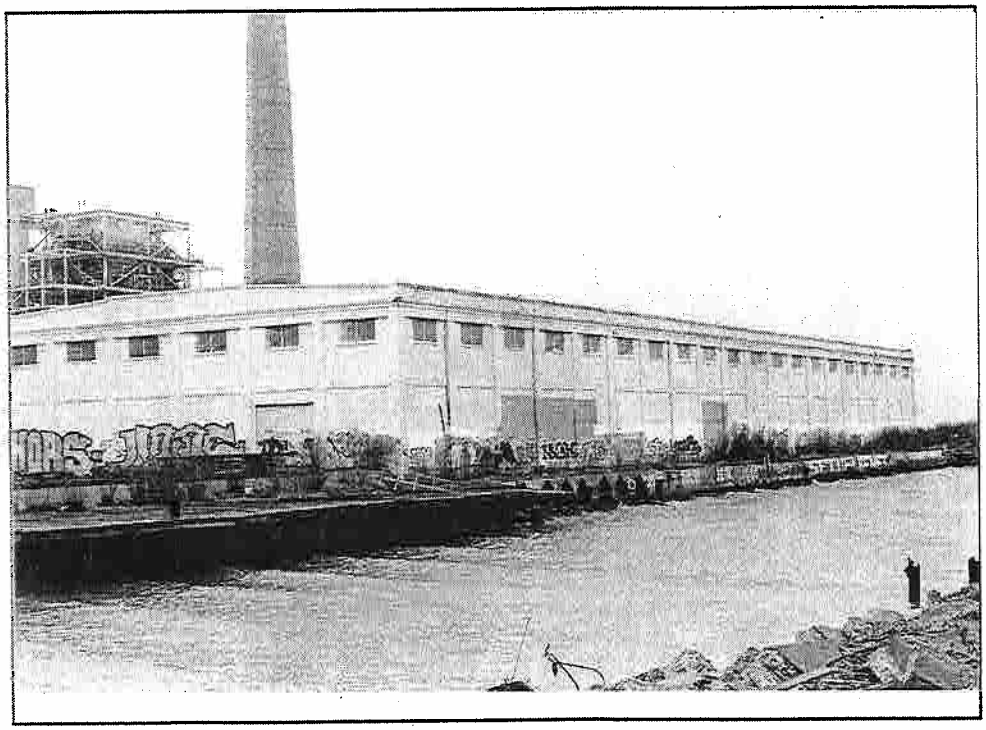
***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Assessor's Parcel 4232-10 is bounded by 23rd Street on the north, the San Francisco Bay on the east, the San Francisco Bay and 24th Street on the south, and Illinois Avenue on the west. There are three buildings on this parcel. The first (westernmost) building — 535 23rd Street — is a warehouse that was built post-1961. The next two buildings are warehouses. The warehouses are large structures built on the same east-west axis, with the earlier, 1923 building farther to the east than the 1929 building. They are located on made land with San Francisco Bay to the east and south. These buildings are described below.

1. **1923 Warehouse.** This is a large rectangular building for which construction photographs (27 November 1922 to 1 October 1923) reveal its structural design. The building was erected with a steel frame on a reinforced concrete foundation. The frame is 6 bays wide by 20 bays long with three parallel roof trusses, a central row of columns, and a central firewall. Once the frame was complete, the building and its framing members were enclosed by reinforced concrete. The building encloses a single space, 36 feet high at the walls. Steel sash windows at the top of each bay light the interior.

See continuation sheet

***P3b Resource Attributes:** (List attributes and codes) HP8 Industrial Building
***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (isolates, etc.)



P5b. Description of Photo: (View, date, accession #) 1923 Warehouse at 435 23rd Street, view to NE of S and W sides; by B. Vahey on 1-9-01; Roll BRV 3, Neg. 17

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1923 *Edwards Abstracts*
1929 *Edwards Abstracts*

***P7. Owner and Address:**
1923 Warehouse: SF MUNI, 401 Van Ness Ave, SF, CA
1929 Warehouse: HMR Global Recycling, 435 23rd Street, SF, CA

***P8. Recorded by:** (Name, affiliation, and address)
Michael Corbett, URS Corp.
221 Main Street, #600
San Francisco, CA 94105

***P9. Date Recorded:** 25 Jan 2001
***P10. Survey Type:** (Describe)
Intensive

P11. Report Citation*: (Cite survey report and other sources, or enter "none".) Application for Certification for Potrero Power Plant Unit 7 Project

***Attachments:** ☐ NONE ☒ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record
☐ Artifact Record ☐ Photograph Record ☐ Other (List)

Description (continued)

2. **1929 Warehouse.** This is a large rectangular building for which construction photographs (14 August 1929 to 12 May 1930) reveal its structural design. The lower floor is a reinforced concrete structure with articulated posts and beams. The tops of the piers are treated like Gothic buttresses. Above this, a steel frame was erected thirty-two feet high. This frame was enclosed by a reinforced concrete wall with its frame defining 8 bays on its ends and 16 bays on its sides. It is covered by a shallow gabled roof. Iron canopies originally covered loading docks on three sides. The canopy on the west end has been replaced by a new canopy since 1991. The canopy on the south side covers a rail spur. The interior is lit by steel sash windows. Inside, the lower level was used for preparing refined sugar for market (1933 photographs show women in white uniforms cutting sugar into cubes). The upper level was generally a single high open space, except at the west end which housed a mezzanine. This space is divided in the center by a fire wall.

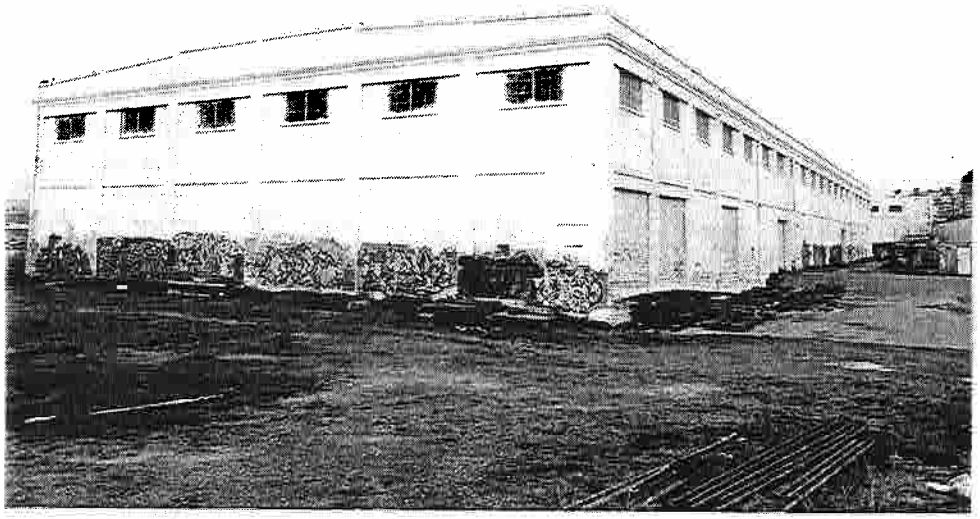


Photo 2) 1923 Warehouse at 435 23rd Street, view to W of east and north sides; by Brian Vahey on 1-9-01; Roll BRV 2, Neg. 25A

P5a. Photo or Drawing (continued)

Photo 3) 1923 Warehouse at 435 23rd Street, view to SE closeup of west and north sides; by Brian Vahey on 1-9-01; Roll BRV 2, Neg. 28A

Photo 4) 1929 Warehouse at 435 23rd Street, view to SE of west and north elevations; by Brian Vahey on 1-9-01; Roll BRV 3, Neg. 19

P5a. Photo or Drawing (continued)

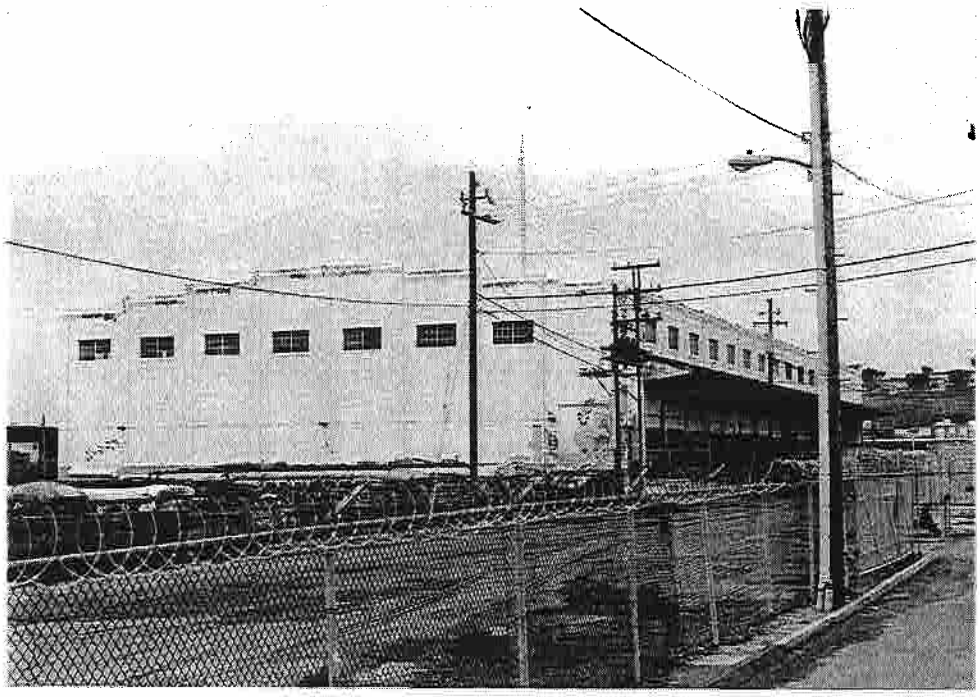


Photo 5) 1929 Warehouse at 435 23rd Street, view to W of north and east elevations; by Brian Vahey on 1-9-01; Roll BRV 2, Neg. 22A

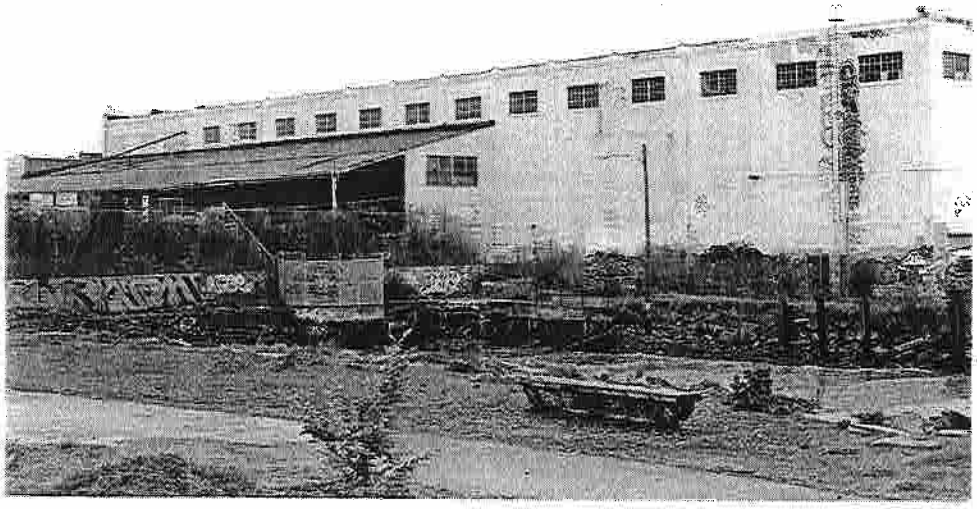


Photo 6) 1929 Warehouse at 435 23rd Street, view to NW of south elevation; by Brian Vahey on 1-9-01; Roll BRV 3, Neg. 18

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary #
HRI #

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRHP Status Code 3S

*Resource Name or # (Assigned by recorder) 435 23rd Street

B1. Historic Name: Western Sugar Refinery
B2. Common Name:
B3. Original Use: Warehouses B4. Present Use: Warehouses
*B5. Architectural Style: 1923 Warehouse: Classical; 1929 Warehouse: Gothic
*B6. Construction History: (Construction date, alterations, and date of alterations)
"1923" Warehouse: built in 1923
"1929" Warehouse built in 1929, canopy on west end replaced in 1991

*B7. Moved? ☒ No ☐ Yes ☐ Unknown Date: Original Location:
*B8. Related Features:

B9a. Architect: b. Builder:
*B10. Significance: Theme Sugar Industry Area San Francisco
Period of Significance 1923 Warehouse:1923-1948; 1929 Warehouse: 1929-1948
Property Type warehouse Applicable Criteria A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

History
Sugar Industry

Sugar is produced from two crops — sugar cane and sugar beets. The sugar industry in California began in 1856 with the first attempts to refine sugar cane from Hawaii in San Francisco. In 1870, the first efforts were made to produce sugar from locally grown sugar beets in Alvarado, Alameda County. After difficult beginnings, both industries prospered. Sugar beet companies have been generally devoted exclusively to production from sugar beets while sugar cane companies have refined sugar from both sources. In a history of San Francisco from 1865 to 1932, Issel and Cherny summarized the significance of the sugar industry to the city:

> Something of a local success story, the sugar-refining business (estimated at $17 million in 1890) owed much of its success to the efforts of Claus Spreckels, who as president of the California Sugar Refinery brought a "renaissance" to the business. Spreckels established his first refinery in 1863 at the corner of Brannan and Eight streets, and by 1884 his huge works in the Potrero District could be described as "the most complete concern of the kind in the world, and in size ranks with the great refineries of Brooklyn, New York and St. Louis." One of the three giants that controlled the nation's sugar business in the nineties, Spreckel's products dominated "the entire trade of the region." No other single manufacturing industry could match sugar refining in value of products.
> (Issel and Cherny p. 25-26)

See continuation sheet

B11. Additional Resource Attributes: (List attributes and codes)
*B12. References:

See continuation sheet.

B13. Remarks:

(Sketch map with north arrow required)

*B14. Evaluator: Michael Corbett, architectural historian
Date of Evaluation: 25 January 2001

(This space reserved for official comments)

History (continued)

Until the 1890s, sugar cane was only refined by the companies of Claus Spreckels, all of them in San Francisco. Spreckels' first refinery in 1863 was called the Bay Sugar Refining Company, followed by the American Sugar Refinery. In 1867, he established the California Sugar Refinery with its plant at 8th and Brannan streets. In 1881, he built a new and larger plant at the foot of 23rd Street on San Francisco Bay. By 1894, if not before, this plant was listed in city directories under two names — the California Sugar Refinery and the Western Sugar Refinery. When this plant was established, like many industrial plants of the time, it included facilities for workers to ensure a stable, 24-hour work-force. Like a company town, it included residences, hotels, recreation facilities, and various other non-factory buildings.

In 1894, the classified section of the city directory listed seven sugar refineries in San Francisco. Two of these listings were the two names of Spreckel's companies, the California Sugar Refinery and the Western Sugar Refinery. One of these, the Hawaiian Commercial and Sugar Company was an administrative and sales office only for a company whose other facilities — mills that produced raw, unrefined sugar — were all in Hawaii. The remaining four listings were all administrative and sales offices for sugar beet companies whose facilities were scattered over a large area in central California.

Spreckels experimented with sugar beets in Santa Cruz County in the 1870s and built a small refinery in Capitola. In 1886, after political difficulties in Hawaii threatened his supply of sugar cane, Spreckels built up his sugar beet business and built a large plant at Watsonville. By 1888, this was called the Western Beet Sugar Company, "the largest beet sugar factory in the United States." This factory produced raw sugar which was sent to his San Francisco plant to be refined. A new factory which also produced refined beet sugar in the company town of Spreckels in Monterey County began operating in 1899. This was the largest sugar beet factory in the world.

The development of the California sugar cane industry had been boosted by the Reciprocity Treaty of 1877, which removed tariffs from sugar entering the United States. When Hawaii was annexed and the Philippines were taken from Spain in 1898, the potential for sugar cane imports was improved again. This provided an opportunity for the first competition to Spreckels in the sugar cane refining business. In that year, the California Beet Sugar and Refining Company took over the Starr Flour Mill in Crockett, at the mouth of the Carquinez Strait. Because sugar beets were not grown successfully nearby, this effort failed, and the plant was taken over and remodeled by the Sugar Factors Company. In 1906, this became the Californian and Hawaiian Sugar Refinery Corporation (C and H Sugar), under the leadership of George M. Rolph.

By the 1920s, C and H Sugar was as big as the Western Sugar Refinery of Claus Spreckels' heirs, his sons J.D. and A.B. Spreckels. Both companies owned sugar plantations in Hawaii and controlled shipping lines. Both were continually modernizing their plants. In the 1910s and 1920s, C and H Sugar built an enormous expansion to its plant. In 1915, 1923, and 1929, Western made comparable improvements in the construction of new buildings that made a more modern process possible. These warehouses appear to have been at least partly built to improve storage conditions over those in the existing wood warehouses. Photographs taken along with construction photographs of these buildings show sacks of sugar in wood warehouses that appear broken and soiled. According to a standard handbook on the handling and storage of cargo (Ford, p. 282-284), "Sugar is one of the most difficult commodities to handle." It must be kept dry. Reinforced concrete buildings represented a major improvement over brick or wood in making clean and dry conditions possible. The two companies produced table sugar under the rival brand names of C &H "Pure Cane Sugar," and Western's "Sea Island Sugar."

According to the *San Francisco Chronicle* (15 April 1949), in August 1948, the Spreckels Company "withdrew from sugar refining" and closed its plant. In April 1949, the plant was purchased by C and H for $3,780,000. The company signed contracts with Local 6 of the ILWU and planned to employ 500 workers, in addition to 2,000 workers at its Crockett plant. Because of a longshoremans' strike in Hawaii in the same month the plant was sold, it did not reopen. According to the *Chronicle* (12 April 1950), "some of the machinery and equipment" were to be moved to Crockett, and the land was to be "disposed of for other industrial uses."

At the time the plant closed, it was a large complex of 19th and 20th century buildings fully covering a site that was over four blocks long from east to west and over two blocks wide from north to south. In 1950, there were at least sixteen buildings, two large water tanks, a fuel tank, wharves, railspurs, and roadways. The buildings were all connected to one another either because their walls butted and passages were cut through, or via overhead bridges and conveyors. The buildings included a 9-story brick structure (pre-1914, purpose unknown), a 7-story brick melt wash house (pre-1914), a 5-story brick melt filter house (pre-1914), seven large one-story wood raw sugar warehouses built in two connecting rows (pre-1914), the covered East Wharf and Raw Sugar Dock (pre-1914),

History (continued)

a 2-story brick structure built was a refined sugar warehouse (pre-1914), a 10-story reinforced concrete refinery building (1915), a large steel and concrete warehouse (1923), and a large steel and concrete warehouse (1929).

The refining process is not known apart from what can be deduced from Sanborn maps. Raw sugar was delivered to the east wharf by ship from Hawaii. It was stored in the adjacent raw sugar warehouse (pre-1914 wood structures and 1923 steel and concrete structure) until it entered the refining process in the complex of buildings on the north side of 23rd Street, beginning with the melt wash house and the melt filter house. When the refining process was complete, it was delivered by conveyor to the south side of 23rd Street, first to the old brick refined sugar warehouse. From there it was taken by conveyor to the 1929 concrete and steel warehouse for packaging. From that warehouse, it could be distributed by rail and truck to markets.

Photographs at the Bancroft Library show most of the pre-1914 brick buildings of the plant being demolished in 1950. By 1975, only the 10-story 1915 sugar building was left standing on the north side of 23rd Street.

On the south side of 23rd Street, only the 1923 and 1929 warehouses were still standing. At an unknown date prior to that time the warehouses were occupied by the Walkup Drayage and Warehouse Company, whose abbreviation (W.D. & W'ho. Co.) remained on the Sanborn maps as late as 1991. On the 1978 Sanborn map, the 1923 warehouse was occupied by National Wine and Liquor Importing Company, and the 1929 warehouse was occupied by Nielson Freight Lines. Nielson Freight was replaced by Boland Trucking Company between 1987 and 1989. Today, the 1923 warehouse is owned by San Francisco Municipal Railway (MUNI) and is used for storage. The 1929 warehouse is the location of the HMR Global Recycling facility.

Evaluation

The 1923 and 1929 warehouses of the Western Sugar Refinery appear eligible for the NRHP under criterion A and the CRHR under criteria 1 at the local level of significance. The period of significance for the 1923 warehouse is 1923, when it was built, through 1948, when Western Sugar Refinery ended its operations in San Francisco. The period of significance for the 1929 warehouse is 1929, when it was built, through 1948, when Western Sugar Refinery ended its operations in San Francisco.

These warehouses are the last structures left from the Western Sugar Refinery which operated at this site from 1881 to 1948. These warehouses represent the once powerful sugar industry in San Francisco. While many sugar companies had headquarters in San Francisco, the Western Sugar Refinery was the only one with operations in San Francisco. These buildings are also associated with the Spreckels family, which owned the sugar company privately; and are part of the wide ranging business interests of that family. They also represent the long-time ties of San Francisco's economy with Hawaii.

These buildings are little altered and possess integrity of location, design, workmanship, materials, and association. A few windows have been walled up and the west end of the 1929 building has been altered by the removal of the original awning, replacement of original steel sash windows with aluminum sash, and painted signs. These are minor changes and do not substantially detract from the character of the building or from the features associated with its significance. By the loss of the rest of the plant there is a substantial loss of integrity of setting and feeling.

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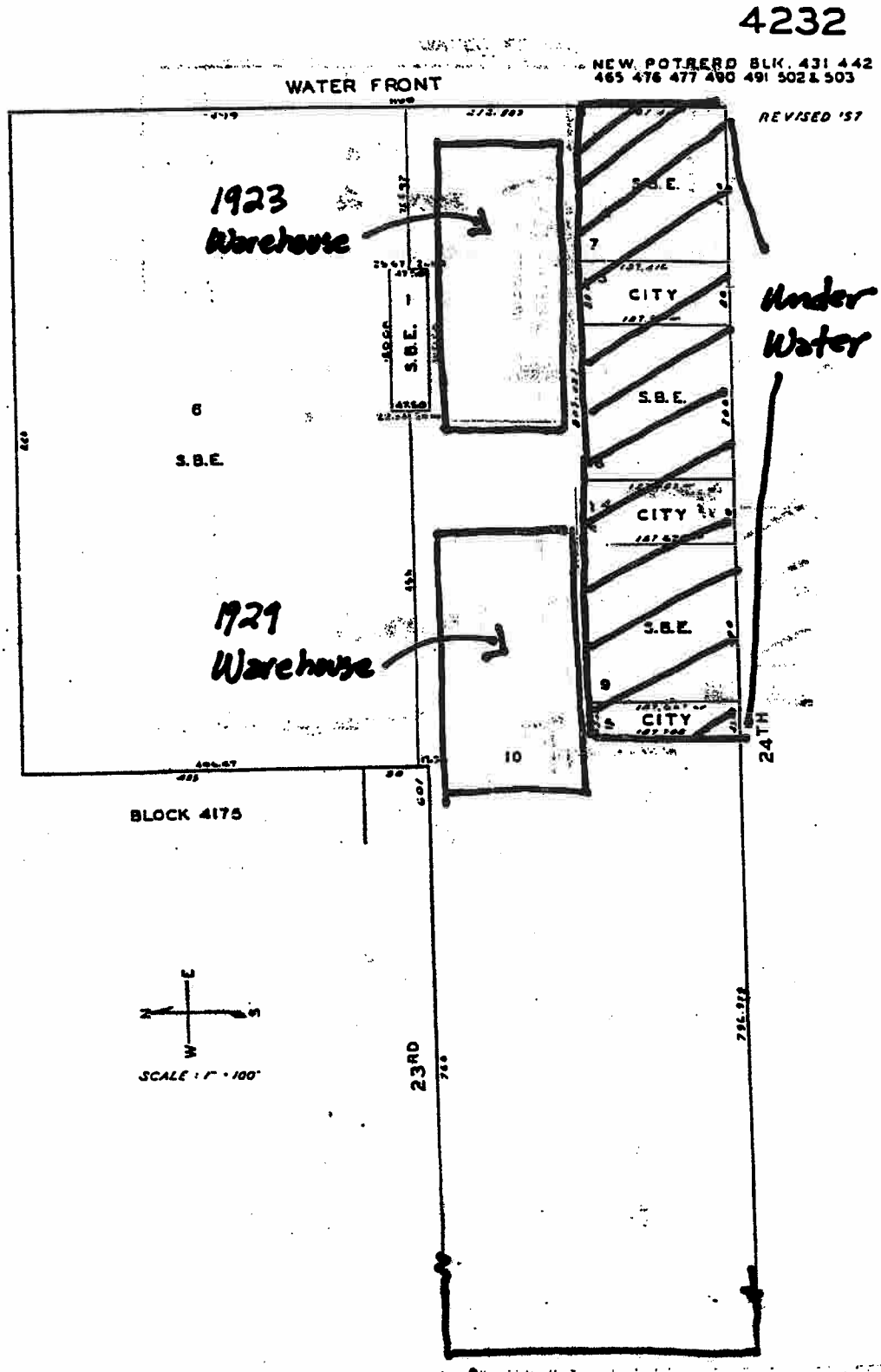
State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

Page 10 of 10 *Resource Name or # (Assigned by recorder) 435 23rd Street
Map Name: San Francisco Assessor's Parcel Map *Scale: Dimensions on Map *Date of Map: current



State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

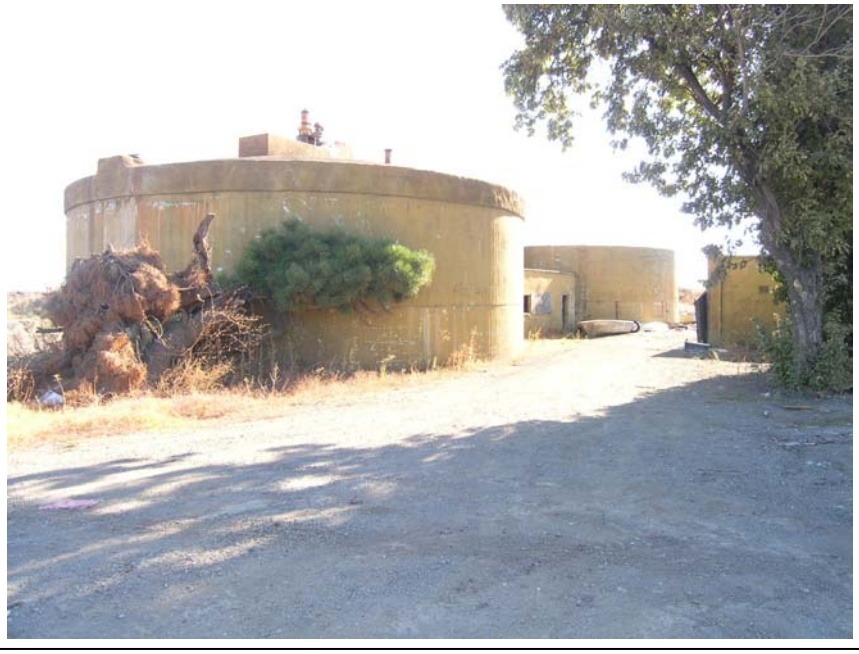
Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

***Resource Name** - Standard Oil Site

P1. Other Identifier: Parcel east of Loveridge and north of former Southern Pacific Railroad
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County:** Contra Costa
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Antioch North **Date** 1953 **T** 2N; **R** 1E; __ ¼ **of Sec** ___; M.D.B.M.
c. Address 1301 Standard Oil Avenue City Pittsburg Zip 94565
d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
APN-073-230-007-4

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
Several buildings and structures are located at the center of this 7.5 acre parcel and are described on this form as Feature A through F, with Feature A being the northernmost. Feature A consists of two large, cylindrical, board-formed concrete sewage treatment tanks connected by a one-story concrete pump house that is partially below grade (Photographs 1 - 4). The western tank has a slightly domed roof covered in stucco; exposed equipment protrudes from the apex of this roof. The top of the eastern tank is not visible, but appears to be a flat parapet roof. Building B is located just to the south of the tanks and is a single-story, rectangular building with stucco siding and a flat roof. It has sliding exterior-mounted plywood doors on the north side and all other doors and windows have been removed or are covered with plywood panels. There are two additions, both wood-framed and flat-roofed, on Building B: one along the east side of the building and one across the south side (Photographs 4 and 5). (See Continuation Sheet)

***P3b. Resource Attributes:** (List attributes and codes) (HP34) Military; (HP11) Engineering structure
***P4. Resources Present:** ☒ Building ☒Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1, view northeast, September 19, 2005

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
Ca 1940-1944; served Camp Stoneman, Goodwin, et al., May 1995,

***P7. Owner and Address:**
City of Pittsburg
2020 Railroad Avenue
Pittsburg, CA 94565

***P8. Recorded by:** (Name, affiliation, address)
Meta Bunse
JRP Historical Consulting,
1490 Drew Ave, Suite 110,
Davis, CA 95616

***P9. Date Recorded:** September 19, 2005
***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** Inventory and Evaluation, Historic Architectural Resources, Trans Bay Cable Project, 2005.
***Attachments:** ☐ None ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record
☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record
☐ Other (list) _____

B1. Historic Name: sewage treatment plant, Camp Stoneman
B2. Common Name: _____
B3. Original Use: sewage treatment B4. Present Use: vacant
***B5. Architectural Style:** utilitarian
***B6. Construction History:** (Construction date, alteration, and date of alterations) Concrete tanks and nearby ancillary building (Building B), ca. 1940-1944; remaining features ca. 1960s and later.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** _____ **Original Location:**
***B8. Related Features:** concrete slab foundation; metal tanks; trailers

B9. Architect: unknown b. Builder: unkown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The complex does not appear to meet the criteria for listing in the National Register of Historic Places, nor is it an historical resource for the purposes of CEQA. Two of the buildings date to the early 1940s and are associated with Camp Stoneman, a large U.S. Army facility that was constructed south of the Southern Pacific rail line and Pittsburg during the first years of World War II. It served as the San Francisco Port of Embarkation's primary troop staging center. From 1942 to its closure in 1954, Camp Stoneman processed over one million soldiers disembarking to the Pacific Theater during World War II and the Korean War. (See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes) former automotive salvage yard; HP6, Commercial 1-3 stories

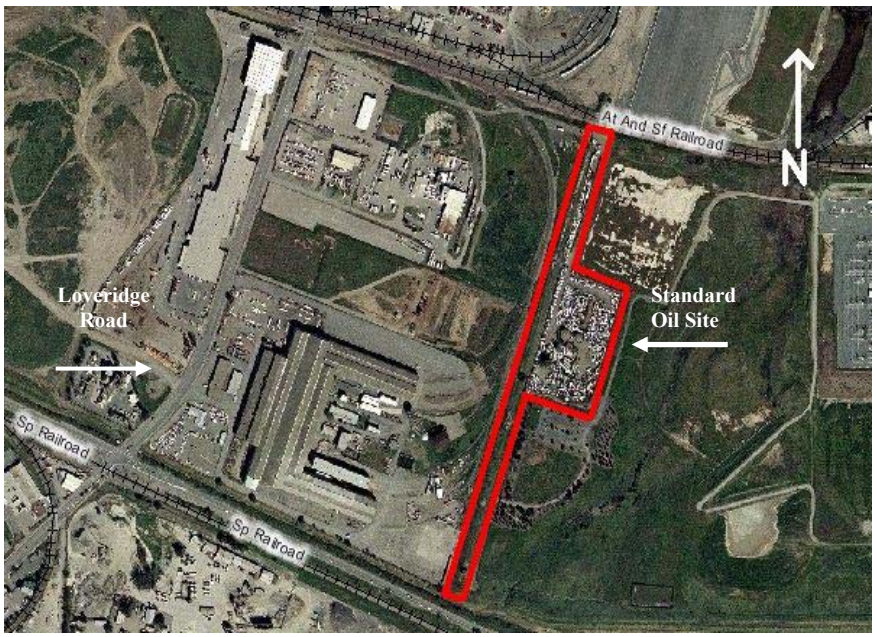
***B12. References:** Contra Costa County Property Records; USGS 7.5' *Antioch North* Topographic Map, 1953, 1980; Polk's Pittsburg-Antioch City Directory, various from 1949-1978; Maps from Contra Costa County Assessors web site; R. Christopher Goodwin & Associates, Inc., "Support and Utility Structures and Facilities (1917-1946), Overview, Inventory, and Treatment Plan," prepared for Department of the Navy, Atlantic Division, May 1995; US Army, *San Francisco Port of Embarkation*, ca. 1947; see footnotes.

B13. Remarks:

***B14. Evaluator:** Meta Bunse

***Date of Evaluation:** November 10, 2005

(This space reserved for official comments.)



P3a. Description (continued):

Building C is a prefabricated building located southeast of Building B. Building C has a rectangular footprint and a low-pitched, shed roof, with slightly overhanging eaves. The walls are clad in wood panel siding (Photograph 6). Building D is the southernmost building of the group and it is a wood-framed garage with a flat roof, poured concrete slab floor, and plywood siding (Photograph 7). It has two bays, one on the west side and one on the south side, neither has a door. A flat-roofed addition that is shorter than the main garage extends from the east side of the building. Features E and F are not buildings, but are cylindrical metal tanks and a concrete slab located east of Building D (Photograph 8).

B10. Significance (continued):

Most troops arrived via troop trains, on both the AT&SF and Southern Pacific, which both constructed spur lines to service the camp.[1] At peak capacity, Camp Stoneman could accommodate 20,000 troops at a time, with an average two week stay for each soldier. The camp employed hundreds of local citizens in addition to military staffing to handle this massive influx of troops and equipment and, along with all the other buildings and infrastructure of this post, the Army built a sewage treatment facility to serve the camp.[2]

Buildings A and B located on the parcel evaluated on this form are the remains of that treatment facility. Nearly all other elements of the camp have been removed or razed.[3] In 1954, shortly after the end of the Korean War, Camp Stoneman was decommissioned and its land and buildings were sold to private owners. By the mid-1960s, many of the buildings had been dismantled or destroyed, although some were converted to commercial uses such as Camp Stoneman Industrial Park south of State Route 4 on Harbor Court. The parcel of land containing the sewage treatment facility (including Buildings A and B), however, was not sold to private owners. The City of Pittsburg assumed title and least three other buildings were built on the parcel during this time, although only two of the more recent buildings remain; all of the remaining buildings on the parcel are in disrepair and most have been substantially altered. For many years an automotive salvage yard operated on this site.

None of the buildings on the parcel appear eligible for the National Register or California Register because they are not historically or architecturally significant, and because they lack integrity. The sewage treatment plant was

[1] Don L. Hofsommer, *The Southern Pacific: 1901-1985* (College Station: Texas A&M University Press, 1986); Heath, *Seventy-Five Years of Progress*, 44-50.

[2] JRP Historical Consulting, "Historical Resources Evaluation Report, State Route 4 (e) Widening Project, Loveridge Road to State Route 160, Contra Costa County, California, P.M. 23.5/25.8," prepared for Parsons Transportation Group, September 2002; R. Christopher Goodwin & Associates, Inc., "Support and Utility Structures and Facilities (1917-1946), Overview, Inventory, and Treatment Plan," prepared for Department of the Navy, Atlantic Division, May 1995; US Army, *San Francisco Port of Embarkation*, ca. 1947; Nilda Rego, "Pittsburg dismayed by Stoneman's final orders," *Contra Costa Times*, 26 April 1997; California State Military Department, "Historic California Posts: Camp Stoneman," accessed at http://www.militarymuseum.org/CpStoneman.html on September 22, 2005.

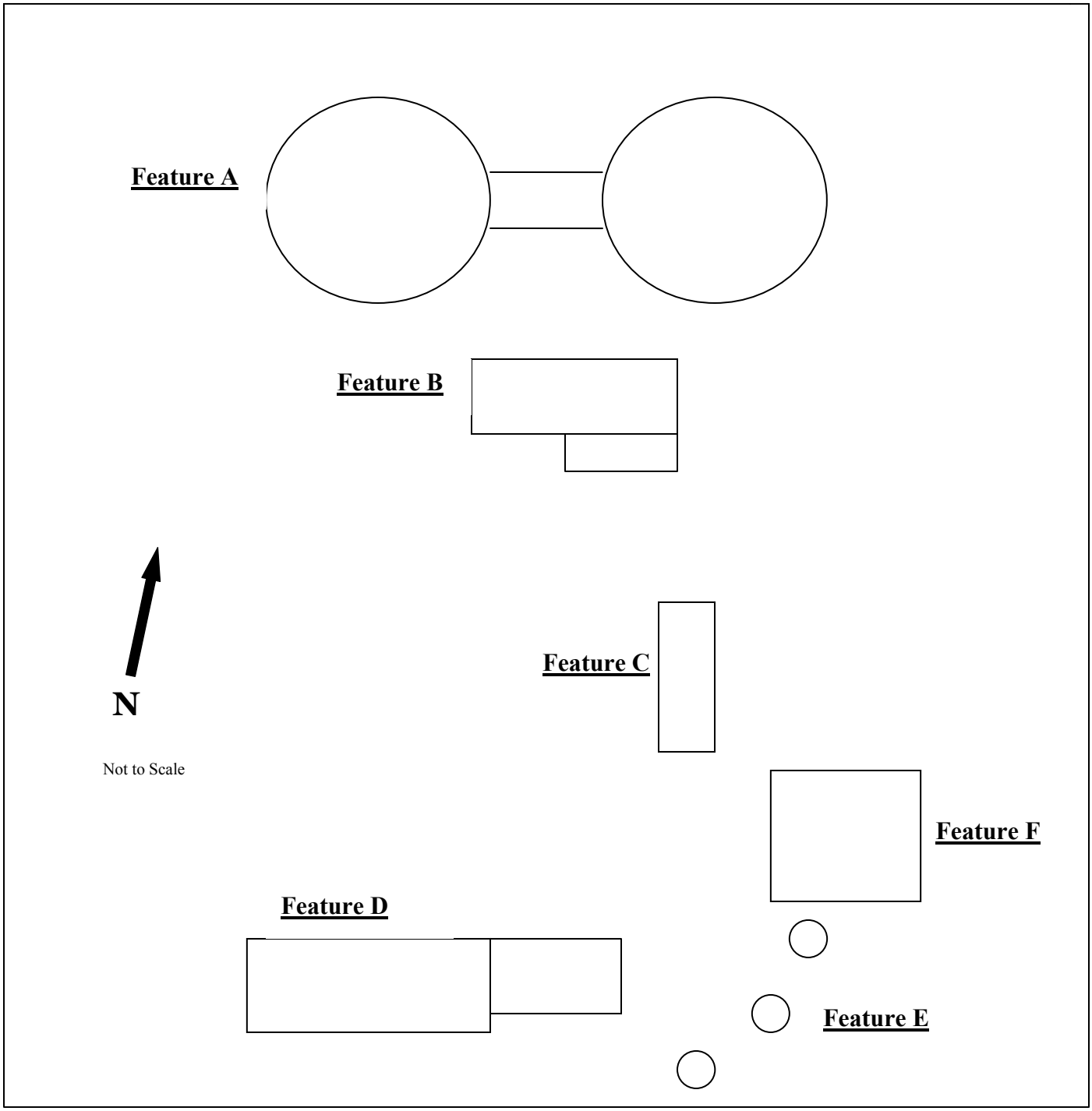
[3] JRP Historical Consulting, "Historical Resources Evaluation Report, State Route 4 (e) Widening Project, Loveridge Road to State Route 160, Contra Costa County, California, P.M. 23.5/25.8," prepared for Parsons Transportation Group, September 2002; R. Christopher Goodwin & Associates, Inc., "Support and Utility Structures and Facilities (1917-1946), Overview, Inventory, and Treatment Plan," prepared for Department of the Navy, Atlantic Division, May 1995; US Army, *San Francisco Port of Embarkation*, ca. 1947.

part of the infrastructure necessary for the operation of Camp Stoneman playing a practical role in support of the overall mission of the installation. This routine function does not have important specific association with an event or pattern of events, either in the history of Camp Stoneman, or the broader contexts of World War II, Korean War, or military history (Criterion A).[4] None of the other buildings and structures (Buildings C, D, E, and F) demonstrate associations with events significant to the history of the area following its transfer to the City of Pittsburg after Camp Stoneman was decommissioned. Available evidence does not indicate that the buildings were associated with any known significant persons (Criterion B). Furthermore, none of the buildings appear eligible under Criterion C. The two remaining tanks were once part of a much larger facility that included at least to other tanks, as well as settling ponds and other equipment, as do not retain integrity as originally designed. The other utilitarian, wood-frame, one-story buildings are small and unremarkable and have been altered over the years.[5] These structures do not embody distinctive architectural or engineering qualities of a type, period, or method of construction under Criterion C. Finally, the resource has not yielded, nor is likely to yield, information important in prehistory or history (Criterion D). This property has also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code and does not appear to meet the significance criteria as outlined in these guidelines.

[4] R. Christopher Goodwin & Associates, Inc., "Support and Utility Structures and Facilities (1917-1946), Overview, Inventory, and Treatment Plan," prepared for Department of the Navy, Atlantic Division, May 1995, 286.

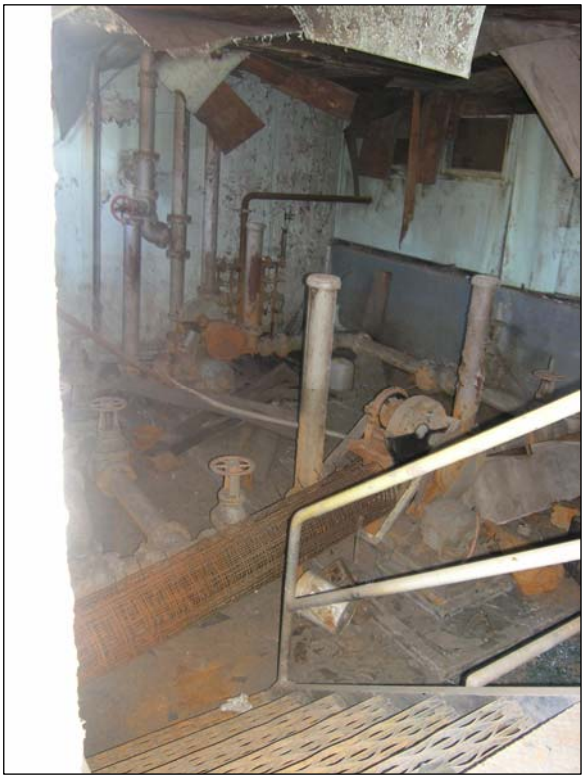
[5] Goodwin & Associates, "Support and Utility Structures and Facilities (1917-1946)," 58.

Site Sketch:


Feature A
Feature B
N
Not to Scale
Feature C
Feature F
Feature D
Feature E

Photographs (cont):

Photograph 2. Building A, pump house connecting the tanks, view northwest.



Photograph 3. Interior of pump house, Building A.

Photographs (cont):

Photograph 4. Buildings A and B, view northwest.

Photograph 5. Building B, view southeast.

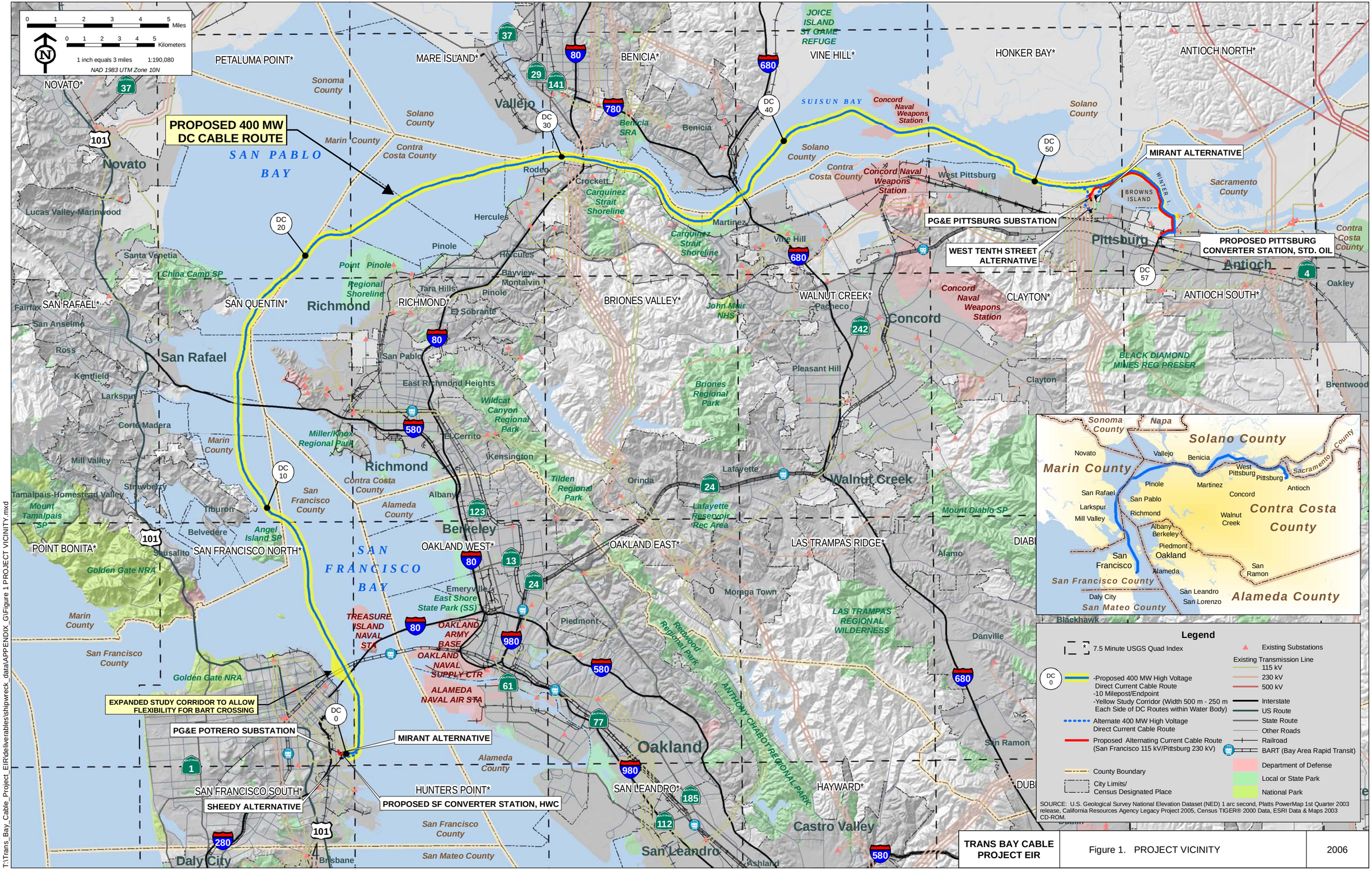
Photographs (cont):

Photograph 6. Building C, view northeast.

Photograph 7. Building D, view northeast.

Photographs (cont):

Photograph 8. Features E and F, view southwest.



T:\Trans_Bay_Cable_Project_EIR\deliverables\shipwreck_data\APPENDIX_G\Figure 1 PROJECT VICINITY.mxd

TRANS BAY CABLE PROJECT EIR	Figure 1. PROJECT VICINITY	2006

0 1 2 3 4 5 Miles
0 1 2 3 4 5 Kilometers
1 inch equals 3 miles 1:190,080
NAD 1983 UTM Zone 10N

PROPOSED 400 MW DC CABLE ROUTE

Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Sheet 8
Sheet 9
Sheet 10

DC 0
DC 10
DC 20
DC 30
DC 40
DC 50
DC 57

MIRANT ALTERNATIVE
PG&E POTRERO SUBSTATION
EXPANDED STUDY CORRIDOR TO ALLOW FLEXIBILITY FOR BART CROSSING
SHEEDY ALTERNATIVE
PROPOSED SF CONVERTER STATION, HWC
PG&E PITTSBURG SUBSTATION
WEST TENTH STREET ALTERNATIVE
PROPOSED PITTSBURG CONVERTER STATION, STD. OIL

SAN FRANCISCO BAY
SAN PABLO BAY
SUISUN BAY
JOICE ISLAND ST GAME REFUGE

PETALUMA POINT* · MARE ISLAND* · BENICIA* · VINE HILL* · HONKER BAY* · ANTIOCH NORTH*
NOVATO* · Vallejo · Novato · Petaluma · Rohnert Park · Cotati · Sebastopol
Sonoma County · Solano County · Marin County · Contra Costa County · Sacramento County
Benicia SRA · Concord Naval Weapons Station · West Pittsburg · Browns Island · Winter Island
Lucas Valley-Marinwood · Santa Venetia · China Camp SP · Point Pinole Regional Shoreline
Rodeo · Crockett · Carquinez Strait Shoreline · Hercules · Pinole · Martinez · Vine Hill · Pittsburg · Antioch · Oakley
Fairfax · SAN RAFAEL* · SAN QUENTIN* · Richmond · RICHMOND* · Tara Hills · Bayview-Montalvin · El Sobrante · BRIONES VALLEY* · WALNUT CREEK* · Pacheco · Concord · CLAYTON* · ANTIOCH SOUTH*
San Anselmo · Ross · San Rafael · Kentfield · Larkspur · Corte Madera · Mill Valley · Strawberry · Tamalpais-Homestead Valley · Mount Tamalpais SP · Tiburon · Belvedere · Angel Island SP
San Pablo · East Richmond Heights · Wildcat Canyon Regional Park · Miller/Knox Regional Park · El Cerrito · Kensington · Albany · Berkeley · Tilden Regional Park · Orinda · Lafayette · Walnut Creek · Pleasant Hill · Briones Regional Park · Lafayette Reservoir Rec Area · Mount Diablo SP · Clayton · BLACK DIAMOND MINES REG PRESER · Brentwood
POINT BONITA* · Sausalito · SAN FRANCISCO NORTH* · Golden Gate NRA · Marin County · San Francisco County
OAKLAND WEST* · OAKLAND EAST* · LAS TRAMPAS RIDGE* · Alamo · Moraga Town · Emeryville · East Shore State Park (SS) · Piedmont · TREASURE ISLAND NAVAL STA · OAKLAND ARMY BASE · OAKLAND NAVAL SUPPLY DEPOT · ALAMEDA NAVAL AIR STA · LAS TRAMPAS REGIONAL WILDERNESS · Redwood Regional Park · ANTHONY CHABOT REGIONAL PARK · Danville · Blackhawk · San Ramon
Oakland · SAN LEANDRO* · HAYWARD* · Castro Valley · San Leandro · Ashland · Alameda County · San Mateo County · Brisbane · Daly City · SAN FRANCISCO SOUTH* · HUNTERS POINT*

Legend

- 7.5 Minute USGS Quad Index
- Strip Map Index
- -Proposed 400 MW High Voltage Direct Current Cable Route
  -10 Milepost/Endpoint
  -Yellow Study Corridor (Width 500 m - 250 m Each Side of DC Routes within Water Body)
- Alternate 400 MW High Voltage Direct Current Cable Route
- Proposed Alternating Current Cable Route (San Francisco 115 kV/Pittsburg 230 kV)
- County Boundary
- City Limits/ Census Designated Place
- Existing Substations
- Existing Transmission Line
  - 115 kV
  - 230 kV
  - 500 kV
- Interstate
- US Route
- State Route
- Other Roads
- Railroad
- BART (Bay Area Rapid Transit)
- Department of Defense
- Local or State Park
- National Park

SOURCE: U.S. Geological Survey National Elevation Dataset (NED) 1 arc second, Platts PowerMap 1st Quarter 2003 release, California Resources Agency Legacy Project 2005, Census TIGER® 2000 Data, ESRI Data & Maps 2003 CD-ROM.

TRANS BAY CABLE PROJECT EIR	Figure 2. STUDY AREA STRIP MAP INDEX	2006

T:\Trans_Bay_Cable_Project_EIR\deliverables\shipwreck_data\APPENDIX_G\Figure 2 STRIP MAP INDEX.mxd

DC 5

DC 4

DC 3

DC 2

DC 1

DC 0.7

Treasure Island

Yerba Buena Island

NAVAL RES

COAST GUARD RESERVATION

North Point

Rincon Point

China Basin

Central Basin

Potrero Point

Lash Lighter Basin

SAN FRANCISCO

BAY

BAR CHANNEL

TRANS-BAY TUBE

TRANSIT

(TOLL BRIDGE) SAN FRANCISCO-OAKLAND BAY BRIDGE

ISLAIS CREEK CHANNEL

EXPANDED STUDY CORRIDOR TO ALLOW FLEXIBILITY FOR BART CROSSING

ALTERNATIVE SF CONVERTER STATION, MIRANT

PG&E POTRERO SUBSTATION

AC 0.28

AC 0

DC 0

PROPOSED SF CONVERTER STATION, HWC

ALTERNATIVE SF CONVERTER STATION, SHEEDY

PROPOSED CONSTRUCTION LAYDOWN AREA (W. PACIFIC)

ALTERNATIVE CONSTRUCTION LAYDOWN AREA (PIER 94/96)

Legend

Proposed/Alternative Cable Route Mileposts

- Mile/End Point
- Tenth of a Mile

Proposed/Alternative Routes

- DC 0 — Proposed 400 MW High Voltage Direct Current Cable Route
- AC 0 — Proposed 115 kV Alternating Current Cable Route (San Francisco)
- AC 0 — Proposed 230 kV Alternating Current Cable Route (Pittsburg)
- DC 0 — Alternate 400 MW High Voltage Direct Current Cable Route
- AC 0 — Alternate 230 kV Alternating Current Cable Route (Pittsburg)
- Proposed Converter Stations
- Alternate Converter Stations
- Existing PG&E Substation
- Proposed Construction Laydown Area
- Alternative Construction Laydown Area
- Yellow Study Corridor: Width 500 m - 250 m Each Side of DC Routes within Water Body
- # — See Table A.2-1 (Red and green lines accompanied by this symbol represent land easements granted to vendors by the State of California).
- DS-# — USACE Dredge Disposal Areas

Note: Water depth will be confirmed as part of the TBC Marine Survey.

Source: U.S. Geological Survey 1:24,000-scale topographic maps (National Geographic Seamless USGS Topographic Maps on CD-ROM, Powered by TOPO!).

0 0.1 0.2 0.3 0.4 0.5 Miles

0 100 200 300 400 500 600 Meters

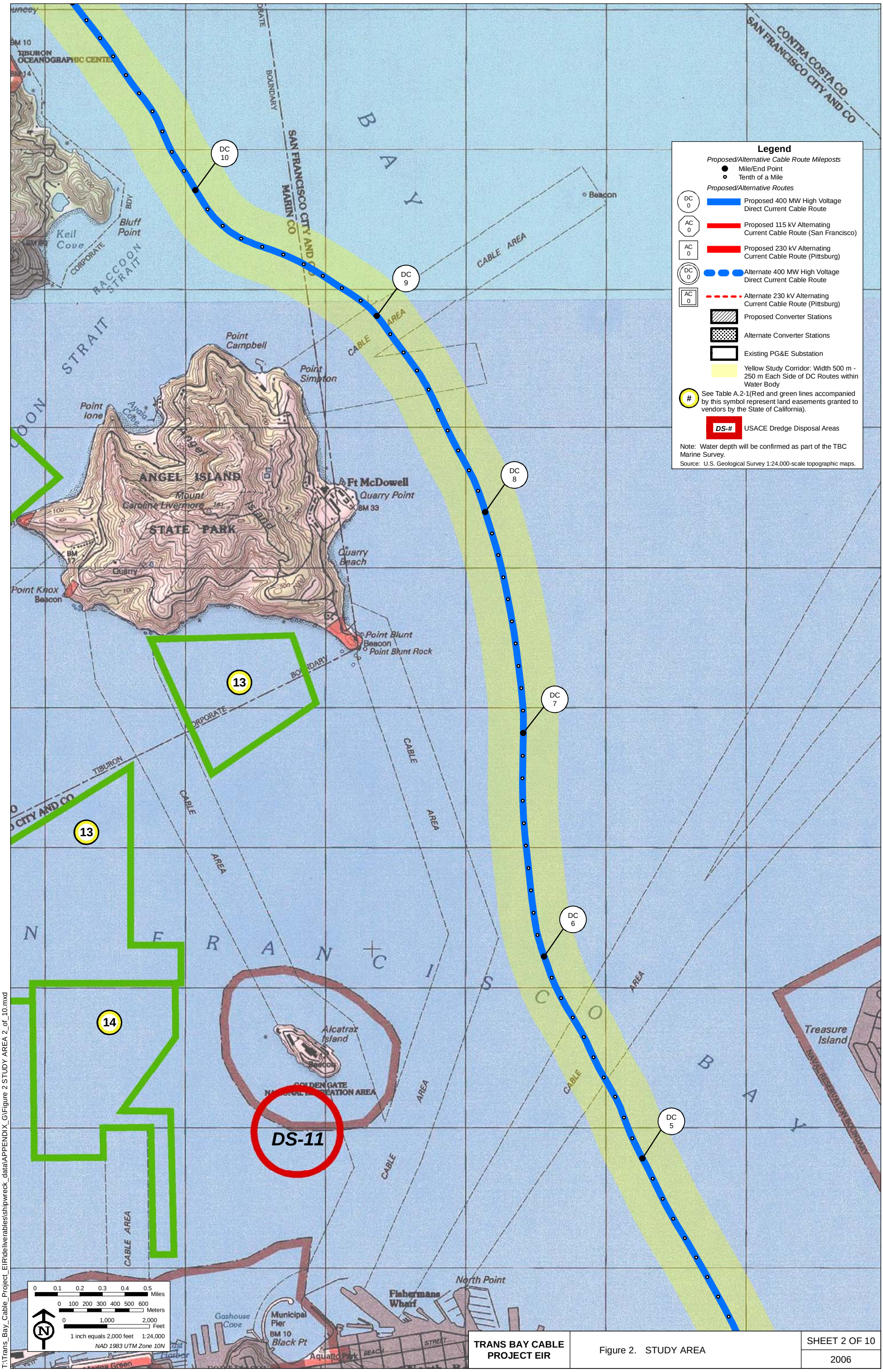
0 1,000 2,000 Feet

1 inch equals 2,000 feet 1:24,000

NAD 1983 UTM Zone 10N

T:\Trans_Bay_Cable_Project_EIR\deliverables\shipwreck_data\APPENDIX_G\Figure 2 STUDY AREA 1_of_10.mxd

TRANS BAY CABLE PROJECT EIR	Figure 2. STUDY AREA	SHEET 1 OF 10 2006



TRANS BAY CABLE PROJECT EIR	Figure 2. STUDY AREA	SHEET 2 OF 10 2006

T:\Trans_Bay_Cable_Project_EIR\deliverables\shipwreck_data\APPENDIX_G\Figure 2 STUDY AREA 2_of_10.mxd

Legend

Proposed/Alternative Cable Route Mileposts

- Mile/End Point
- Tenth of a Mile

Proposed/Alternative Routes

- DC 0 — Proposed 400 MW High Voltage Direct Current Cable Route
- AC 0 — Proposed 115 kV Alternating Current Cable Route (San Francisco)
- AC 0 — Proposed 230 kV Alternating Current Cable Route (Pittsburg)
- DC 0 — Alternate 400 MW High Voltage Direct Current Cable Route
- AC 0 — Alternate 230 kV Alternating Current Cable Route (Pittsburg)
- Proposed Converter Stations
- Alternate Converter Stations
- Existing PG&E Substation
- Yellow Study Corridor: Width 500 m - 250 m Each Side of DC Routes within Water Body
- # — See Table A.2-1 (Red and green lines accompanied by this symbol represent land easements granted to vendors by the State of California).
- DS-# — USACE Dredge Disposal Areas

Note: Water depth will be confirmed as part of the TBC Marine Survey.

Source: U.S. Geological Survey 1:24,000-scale topographic maps.

DC 16
DC 15
DC 14
DC 13
DC 12
DC 11
11
12
East Marin Island
Point San Pablo
Wreck
Pt San Pablo Yacht Harbor
The Brothers
Lighthouse
Beacon
Whiting Rock
Wreck
Point Orient
BM 11
Beacons
Invincible Rock
Point San Quentin
BM 17 Pumping Station
SAN RAFAEL
CORPORATE
CABLE
AREA
RICHMOND
SAN RAFAEL
BRIDGE
DOUBLE DECK
(TOLL)
Castro Point
Castro Rocks
Red Rock
BOUNDARY
CORPORATE
Beacons
Point Molate
FUEL SURF
Paradise Cay
El Campo
Paradise Cove
Paradise Beach County Park
Point Chauncey
BM 10
TIBURON OCEANOGRAPHIC CENTE
BM 14
BM 135
Tiburon Uplands Nature Preserve
Spring
BM 40
TIBURON
Hilarita
Wreck
SOUTHAMPTON SHOAL CHANNEL
TIBURON
SAN FRANCISCO BAY

0 0.1 0.2 0.3 0.4 0.5 Miles
0 100 200 300 400 500 600 Meters
0 1,000 2,000 Feet
1 inch equals 2,000 feet 1:24,000
NAD 1983 UTM Zone 10N

TRANS BAY CABLE PROJECT EIR	Figure 2. STUDY AREA	SHEET 3 OF 10
		2006

T:\Trans_Bay_Cable_Project_EIR\deliverables\shipwreck_data\APPENDIX_GIMap A_2-1 DETAILED PROJECT LOCATION STRIP MAP 3_of_10.mxd

Legend

Proposed/Alternative Cable Route Mileposts

- Mile/End Point
- Tenth of a Mile

Proposed/Alternative Routes

- DC 0 — Proposed 400 MW High Voltage Direct Current Cable Route
- AC 0 — Proposed 115 kV Alternating Current Cable Route (San Francisco)
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0 0.1 0.2 0.3 0.4 0.5 Miles
0 100 200 300 400 500 600 Meters
0 1,000 2,000 Feet
1 inch equals 2,000 feet 1:24,000
NAD 1983 UTM Zone 10N

DS-10

DC 20
DC 19
DC 18
DC 17
DC 16

China Camp
Peacock Gap Golf and Country Club
SAN MARGARITA
LOMAS
McNears Beach County Park
The Sisters
Point San Pedro
Quarry
Quarry
Mud
West Marin Island
East Marin Island
Point San Pablo
Wreck
Pt San Pablo Yacht Harbor
SAN PABLO STRAIT
SAN PABLO BAY
RAFAEL BAY
MARIN CO
CONTRA COSTA CO
RICHMOND CITY BOUNDARY
INDEFINITE BOUNDARY
RICHMOND CORPORATE BOUNDARY
Pinole Point
POINT PINOLE
Mud
Mud
Mud
Mud
Mud
San Pablo Creek

TRANS BAY CABLE PROJECT EIR	Figure 2. STUDY AREA	SHEET 4 OF 10
		2006

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Legend

Proposed/Alternative Cable Route Mileposts

- Mile/End Point
- Tenth of a Mile

Proposed/Alternative Routes

- DC 0 — Proposed 400 MW High Voltage Direct Current Cable Route
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- DS-# — USACE Dredge Disposal Areas

Note: Water depth will be confirmed as part of the TBC Marine Survey.

Source: U.S. Geological Survey 1:24,000-scale topographic maps.

0 0.1 0.2 0.3 0.4 0.5 Miles

0 100 200 300 400 500 600 Meters

0 1,000 2,000 Feet

1 inch equals 2,000.000001124,000

NAD 1983 UTM Zone 10N

DC 20

DC 21

DC 22

DC 23

DC 24

DC 25

DC 26

POTENTIAL SPLICE LOCATION

POTENTIAL SPLICE LOCATION

ANTICIPATED POST-CABLE LAY AREA WITH BARGE/HYDROPLOW

MARIN CO

CONTRA COSTA CO

RICHMOND

CITY

BOUNDARY

APPROXIMATE BOUNDARY

CITY BDY

Pinole

HERCULES

PINOLE

CITY

BOUNDARY

Lights

Pinole Point

Nitro

POINT PINOLE REGIONAL SHORELINE

SAN PABLO

Sobrante

BM 11

BM 19

Piling

MUD

Wilson Point

PACIFIC

ATCHISON

Gateley

Nob Hill

R 5 W

R 4 W

RICHMOND

24

P I N O L E S H O A L

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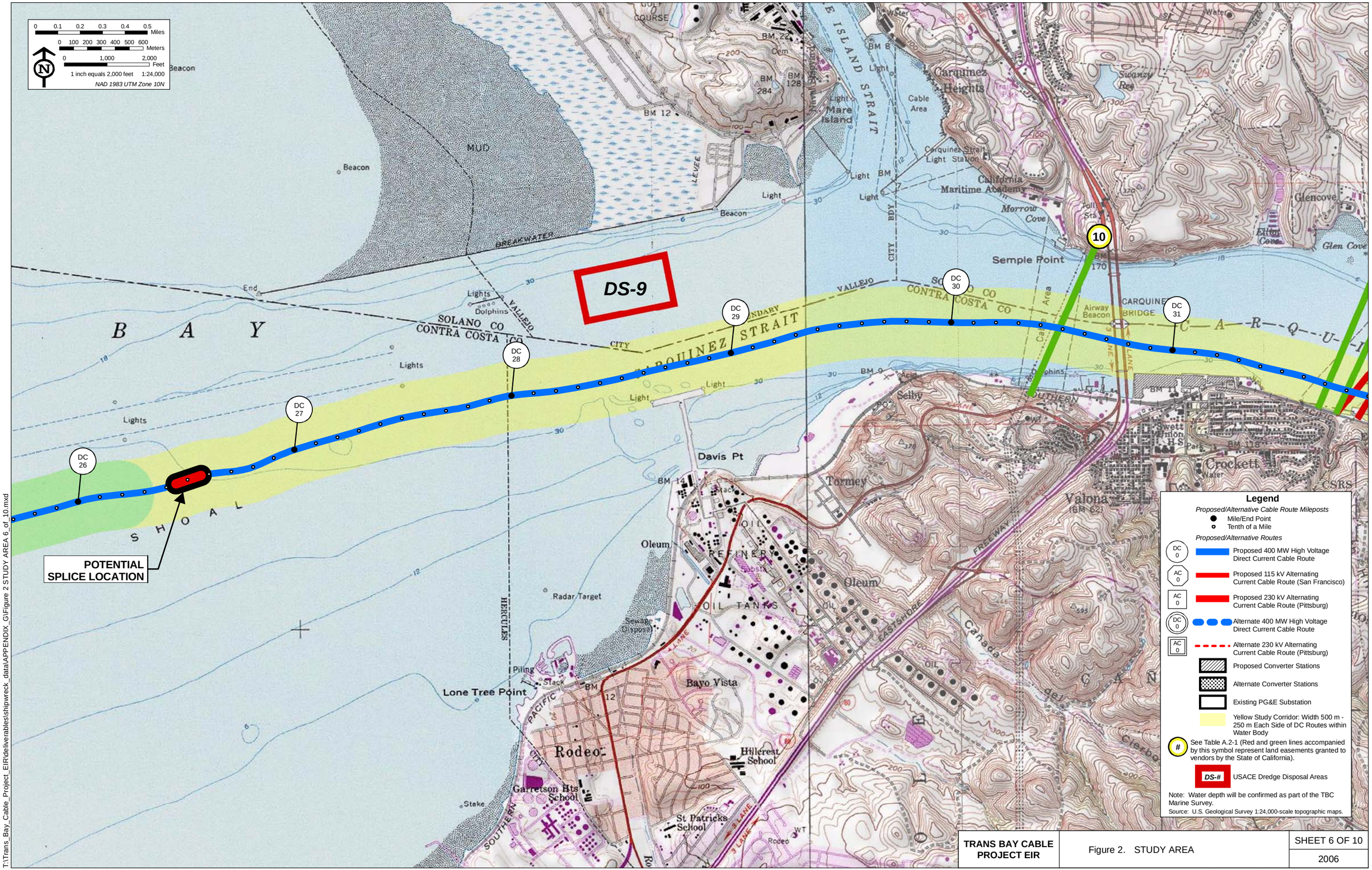
TRANS BAY CABLE PROJECT EIR	Figure 2. STUDY AREA	SHEET 5 OF 10
		2006



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TRANS BAY CABLE PROJECT EIR	Figure 2. STUDY AREA	SHEET 6 OF 10
		2006

POTENTIAL SPLICE LOCATION

DC 31
DC 32
DC 33
DC 34
DC 35
DC 36
DC 37
DC 38

9
8
7
6
5

Glencove
Glen Cove
Southampton Bay
Dillon Point
Commodore Jones Point
Farmar Sch
Eckley
Crockett
CSRS
CARQUINEZ STRAIT REGIONAL SHORELINE
Port Costa
Benicia Point
Benicia Capitol State Historical Mon
BENICIA
Pine Lake
Army Point
Sewage Disposal
Pt Carquinez
Benicia Shoals
Nevada Dock
Suisun Pt
Bulls Head Point
Mococo
Ozol
Nadeed
BOLSAS
ADAMBRE
CARQUINEZ STRAIT
SUISUN PT CHANNEL
SOLANO CO
CONTRA COSTA CO
BOUNDARY
SOUTHERN PACIFIC
LEVEE

Legend

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- Tenth of a Mile

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Note: Water depth will be confirmed as part of the TBC Marine Survey.

Source: U.S. Geological Survey 1:24,000-scale topographic maps.

0 0.1 0.2 0.3 0.4 0.5 Miles
0 100 200 300 400 500 600 Meters
0 1,000 2,000 Feet
1 inch equals 2,000 feet 1:24,000
NAD 1983 UTM Zone 10N

TRANS BAY CABLE PROJECT EIR	Figure 2. STUDY AREA	SHEET 7 OF 10
		2006

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Legend

Proposed/Alternative Cable Route Mileposts

- Mile/End Point
- Tenth of a Mile

Proposed/Alternative Routes

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Note: Water depth will be confirmed as part of the TBC Marine Survey.

Source: U.S. Geological Survey 1:24,000-scale topographic maps.

0 0.1 0.2 0.3 0.4 0.5 Miles

0 100 200 300 400 500 600 Meters

0 1,000 2,000 Feet

1 inch equals 2,000 feet 1:24,000

NAD 1983 UTM Zone 10N

DC 40 · DC 41 · DC 42 · DC 43 · DC 44

DC 38 · DC 39

POTENTIAL SPLICE LOCATION

5

SUISUN · Preston Pt · Tripod · Roe Island · NAVAL WEAPONS STATION · CONCORD · Tract 38 · Tract 39 · Gillespie Pt

PRESTON PT REACH · ROE ISLAND CHANNEL · SOLANO CONTRA COSTA

PT EDITH CROSSING RANGE · EAST BULLS HEAD CHANNEL · SOLANO CO CONTRA COSTA CO

Seal Islands · Pt Edith · Echo · Lands End · Dolphin · Hastings · Parking Area · Trailer Park · Suisun Slough · Peytonia Slough · Pacific Rd · Southern Pacific · Benicia-Martinez Bridge · Levee · Piles · Beacon · Light · Mud · BM 20 · BM 15 · BM 11 · BM 9 · BM 8 · BM 7 · BM 4

TRANS BAY CABLE PROJECT EIR	Figure 2. STUDY AREA	SHEET 8 OF 10
		2006

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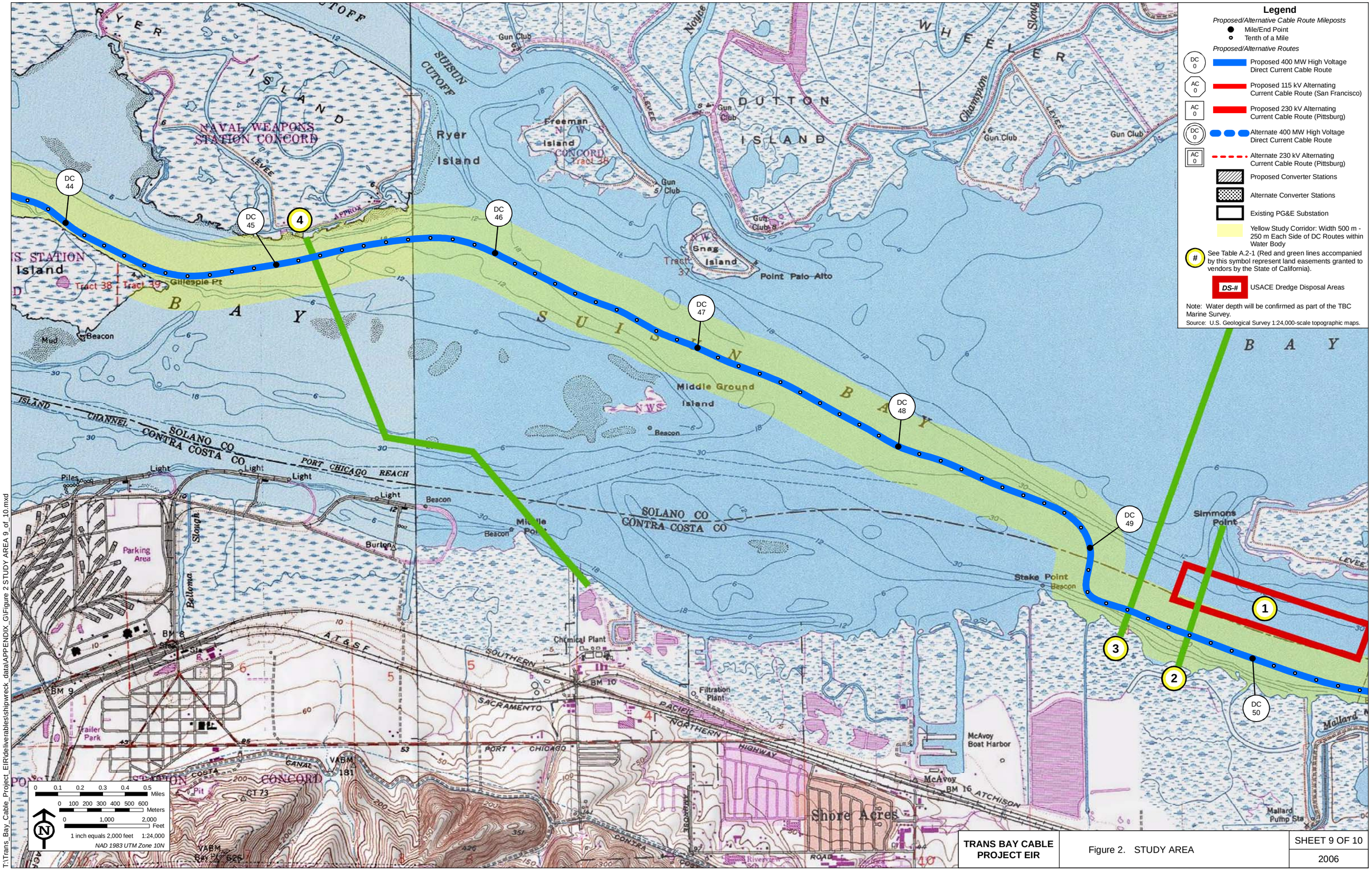

Legend

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Source: U.S. Geological Survey 1:24,000-scale topographic maps.

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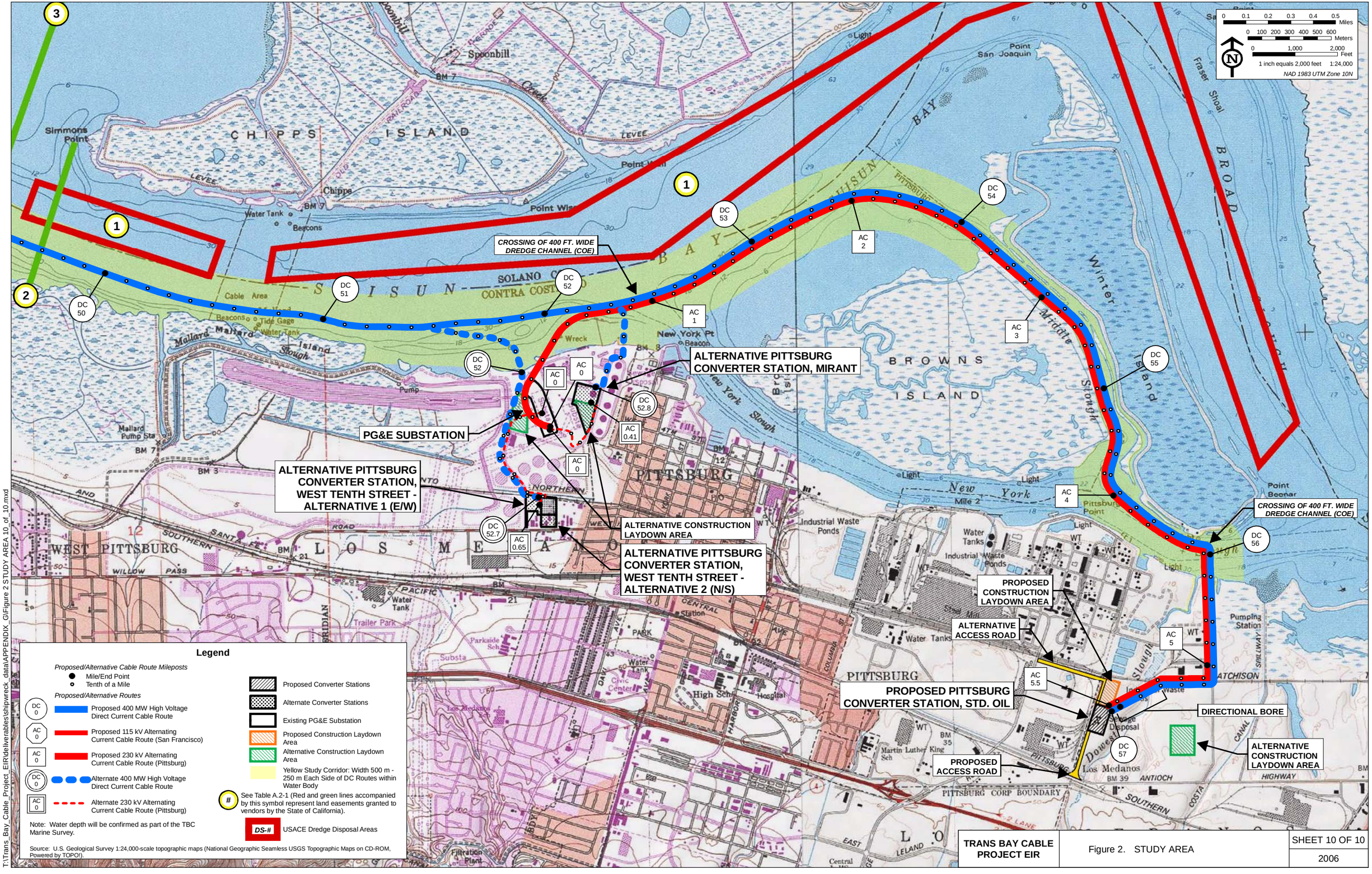
TRANS BAY CABLE PROJECT EIR	Figure 2. STUDY AREA	SHEET 9 OF 10
		2006



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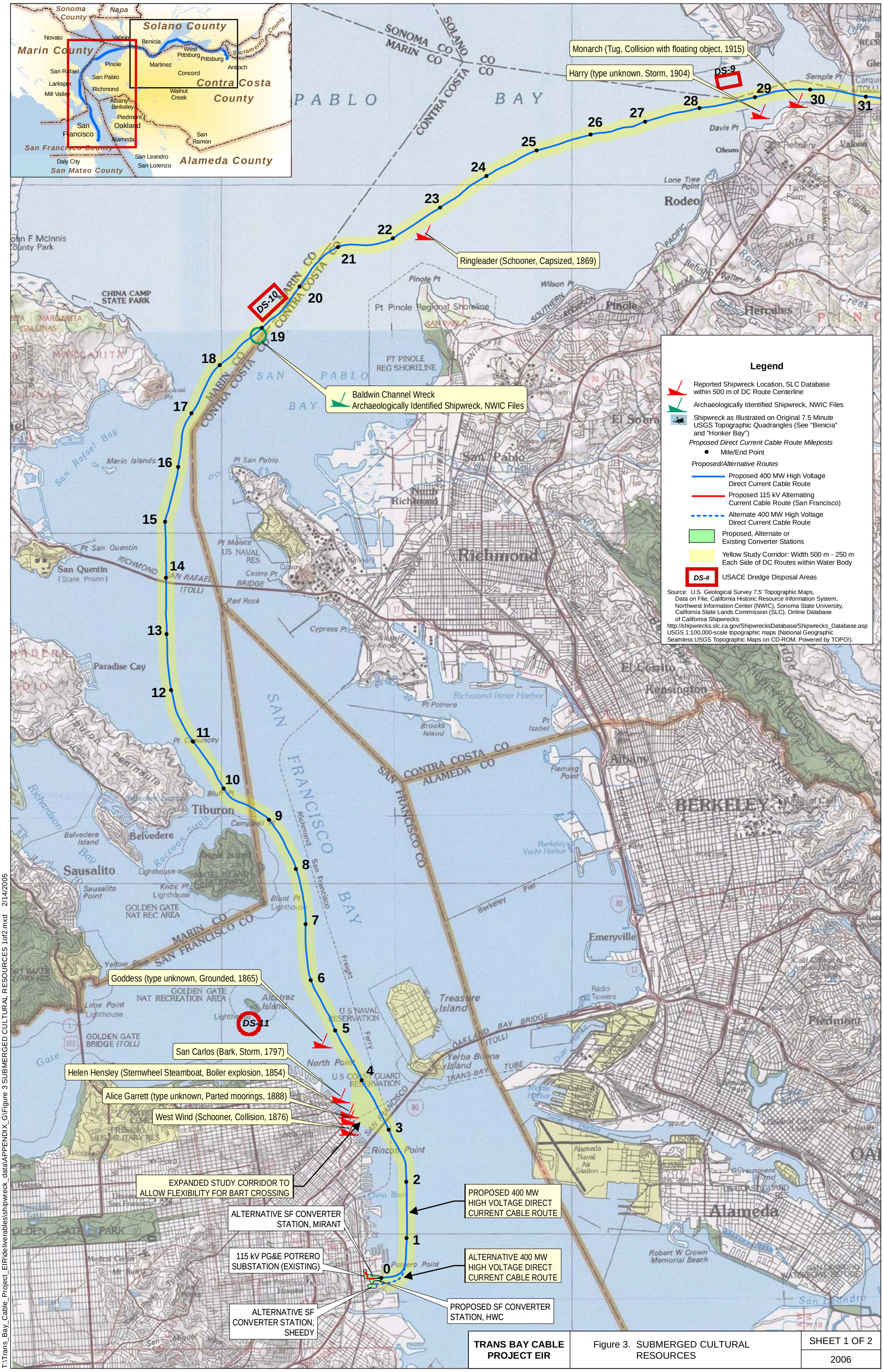
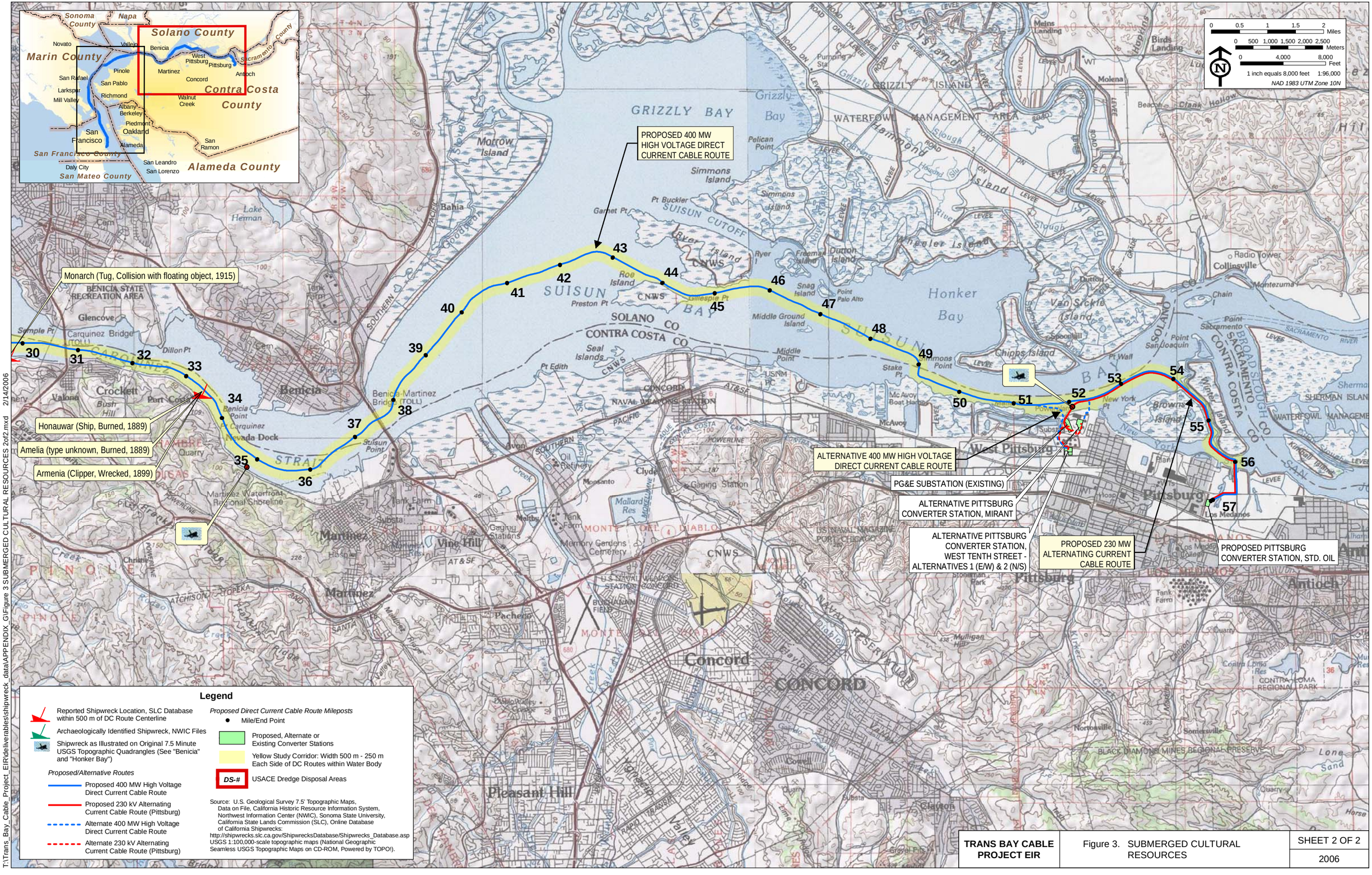
TRANS BAY CABLE PROJECT EIR	Figure 2. STUDY AREA	SHEET 10 OF 10
		2006



T:\Trans_Bay_Cable_Project_EIR\deliverables\shipwreck_data\APPENDIX_G\Figure 3 SUBMERGED CULTURAL RESOURCES 1of2.mxd 2/14/2005

TRANS BAY CABLE PROJECT EIR	Figure 3. SUBMERGED CULTURAL RESOURCES	SHEET 1 OF 2 2006



TRANS BAY CABLE PROJECT EIR	Figure 3. SUBMERGED CULTURAL RESOURCES	SHEET 2 OF 2 2006

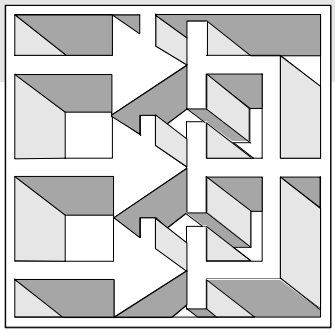
This appendix to the Trans Bay Cable Project EIR presents the following three audible noise studies that were prepared by Siemens for the proposed converter station sites in San Francisco and Pittsburg:

- Preliminary Audible Noise Study – Potrero
- Preliminary Audible Noise Study – Pittsburg
- Preliminary Audible Noise Study with Noise Abatement – Pittsburg

Note that two noise studies were done for the Pittsburg converter stations; the first without noise abatement and the second with noise abatement. The proposed Project includes the noise abatement measures recommended in the second Pittsburg study.

For color representations of the figures in this appendix, refer to the file on the enclosed CD or refer to the City of Pittsburg website for the Project.

Trans Bay Cable Project (400 MW)



Preliminary Audible Noise Study

Potrero

Rev.	Date	Section	Page	Remarks	Signature
0	02.12.05	all	all	first issue	
1	10.04.06	1.4.4, Fig. 4.1, Fig. 4.2, Fig. 4.3, Fig. 4.4	4, 11, 12	Change of property for Mirant Alt.	
2	24.04.06	1.4.4, 1.4.5 Fig. 5.1, Fig. 5.2, Fig. 5.3, Fig. 5.4	4, 13, 14	Second Mirant alternative	

1 Audible Noise Study

1.1 Basis

The following report outlines the basis of the audible noise study and how the preliminary audible noise levels at the different alternative Converter Stations have been calculated.

1.1.1 Basis of Acoustical Sound Prediction Calculation

The simplified basic formula of acoustical calculation is:

$$L_{AT}(LT) = L_{WA} + D_c - A_{div} - A_{atm} - A_{gr} - A_{bar} - A - C_{met}$$

The symbols mean (according to DIN EN ISO 9613-2):

$L_{AT}(LT)$: long-term average A-weighted sound pressure level
L_{WA} : A-weighted sound power level of the sound source
D_c : correction for directivity of the source
A_{div} : attenuation due to the geometrical divergence
A_{atm} : attenuation due to air absorption
A_{gr} : attenuation due to ground effects
A_{bar} : the attenuation due to screening (including buildings, land contours, barriers, noise screens, retaining walls and cuttings)
A_{misc} : the attenuation due to other miscellaneous effects (e.g. dense foliage, industrial sites)
C_{met}: meteorological correction

The sound propagation has been calculated with the computer program “Cadna A”, using the international regulation for noise prediction calculation “ISO 9613-2”. The model describes the sound pressure level at a certain distance from the sound source.
The buildings and the fire protection walls of the stations are digitized for the calculation. The building models in the station area are observed as reflectors.
The calculation of the sound power level of the facades of the buildings is in line with VDI 2571.
The sound propagation was determined in octave bands with nominal midband frequencies from 31,5 Hz to 4.000 Hz.
Sound power levels in octave bandwidth levels, distance, heights of imission points and sound sources, walls and reflectors, air absorption, attenuation and reflection caused by walls have been entered into the calculations.
Vegetation has an attenuation effect on sound propagation. However, in this study it was not included because it is assumed that no vegetation is existing at the converter stations.
A flat landscape was assumed in the calculation area of the HVDC Stations. The surrounding buildings have not been regarded in the calculation.

1.2 Analysis Methodology

All calculations performed in the program are based on standard noise propagation equations. The program calculates the sound pressure level impact from each source for specified points of receivers. These sound levels are combined to obtain the overall substation sound pressure levels and the overall (A-weighted) sound pressure level for each critical imission. The sound level calculation at each individual location also accounts for the height of the receiver and noise blockage due to any interceding barriers, such as terrain or walls.
The location of the sound sources correspond to the arrangement of the equipment according to the preliminary station layout of the Converter Stations.

1.3 Audible Noise Level Limits

The allowable audible noise levels are according table 1:

		Potrero
Measuring unit		dB(A), Leq (1 hour)
Limit at property line of **HWC** site	dB(A)	75
Limit at property line of **Sheedy** site	dB(A)	75
Limit at property line of **Mirant** site	dB(A)	75
Receivers at **HWC** site	dB(A)	n.a.
Receivers at **Sheedy** site	dB(A)	n.a.
Receivers at **Mirant** site	dB(A)	n.a.
Ambient noise		not to be considered for limit
Height of measuring / calculation	m	1,5

Tab. 1: Audible noise limits

1.4 Analysis Results

Based on the preliminary layouts (L-configuration and rectangular configuration) and preliminary audible noise levels for the respective components the analysis was done for the four different alternative converter station sites/alternatives.

1.4.1 HWC site

The layout and location of sound sources is shown in Fig. 1.1 and Fig. 1.2. The calculated sound pressure at the property lines is indicated in Fig. 1.3. The maximum sound pressure value at the property line is calculated as 73 dB(A) which is within the limits specified.

1.4.2 Sheedy site

The layout and location of sound sources is shown in Fig. 2.1 and Fig. 2.2. The calculated sound pressure at the property lines is indicated in Fig. 2.3. The maximum sound pressure value at the property line is calculated as 72 dB(A) which is within the limits specified.

1.4.3 Mirant site

The layout and location of sound sources is shown in Fig. 3.1 and Fig. 3.2. The calculated sound pressure at the property lines is indicated in Fig. 3.3. The maximum sound pressure value at the property line is calculated as 73 dB(A) which is within the limits specified.

1.4.4 Mirant alternative site 1

The layout and location of sound sources is shown in Fig. 4.1 to Fig. 4.3. The calculated sound pressure at the property lines is indicated in Fig. 4.4. The maximum sound pressure value at the property line is calculated as 70 dB(A) which is within the limits specified.

1.4.5 Mirant alternative site 2

The layout and location of sound sources is shown in Fig. 5.1 to Fig. 5.3. The calculated sound pressure at the property lines is indicated in Fig. 5.4. The maximum sound pressure value at the property line is calculated as 71 dB(A) which is within the limits specified.

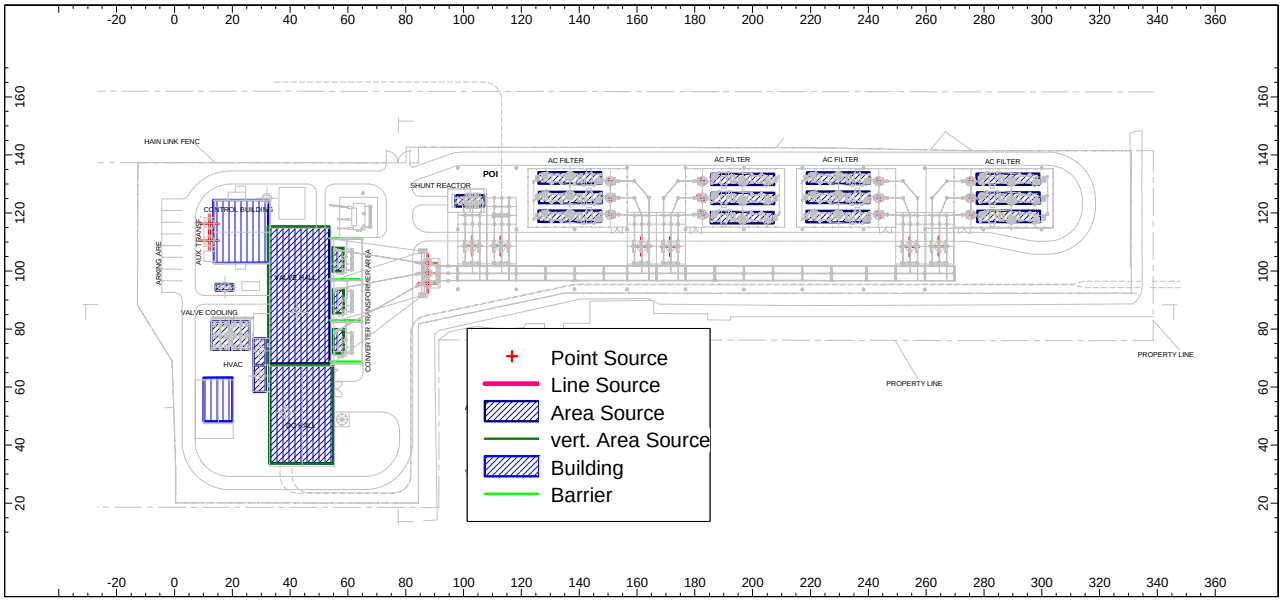


Fig. 1.1: Potrero, HWC, layout with sound sources

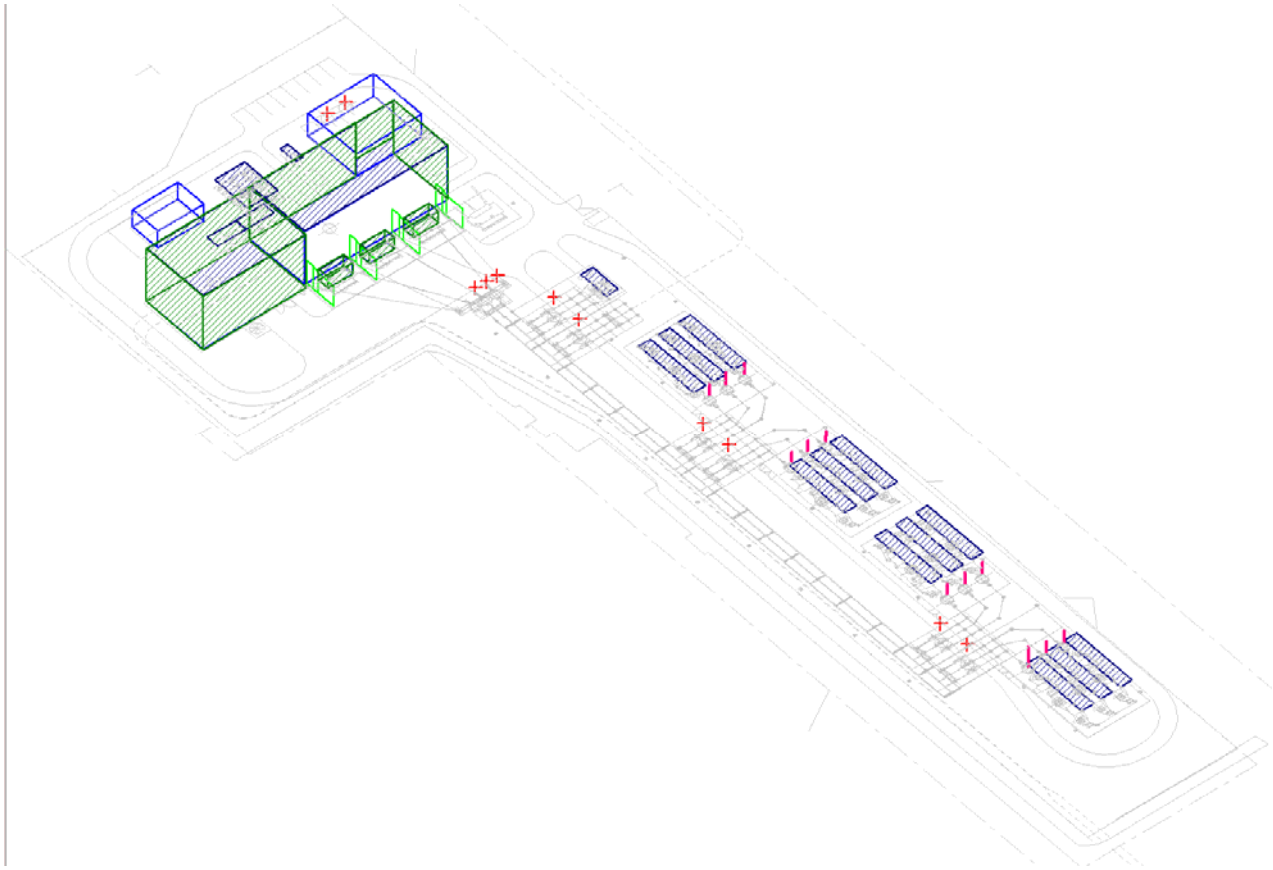


Fig. 1.2: Potrero, HWC, 3D view

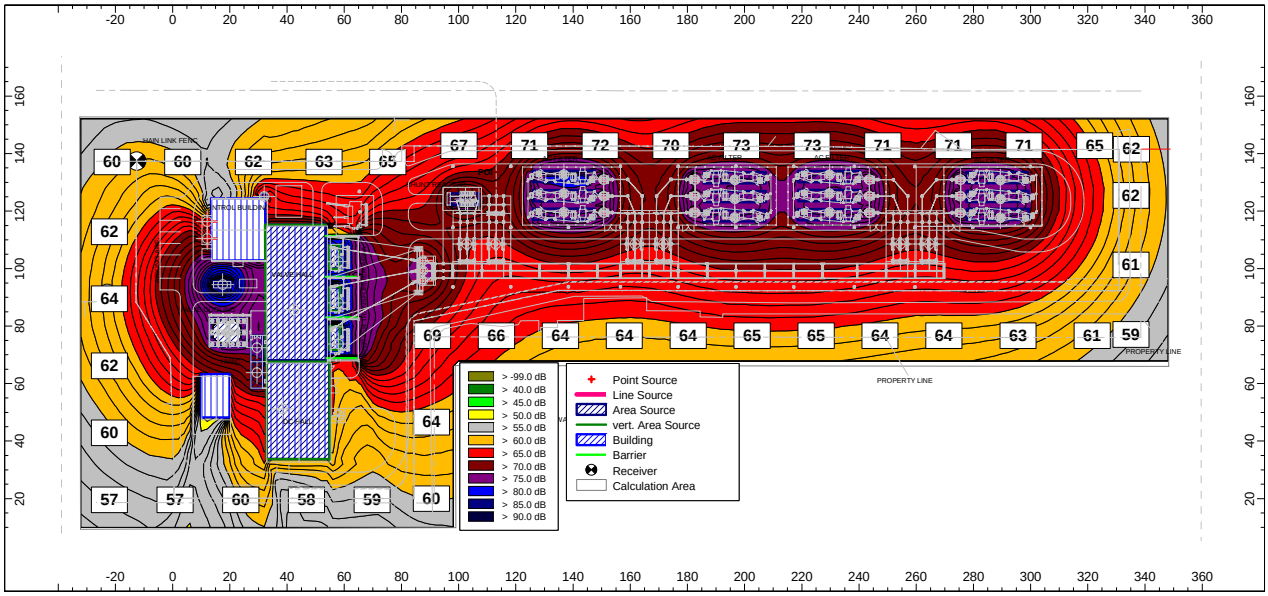


Fig. 1.3: Potrero, HWC, noise contour map at height of 1,5 m

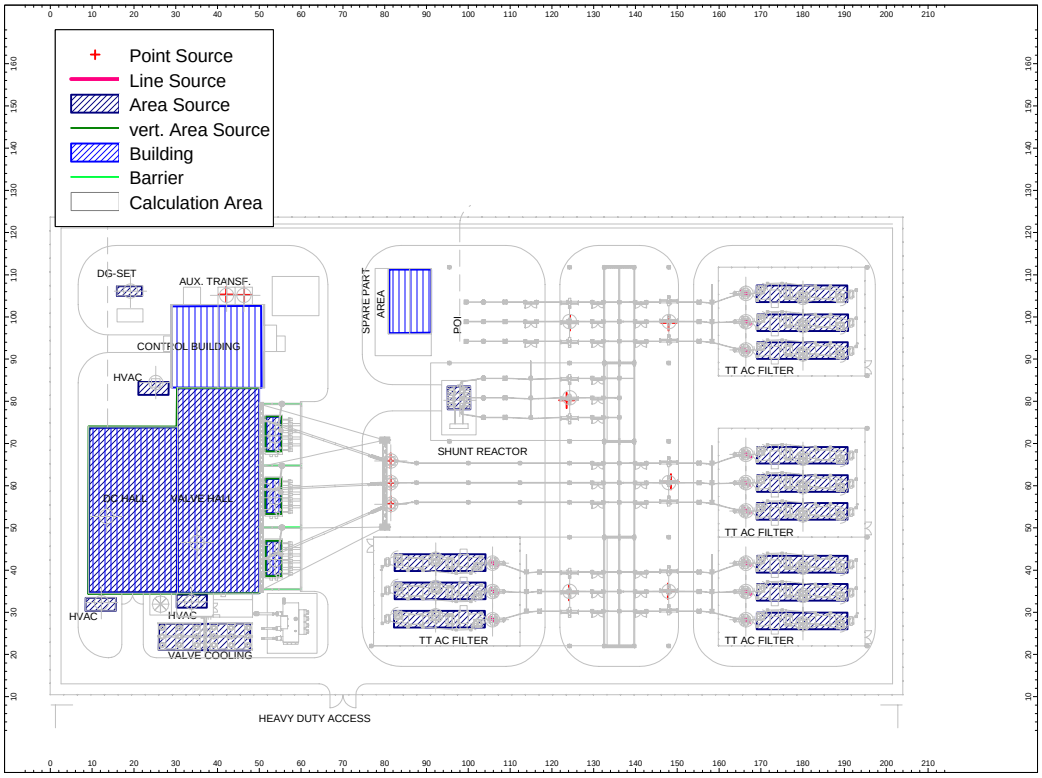


Fig. 2.1: Potrero, Sheedy, layout with sound sources

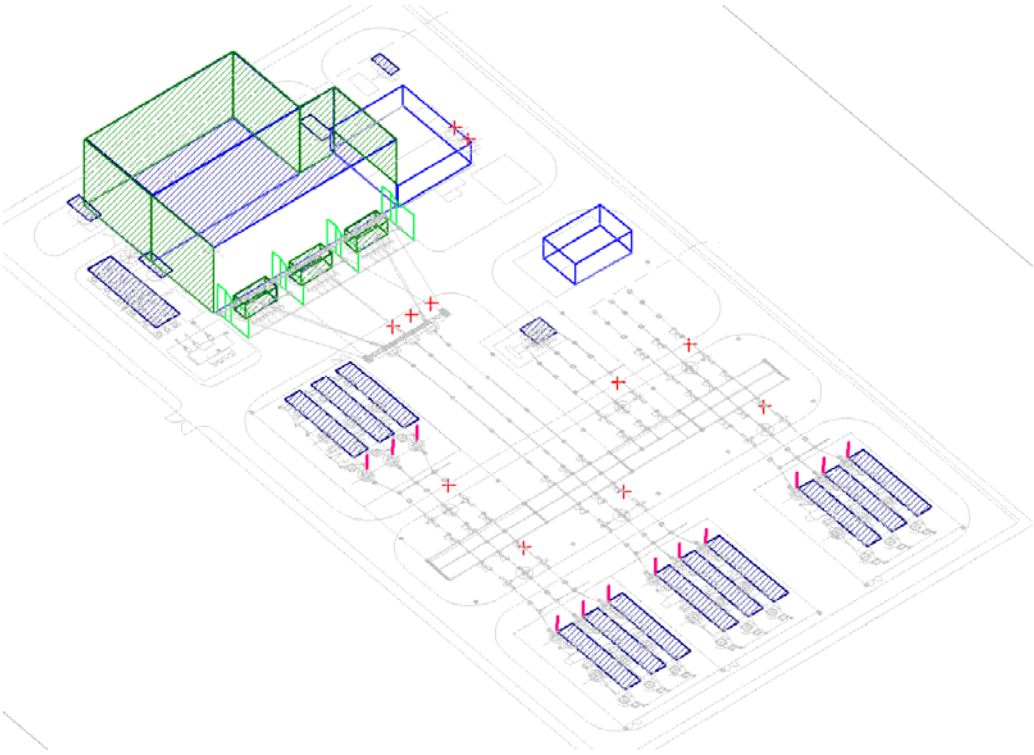


Fig. 2.2: Potrero, Sheedy, 3D view

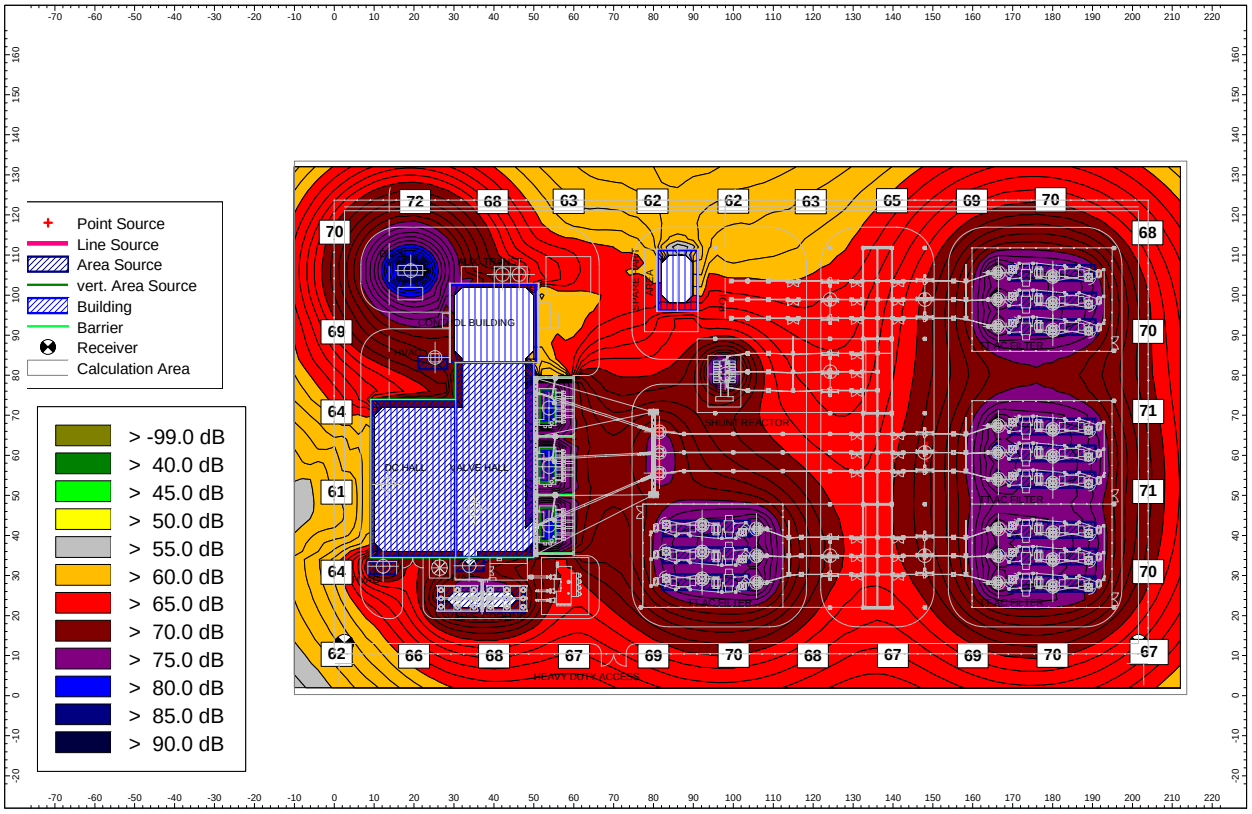


Fig. 2.3: Potrero, Sheedy, noise contour map at height of 1,5 m

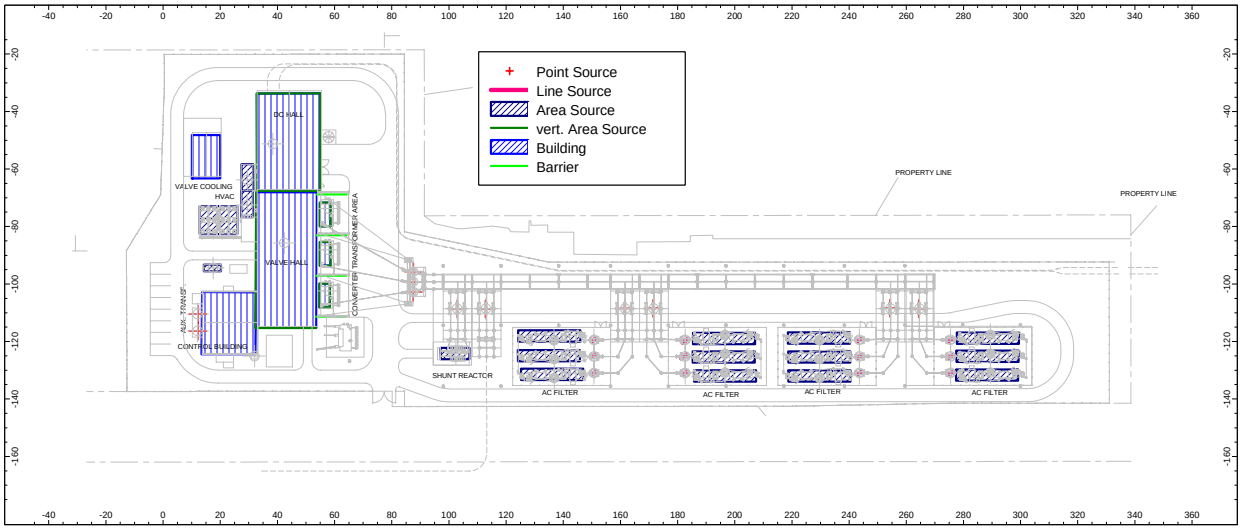


Fig. 3.1: Potrero, Mirant, layout with sound sources

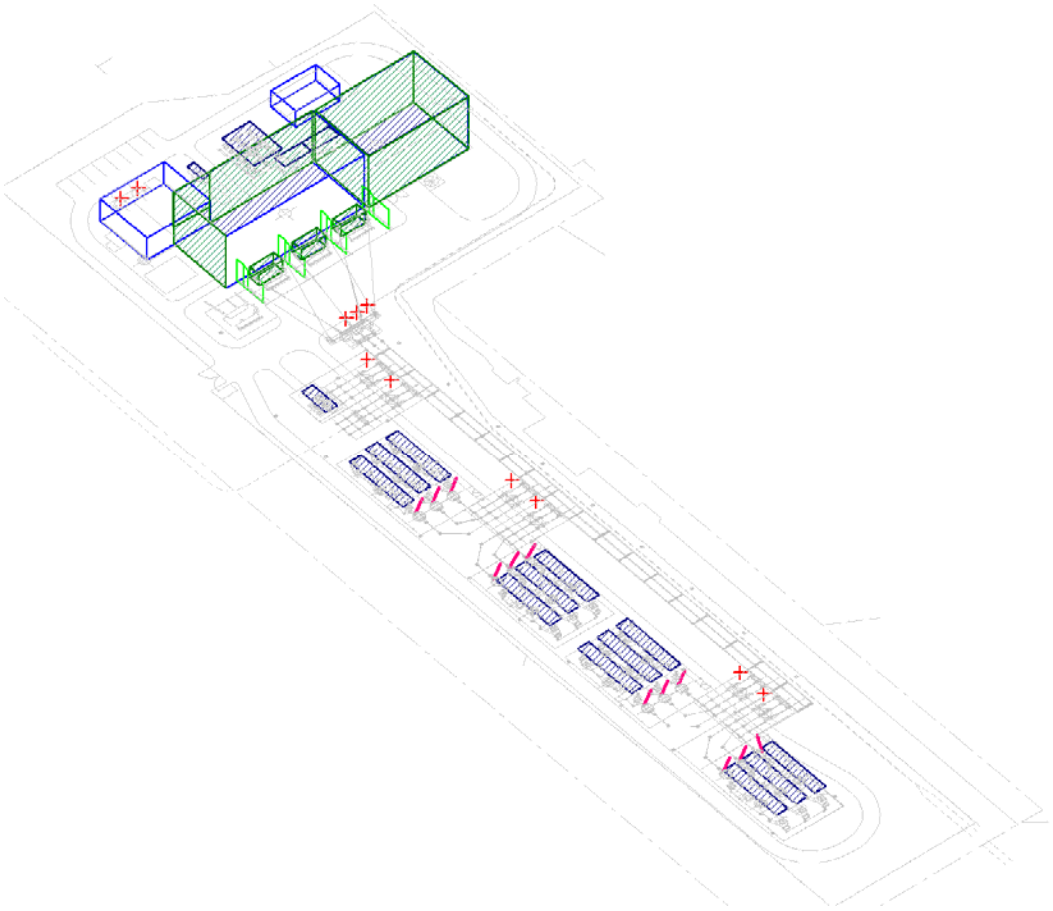


Fig. 3.2: Potrero, Mirant, 3D view

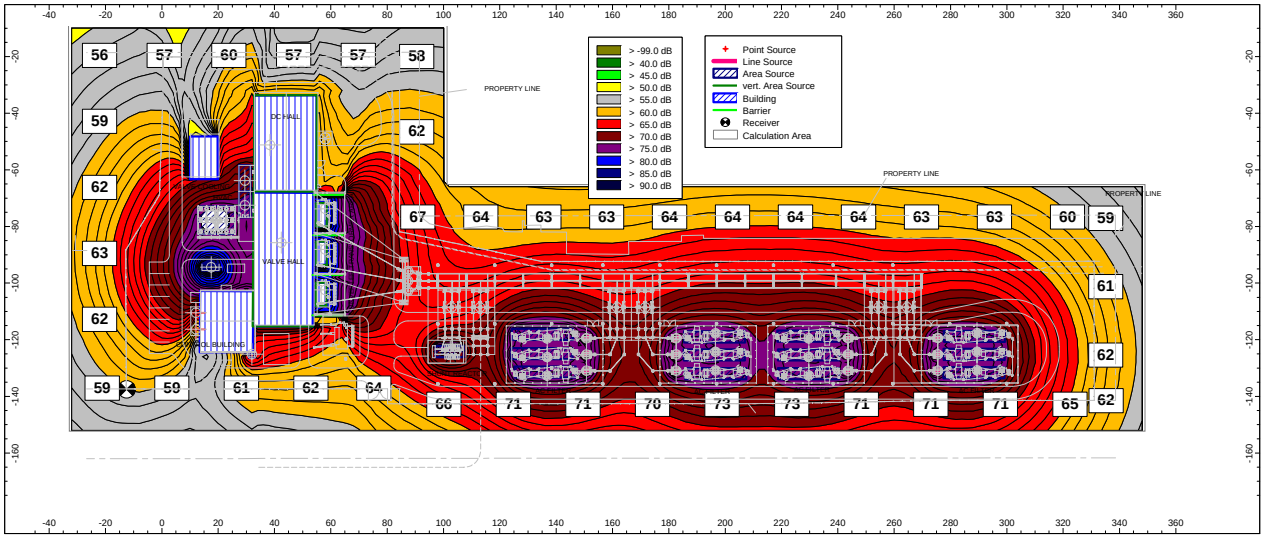


Fig. 3.3: Potrero, Mirant, noise contour map at height of 1,5 m

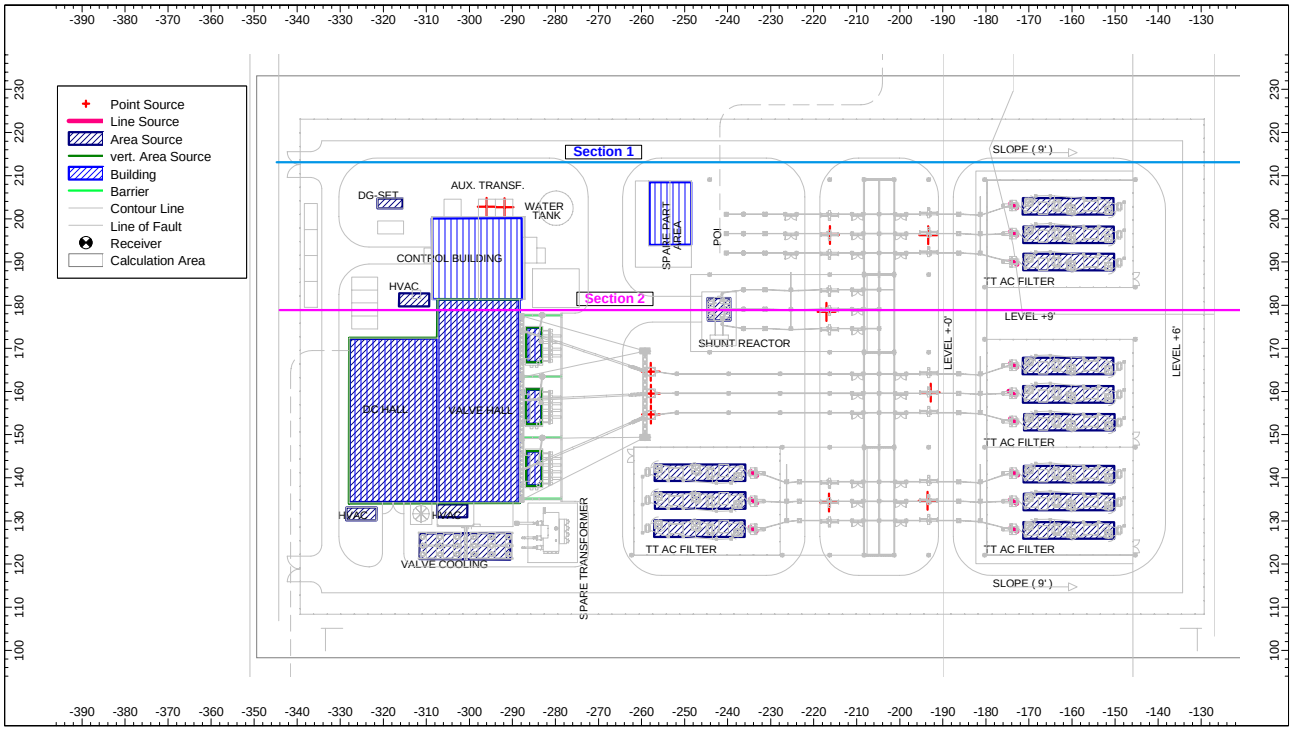
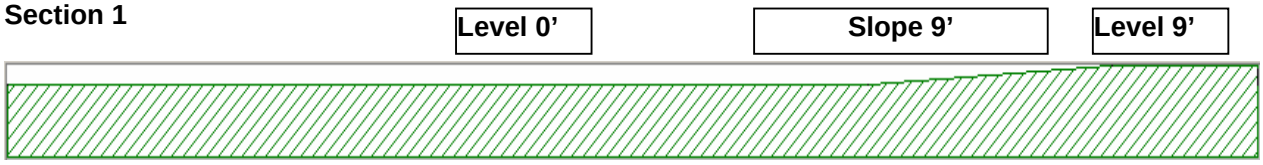


Fig. 4.1: Potrero, Mirant Alternative 1, layout with sound sources

Section 1



Section 2

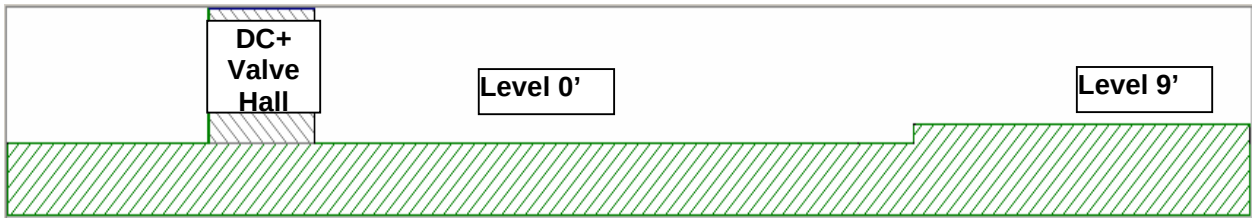


Fig. 4.2: Potrero, Mirant Alternative 1, sections

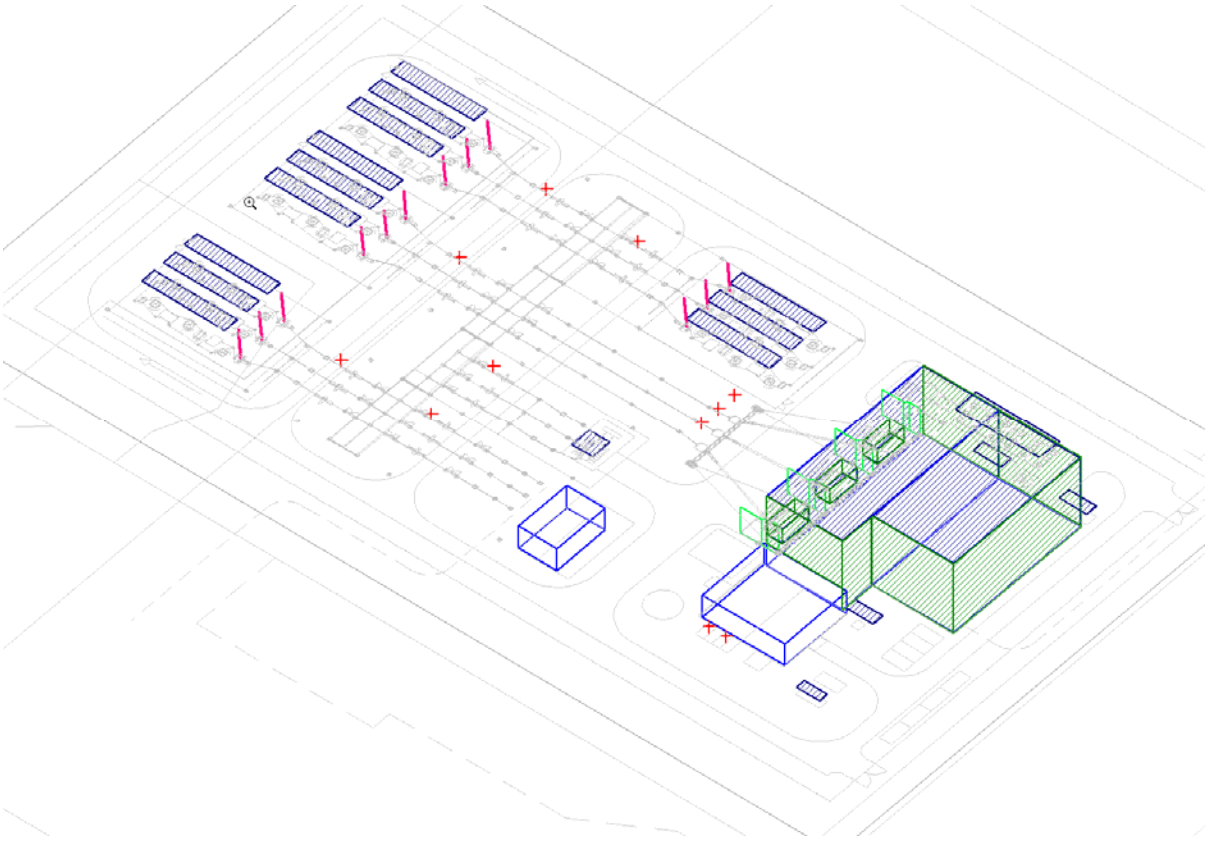


Fig. 4.3: Potrero, Mirant Alternative 1, 3D view

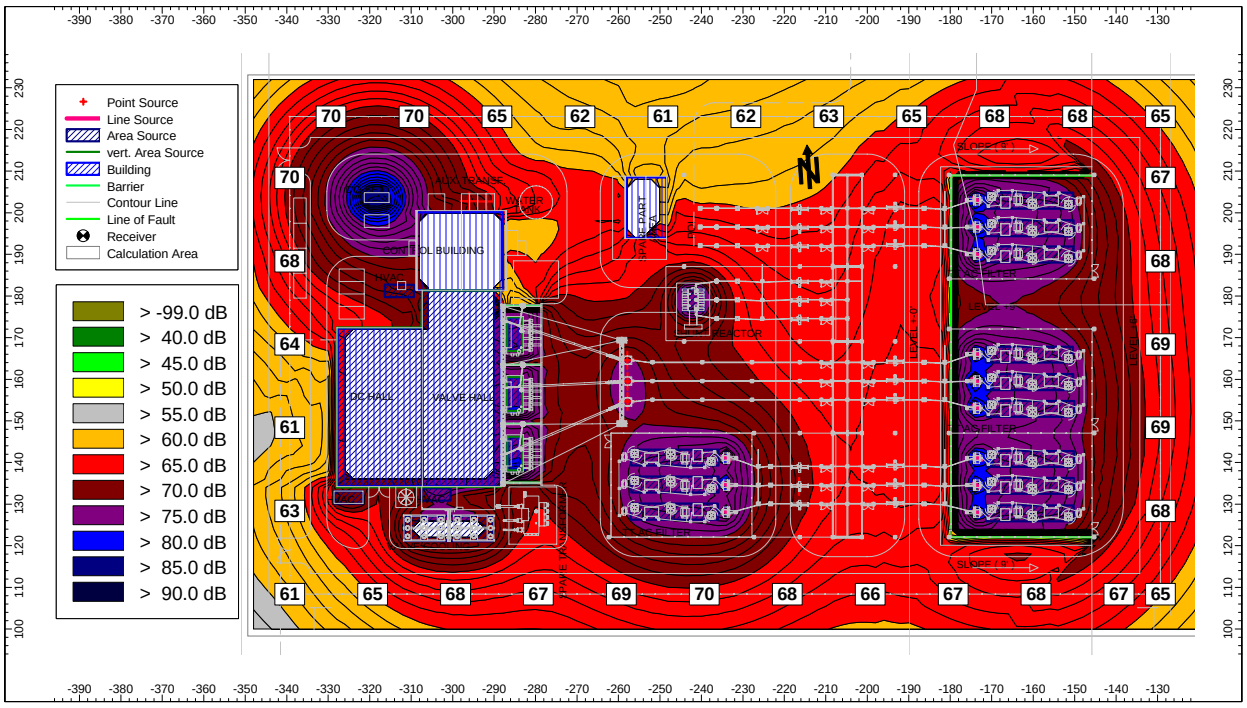


Fig. 4.4: Potrero, Mirant Alternative 1, noise contour map at height of 1,5 m

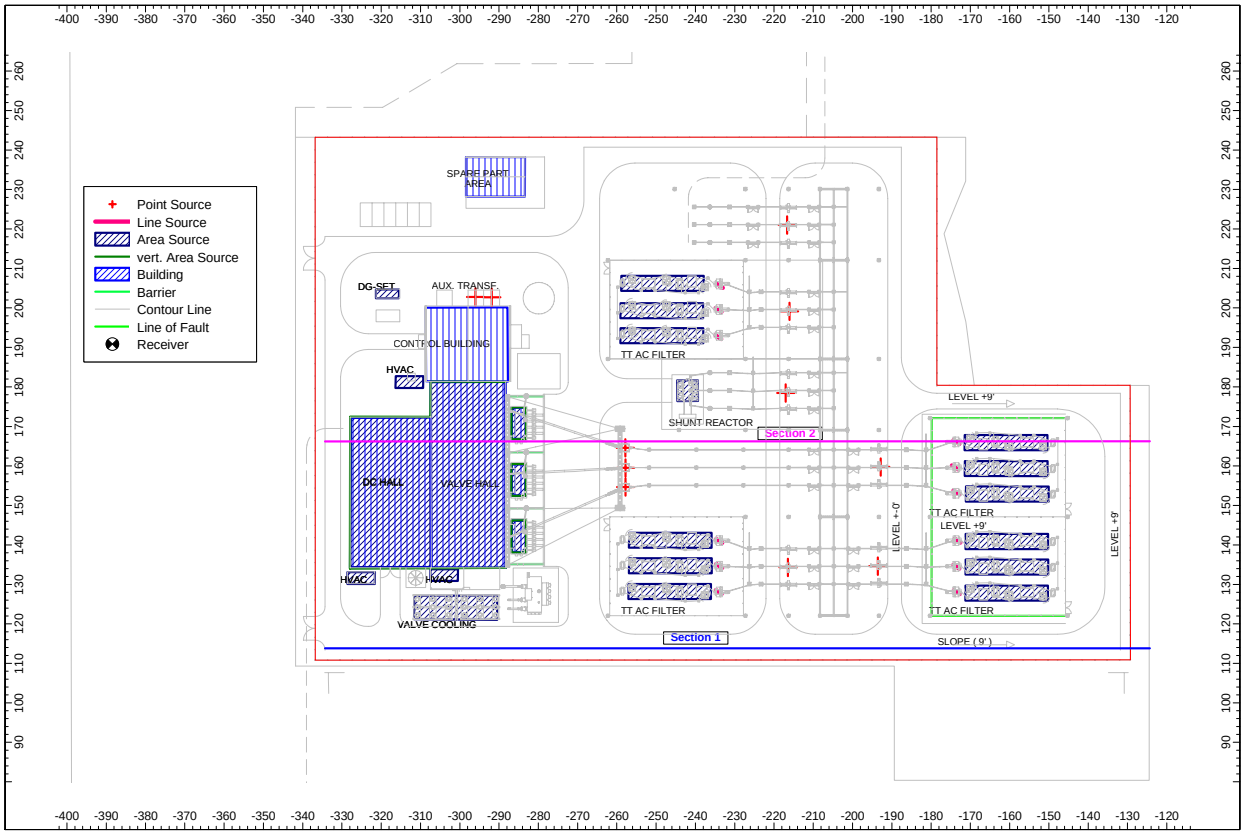
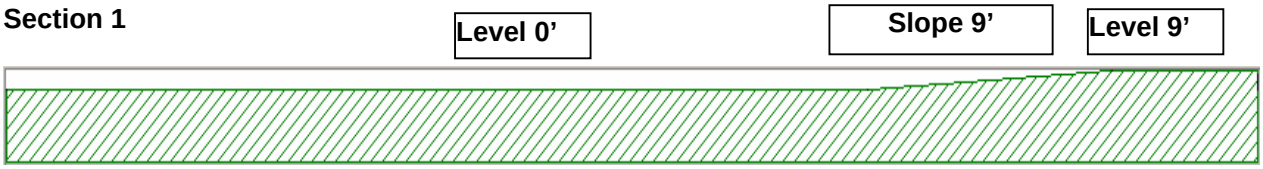


Fig. 5.1: Potrero, Mirant Alternative 2, layout with sound sources

Section 1



Section 2

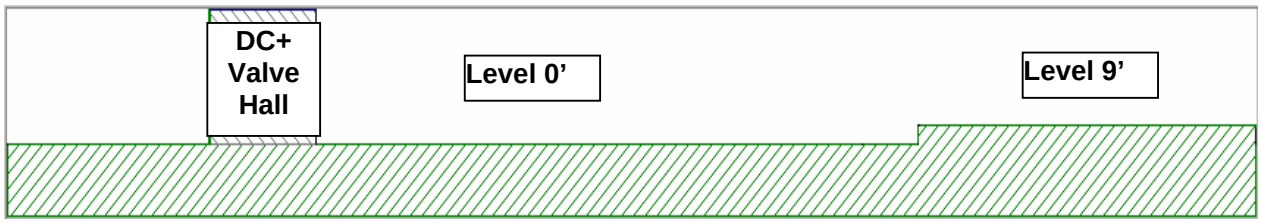


Fig. 5.2: Potrero, Mirant Alternative 2, sections

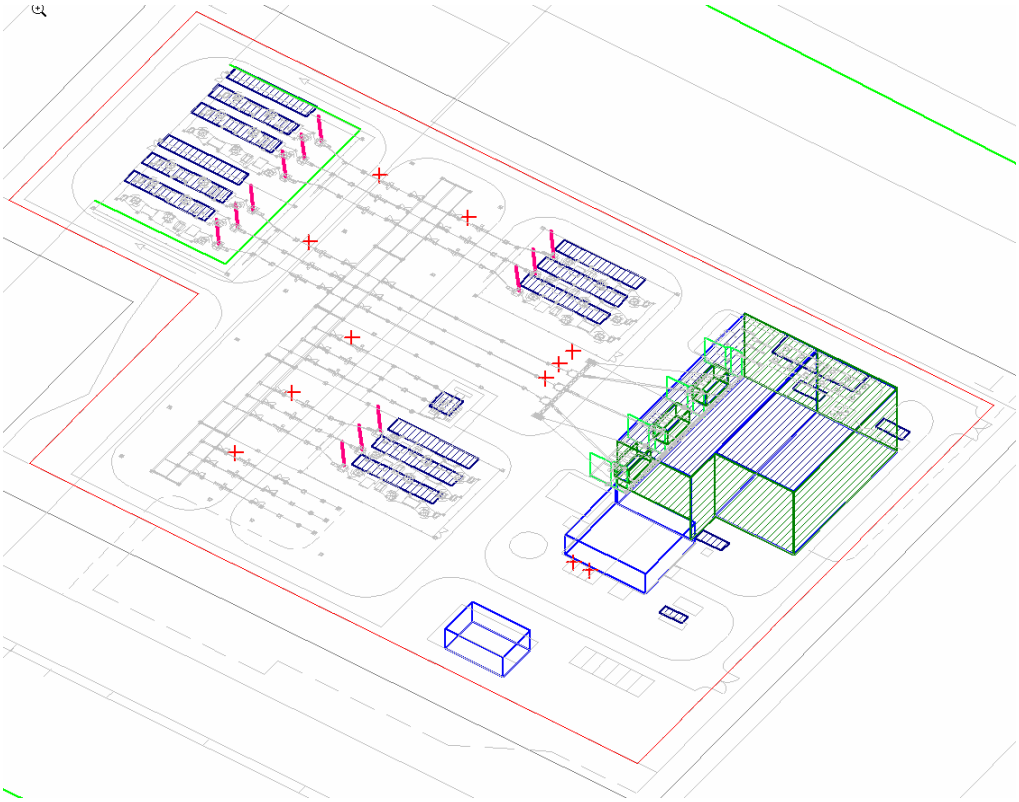


Fig. 5.3: Potrero, Mirant Alternative 2, 3D view

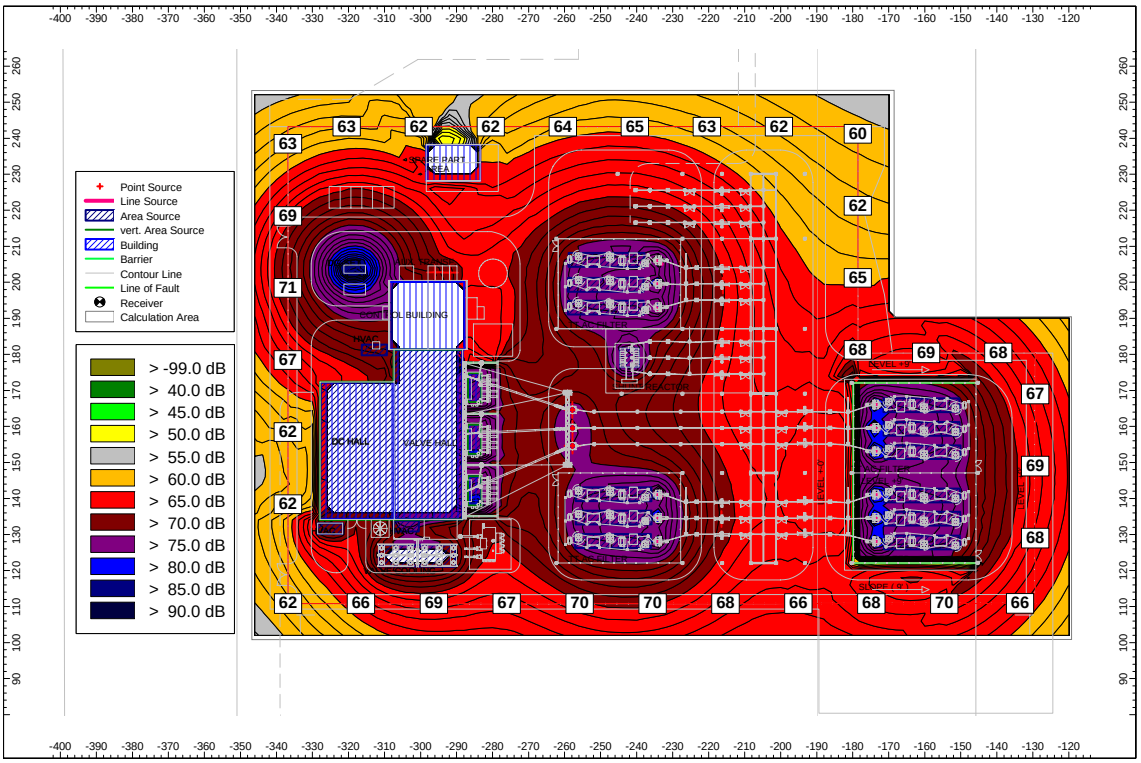
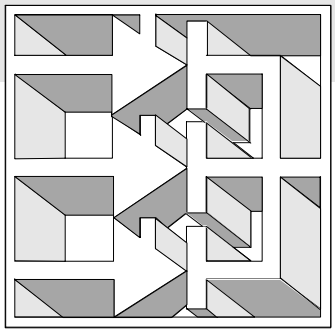


Fig. 5.4: Potrero, Mirant Alternative 2, noise contour map at height of 1,5 m

Trans Bay Cable Project (400 MW)



Preliminary Audible Noise Study

Pittsburg

Rev.	Date	Section	Page	Remarks	Signature
0	02.12.05	all	all	first issue	

1 Audible Noise Study

1.1 Basis

The following report outlines the basis of the audible noise study and how the preliminary audible noise levels at the different alternative Converter Stations have been calculated.

1.1.1 Basis of Acoustical Sound Prediction Calculation

The simplified basic formula of acoustical calculation is:

$$L_{AT}(LT) = L_{WA} + D_c - A_{div} - A_{atm} - A_{gr} - A_{bar} - A - C_{met}$$

The symbols mean (according to DIN EN ISO 9613-2):

$L_{AT}(LT)$: long-term average A-weighted sound pressure level
L_{WA} : A-weighted sound power level of the sound source
D_c : correction for directivity of the source
A_{div} : attenuation due to the geometrical divergence
A_{atm} : attenuation due to air absorption
A_{gr} : attenuation due to ground effects
A_{bar} : the attenuation due to screening (including buildings, land contours, barriers, noise screens, retaining walls and cuttings)
A_{misc} : the attenuation due to other miscellaneous effects (e.g. dense foliage, industrial sites)
C_{met}: meteorological correction

The sound propagation has been calculated with the computer program “Cadna A”, using the international regulation for noise prediction calculation “ISO 9613-2”. The model describes the sound pressure level at a certain distance from the sound source.
The buildings and the fire protection walls of the stations are digitized for the calculation. The building models in the station area are observed as reflectors.
The calculation of the sound power level of the facades of the buildings is in line with VDI 2571.
The sound propagation was determined in octave bands with nominal midband frequencies from 31,5 Hz to 4.000 Hz.
Sound power levels in octave bandwidth levels, distance, heights of imission points and sound sources, walls and reflectors, air absorption, attenuation and reflection caused by walls have been entered into the calculations.
Vegetation has an attenuation effect on sound propagation. However, in this study it was not included because it is assumed that no vegetation is existing at the converter stations.
A flat landscape was assumed in the calculation area of the HVDC Stations and the dwellings nearby. The surounding buildings at 10th Street and the oil stores as well as the embankment to the east of the oil stores at Mirant Power Station have been regarded in the calculation.
The residential area to the east of Mirant Power Station is regarded as on the same level as the converter station.

1.2 Analysis Methodology

All calculations performed in the program are based on standard noise propagation equations. The program calculates the sound pressure level impact from each source for specified points of receivers. These sound levels are combined to obtain the overall substation sound pressure levels and the overall (A-weighted) sound pressure level for each critical imission. The sound level calculation at each individual location also accounts for the height of the receiver and noise blockage due to any interceding barriers, such as terrain or walls.

The location of the sound sources correspond to the arrangement of the equipment according to the preliminary station layout of the Converter Stations.

1.3 Audible Noise Level Limits

The allowable audible noise levels are according table 1:

		Pittsburg
Measuring unit		dB(A), Ldn 24h average, 10 dB penalty between 22:00h - 07:00h
Limit at property line **10th Street** site	dB(A)	• north 75 • east, 75 • west 75 • south, n.a.
Limit at property line **Mirant** site	dB(A)	• north 75 • east, n.a • west 75 • south, n.a.
Limit at property line **Standard Oil** site	dB(A)	• all directions 75
Receivers at **10th Street** site	dB(A)	• south 60, residences, IO1, IO2, IO3 • east 60, residences, IO4, IO5, IO6
Receivers at **Mirant** site	dB(A)	• south 70, park, IO5, IO6, IO7 • east 60, residences, IO1, IO2, IO3, IO4
Receivers at **Standard Oil** site	dB(A)	• south 60, residences, IO1 – IO5
Ambient noise		not to be considered for limit
Height of measuring / calculation	m	1,5

Tab. 1: Audible noise limits

1.4 Analysis Results

Based on the preliminary layout (rectangular configuration) and preliminary audible noise levels for the respective components the analysis was done for the four different alternative converter station sites/alternatives.

1.4.1 10th Street site, N - S orientation

The layout and location of sound sources and receivers is shown in Fig. 1.1, 1.2 and 1.3. The calculated sound pressure at the property lines and the receivers is indicated in Fig. 1.4. The maximum sound pressure values are calculated as:

	Max. calculated audible noise level [dB(A)]
north property line	78
east property line	76
west property line	79
south property line	n.a.
Receivers	70 (R1)

which exceeds the limits specified for the property lines and the receivers.

1.4.2 10th Street site, E - W orientation

The layout and location of sound sources and receivers is shown in Fig. 2.1, 2.2 and 2.3. The calculated sound pressure at the property lines and the receivers is indicated in Fig. 2.4. The maximum sound pressure values are calculated as:

	Max. calculated audible noise level [dB(A)]
north property line	79
east property line	78
west property line	79
south property line	n.a.
Receivers	59 (R2 and R3)

which exceeds the limits specified for the property lines.

1.4.3 Mirant site

The layout and location of sound sources and receivers is shown in Fig. 3.1, 3.2 and 3.3. The calculated sound pressure at the property lines and the receivers is indicated in Fig. 3.4. The maximum sound pressure values are calculated as:

	Max. calculated audible noise level [dB(A)]
north property line	77
east property line	n.a.
west property line	78
south property line	n.a.
Receivers	54 (R7)

which exceeds the limits specified for the property lines.

1.4.4 Standard Oil site

The layout and location of sound sources and receivers is shown in Fig. 4.1, 4.2 and 4.3. The calculated sound pressure at the receivers is indicated in Fig. 4.4 and the calculated sound pressure at the property lines is indicated in Fig. 4.5. The maximum sound pressure values are calculated as:

	Max. calculated audible noise level [dB(A)]
north property line	79
east property line	79
west property line	77
south property line	78
Receivers	46 (R3)

which exceeds the limits specified for the properpty lines.

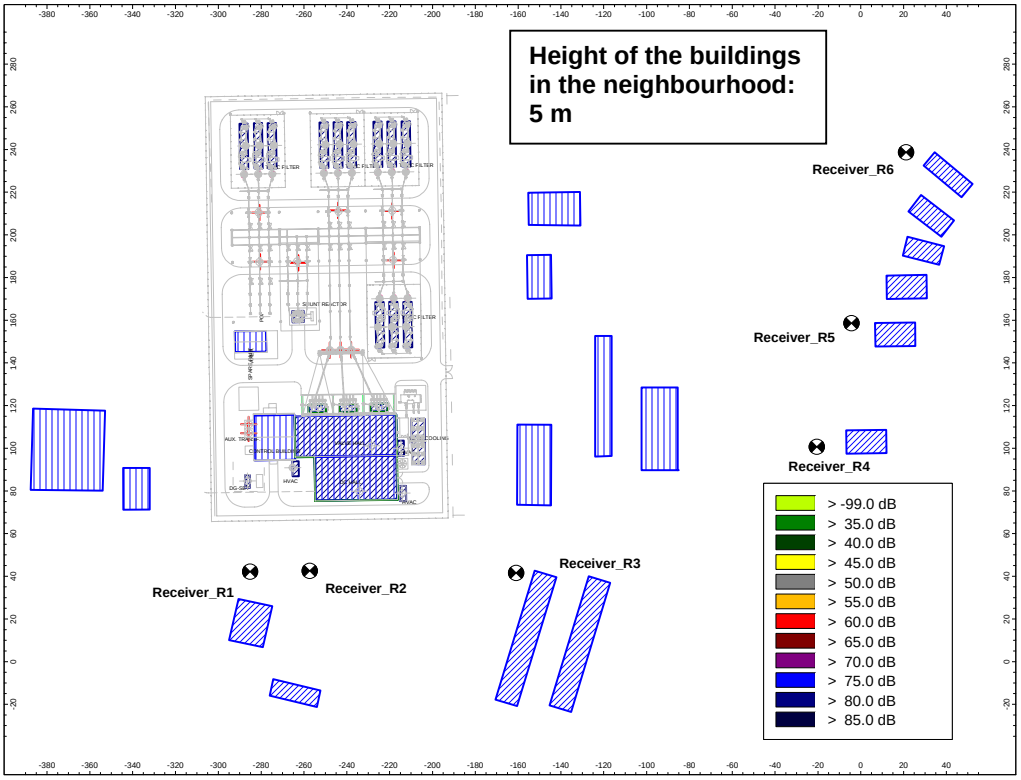


Fig. 1.1: Pittsburg, 10th Street N – S orientation, layout with sound sources and receivers

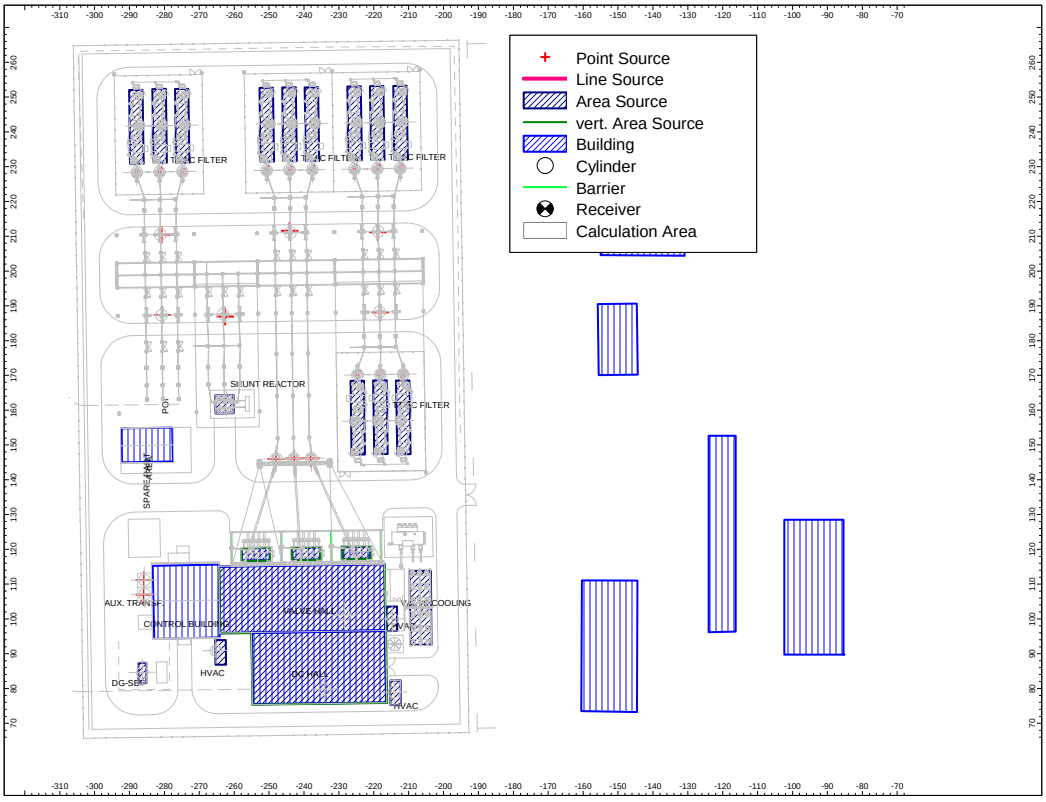


Fig. 1.2: Pittsburg, 10th Street N – S orientation, layout with sound sources

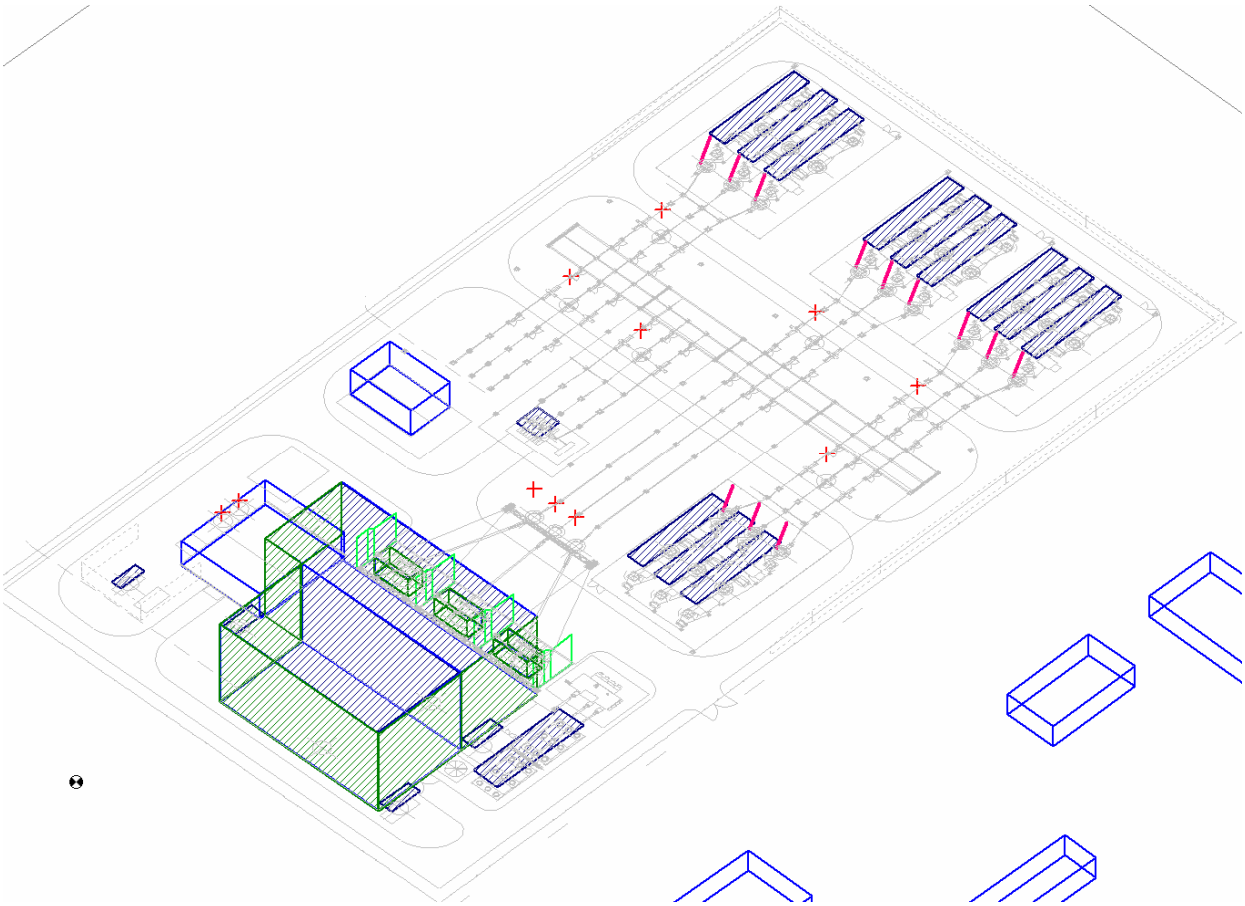


Fig. 1.3: Pittsburg, 10th Street N – S orientation, 3D view

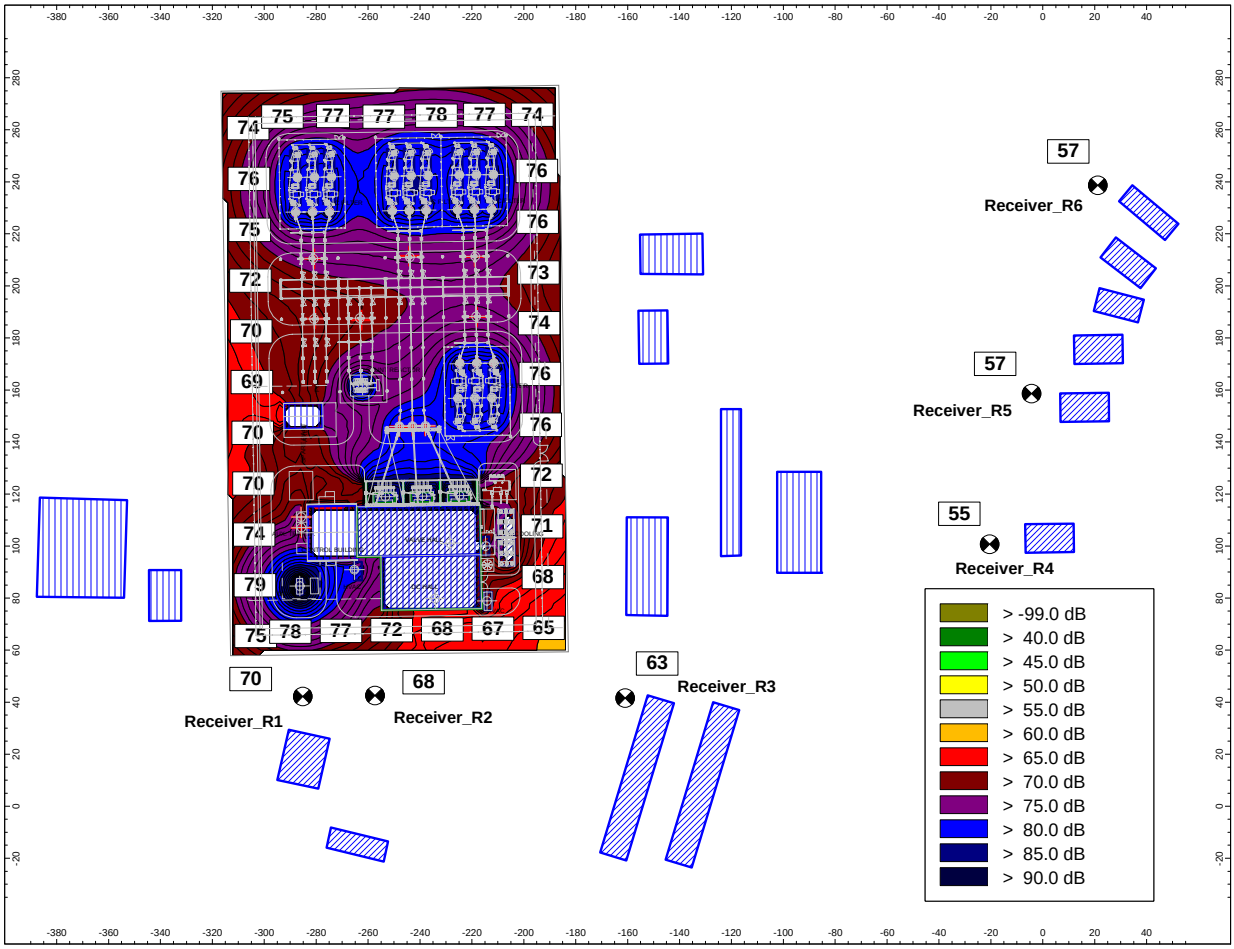


Fig. 1.4: Pittsburg, 10th Street N – S orientation, noise contour map at height of 1,5 m

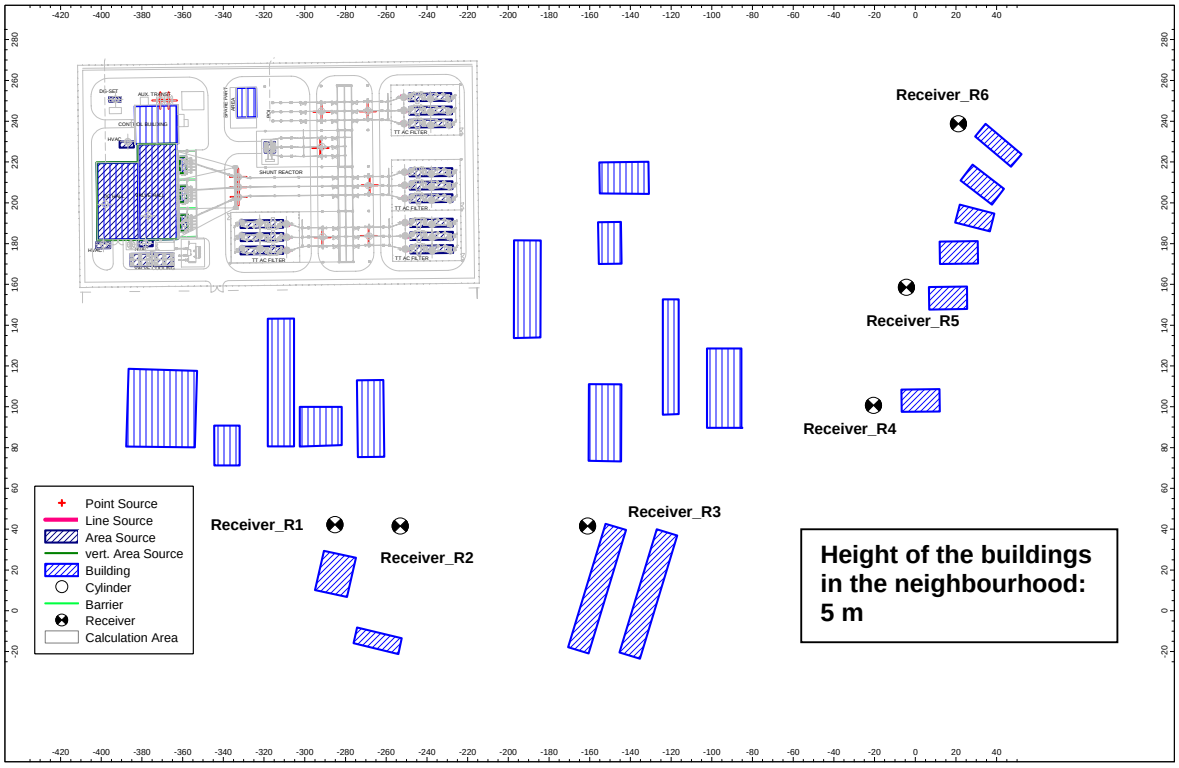


Fig. 2.1: Pittsburg, 10th Street E – W orientation, layout with sound sources and receivers

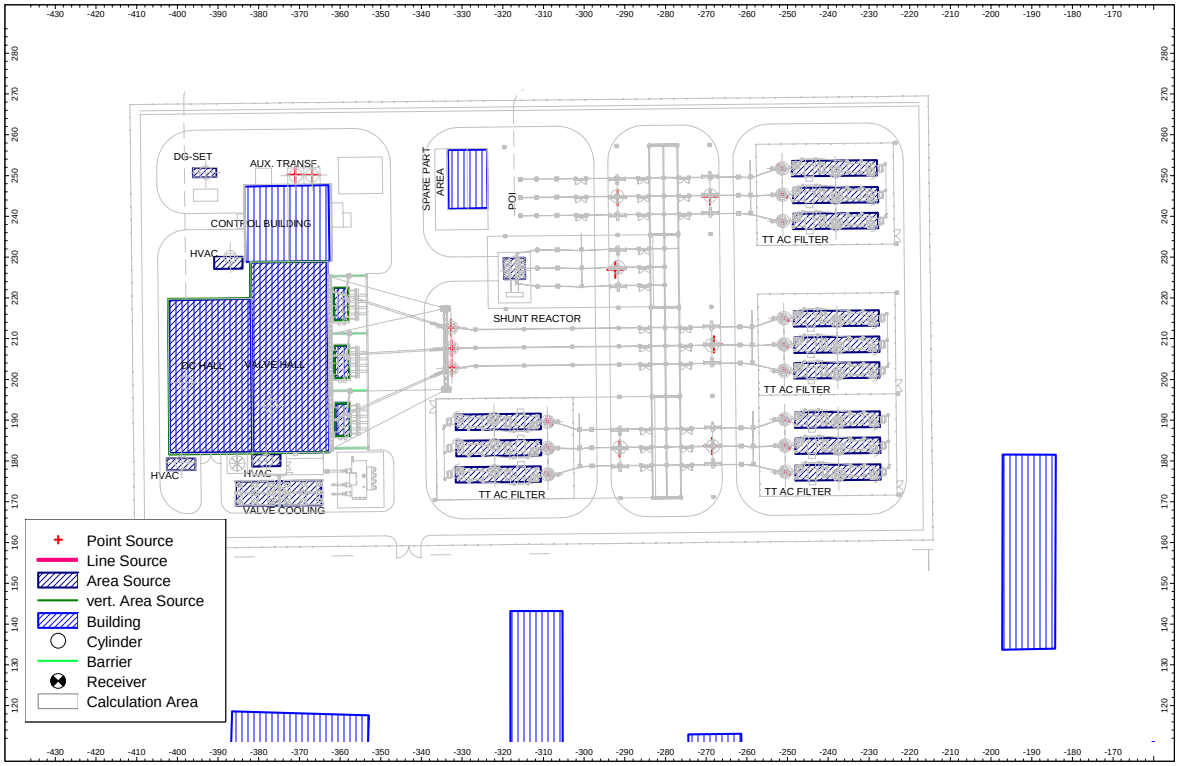


Fig. 2.2: Pittsburg, 10th Street E – W orientation, layout with sound sources

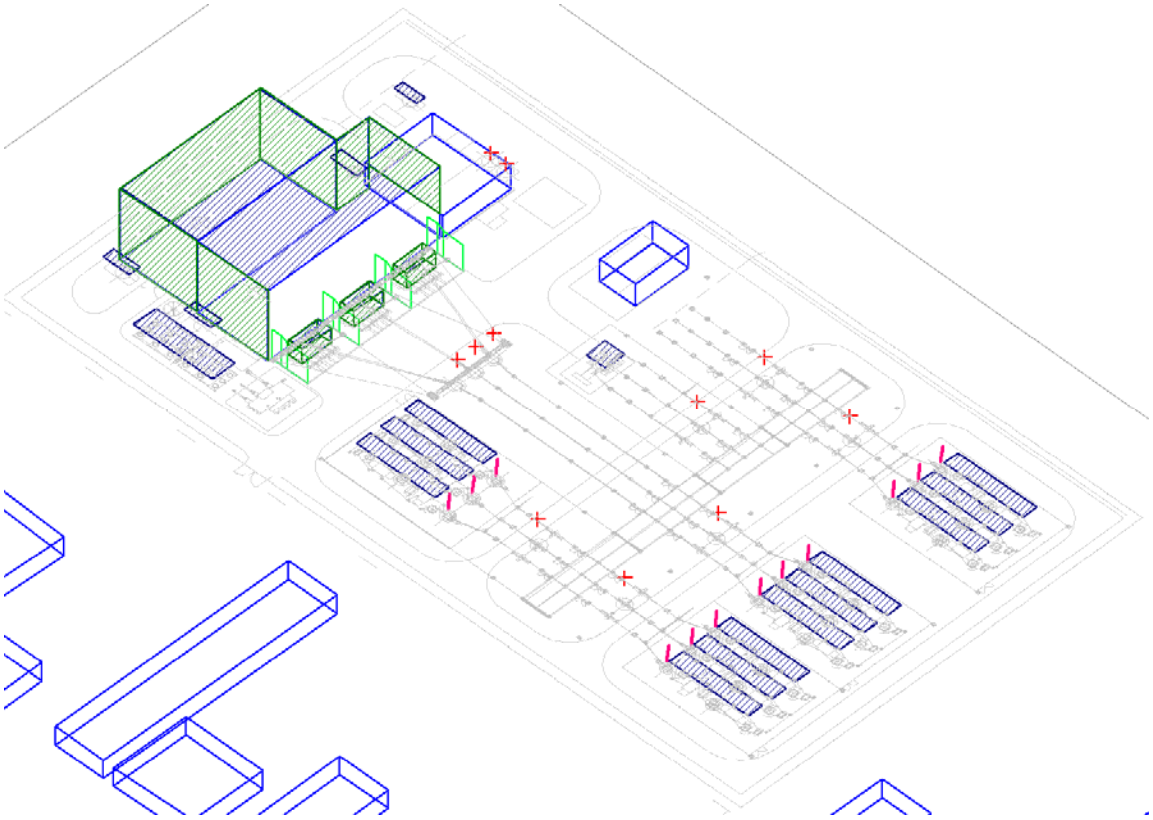


Fig. 2.3: Pittsburg, 10th Street E – W orientation, 3D view

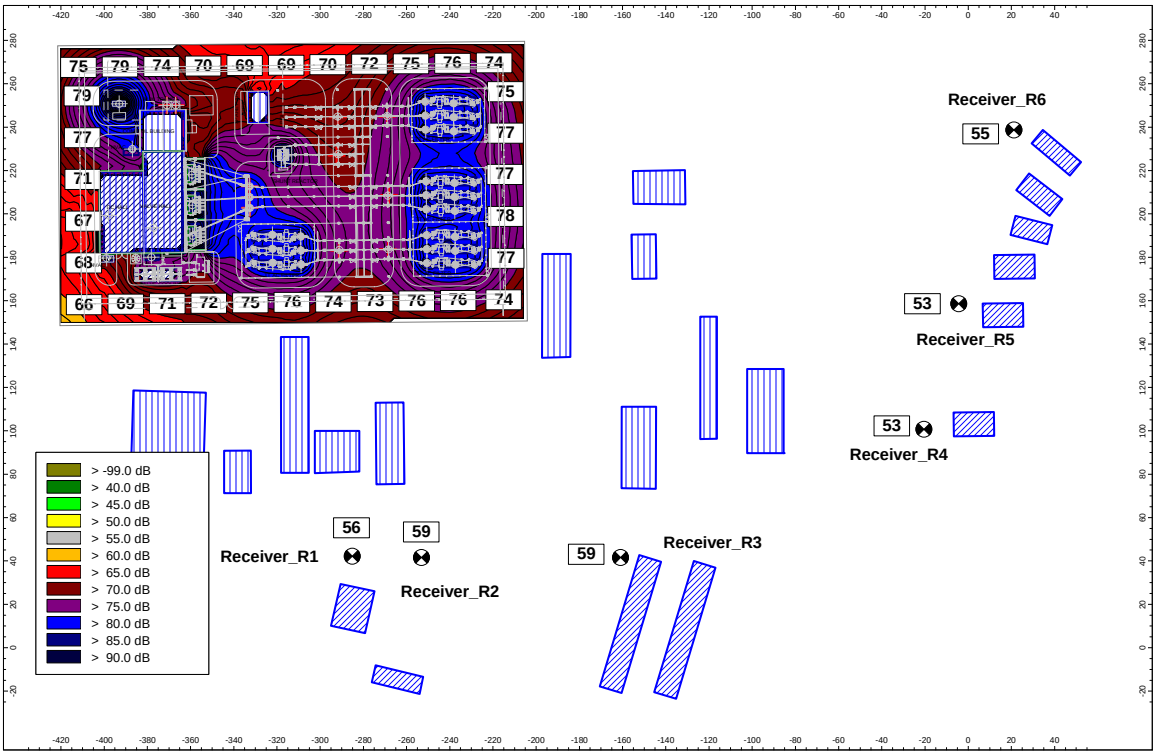


Fig. 2.4: Pittsburg, 10th Street E – W orientation, noise contour map at height of 1,5 m

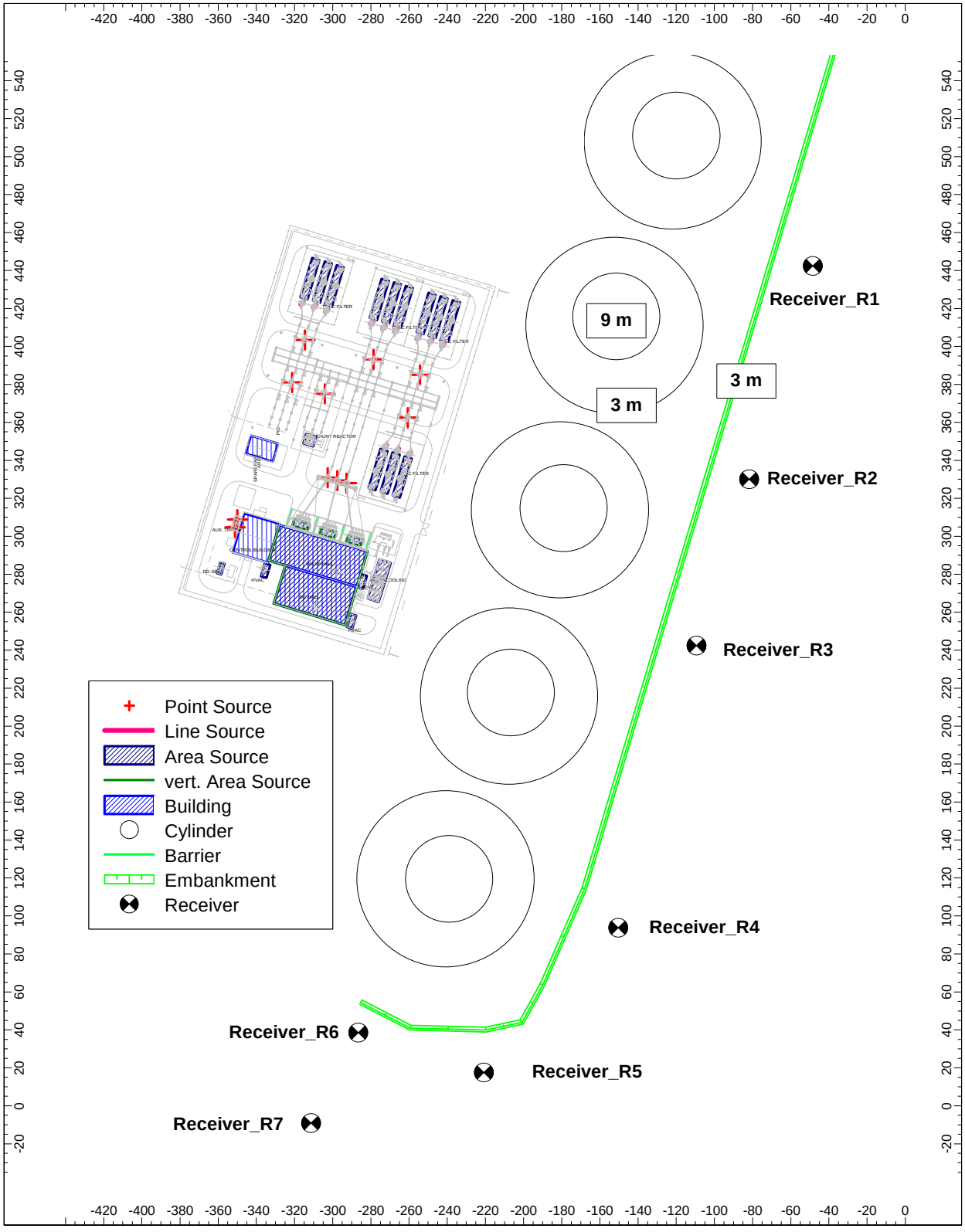


Fig. 3.1: Pittsburg, Mirant, layout with sound sources and receivers

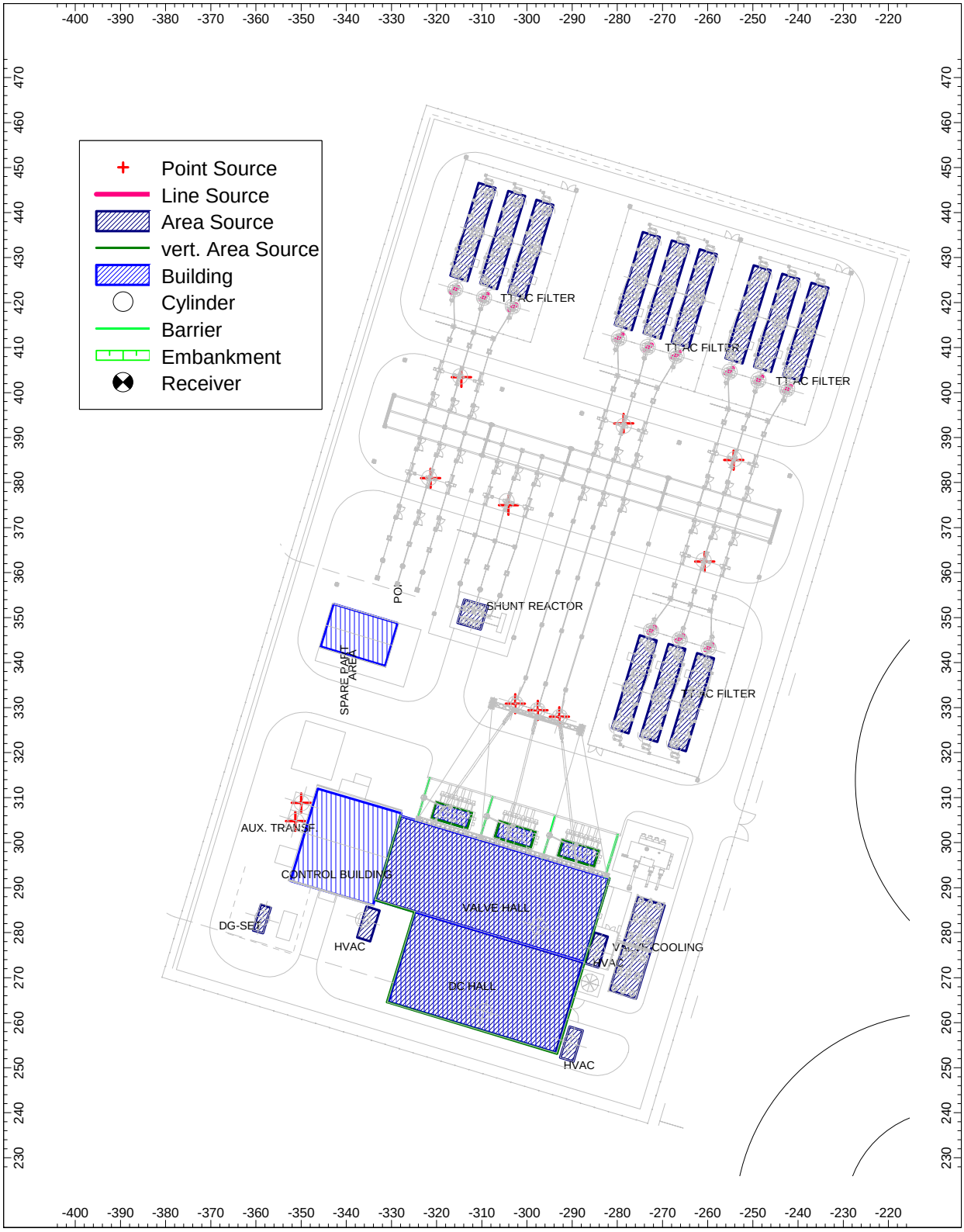


Fig. 3.2: Pittsburg, Mirant, layout with sound sources

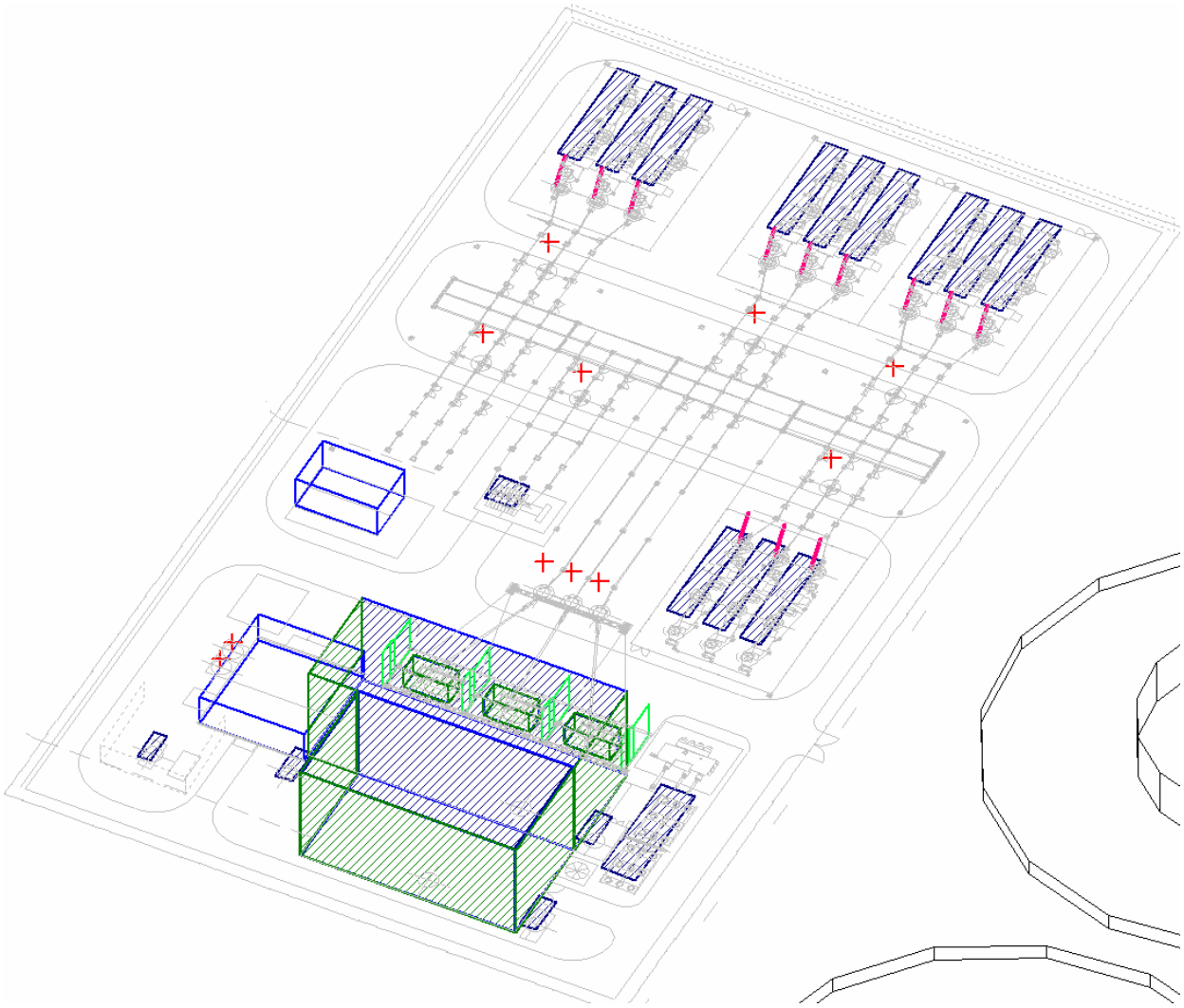


Fig. 3.3: Pittsburg, Mirant, 3D view

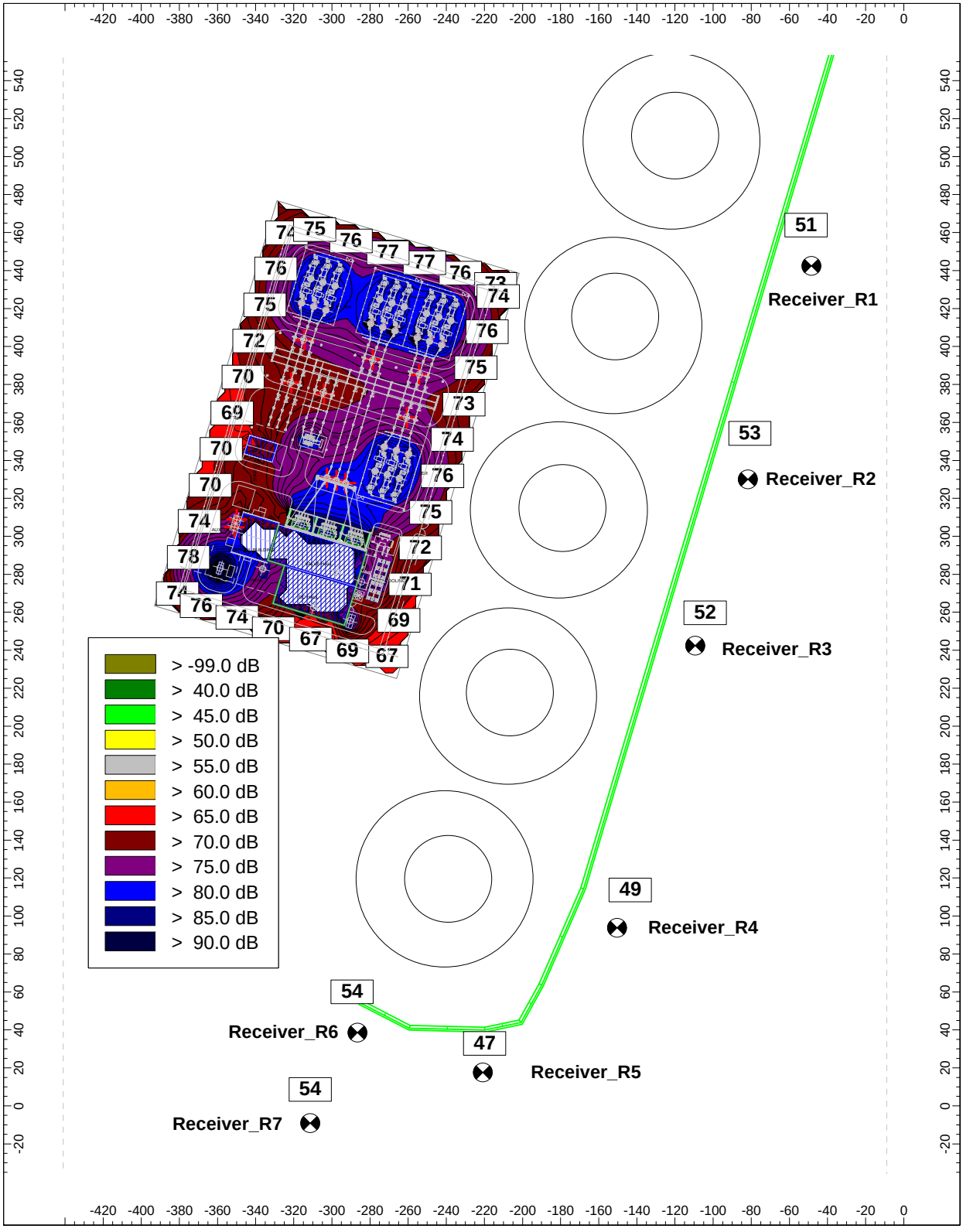


Fig. 3.4: Pittsburg, Mirant, noise contour map at height of 1,5 m

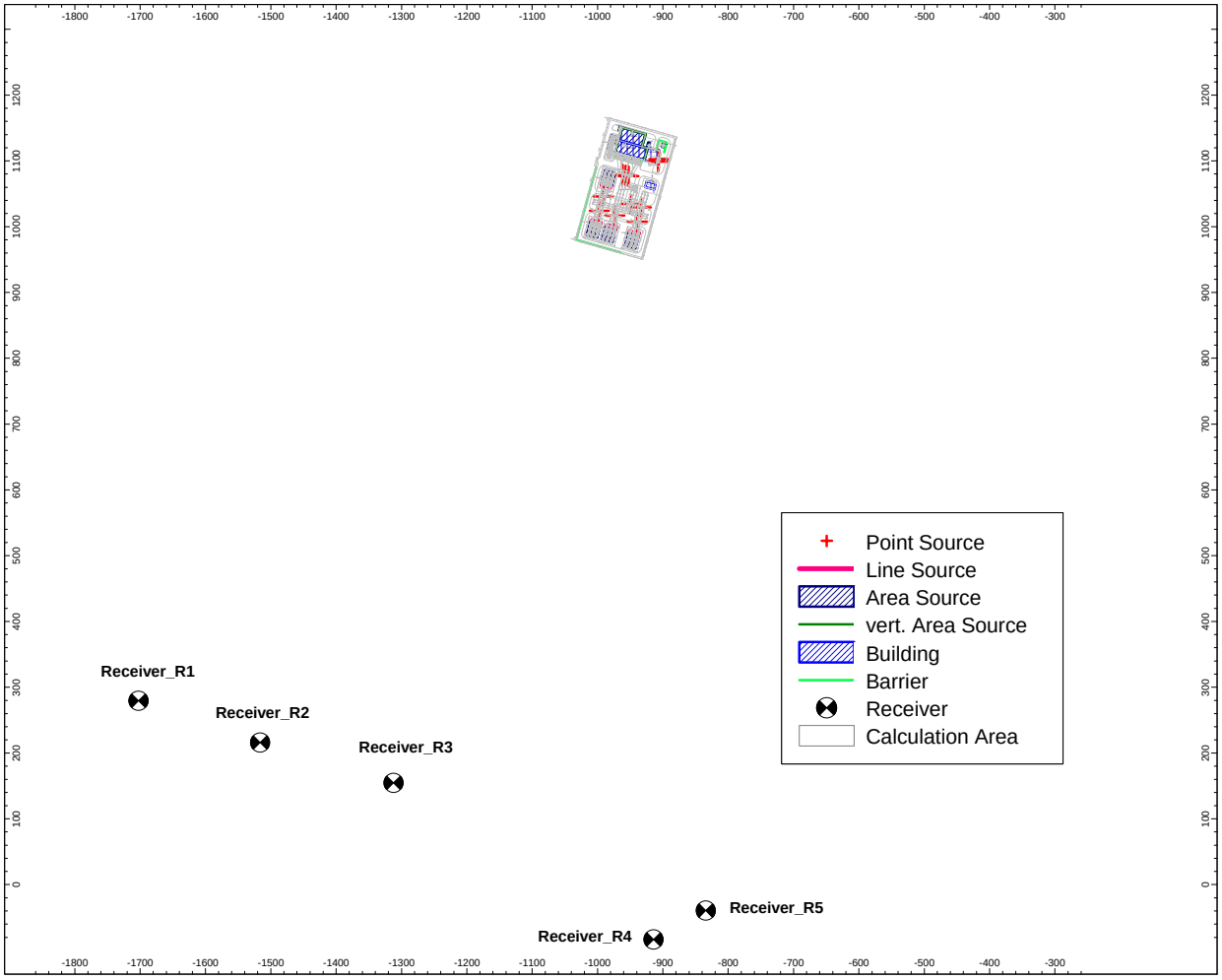


Fig. 4.1: Pittsburg, Standard Oil, layout with sound sources and receivers

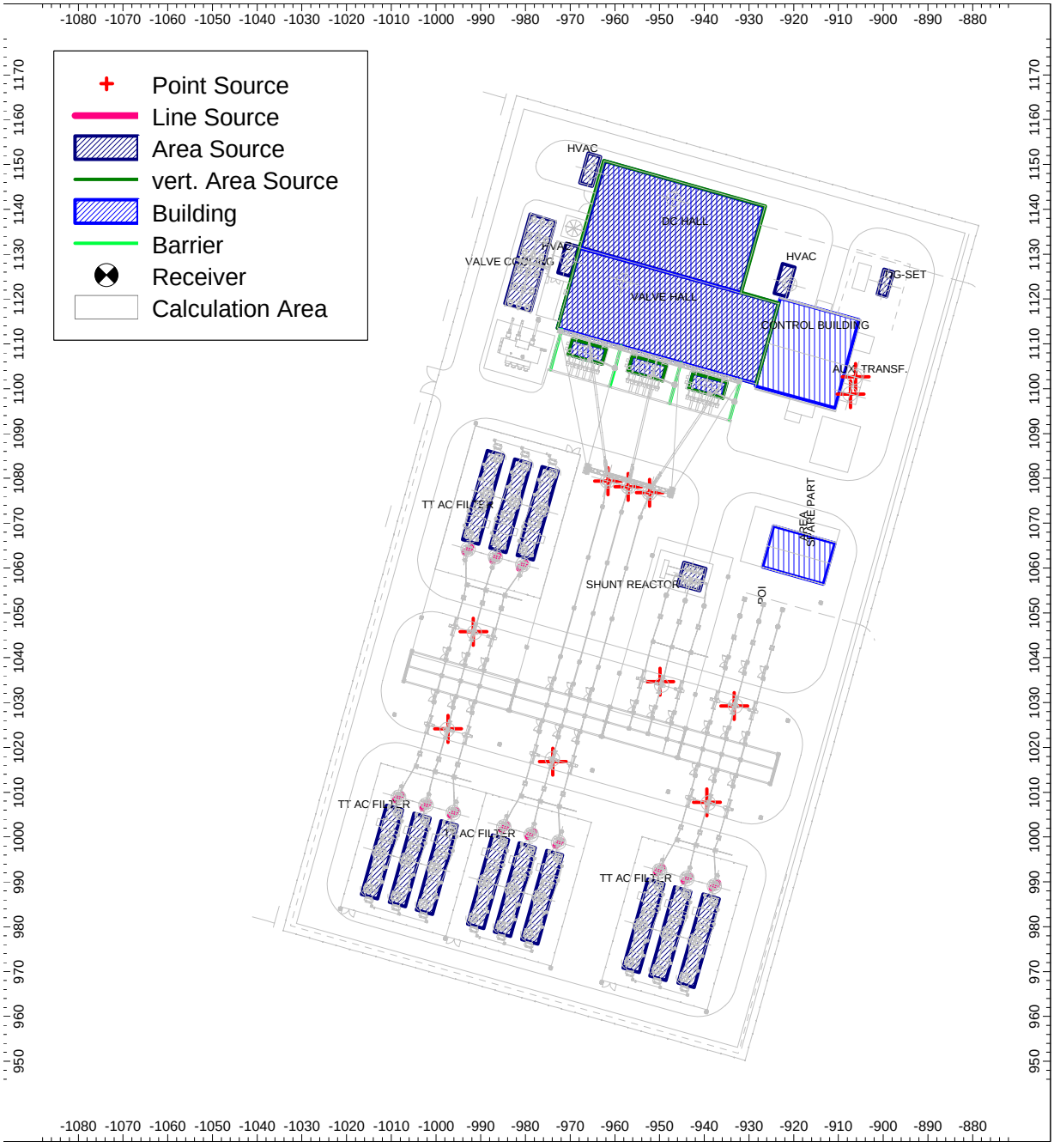


Fig. 4.2: Pittsburg, Standard Oil, layout with sound sources

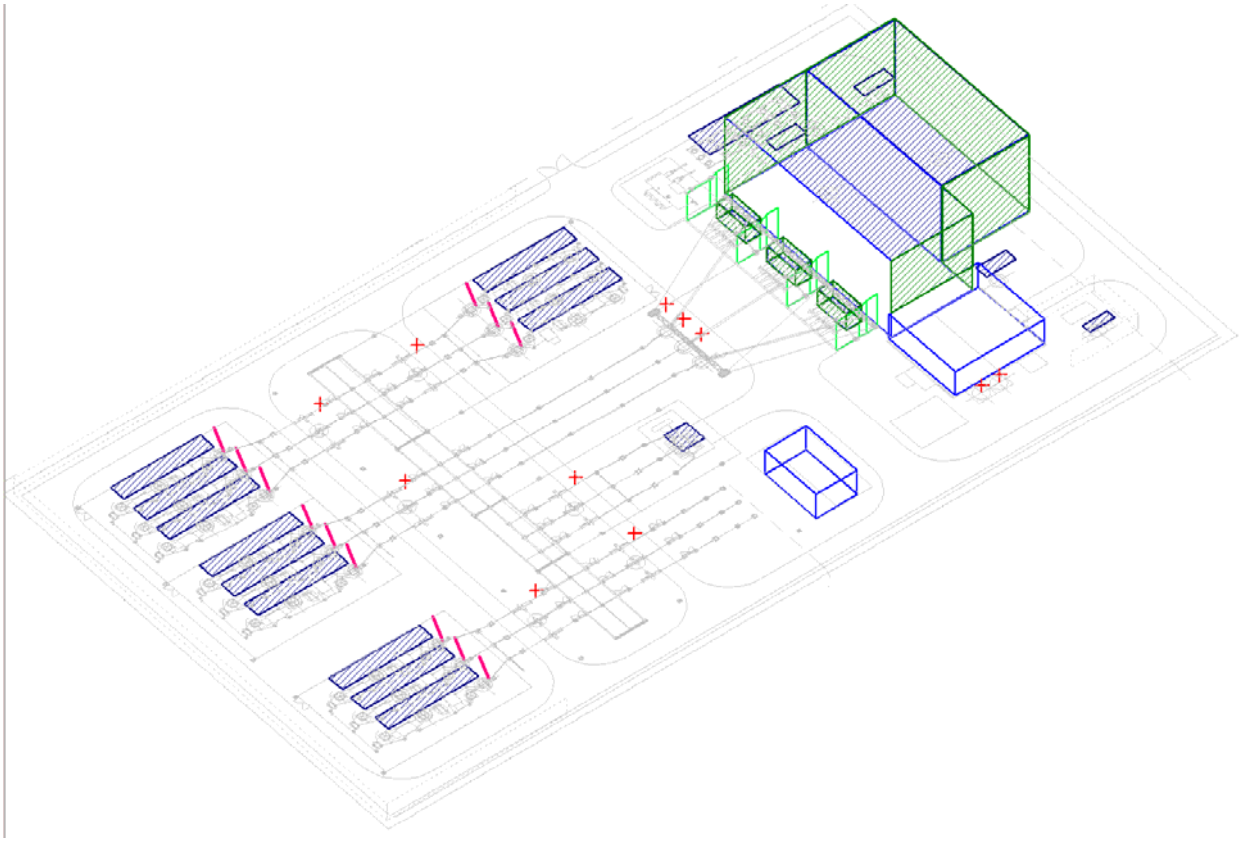


Fig. 4.3: Pittsburg, Standard Oil, 3D view

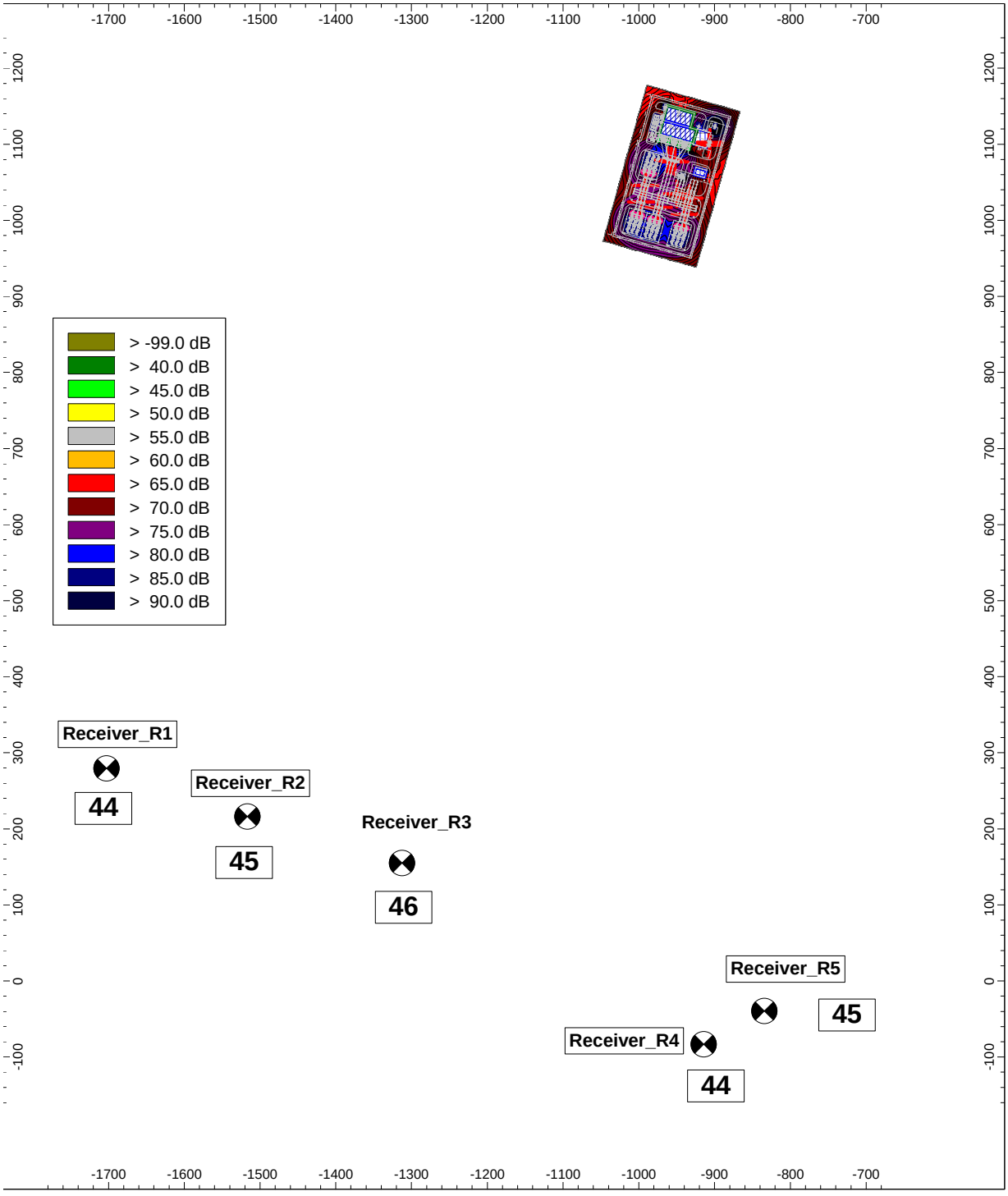


Fig. 4.4: Pittsburg, Standard Oil, noise contour map at height of 1,5 m

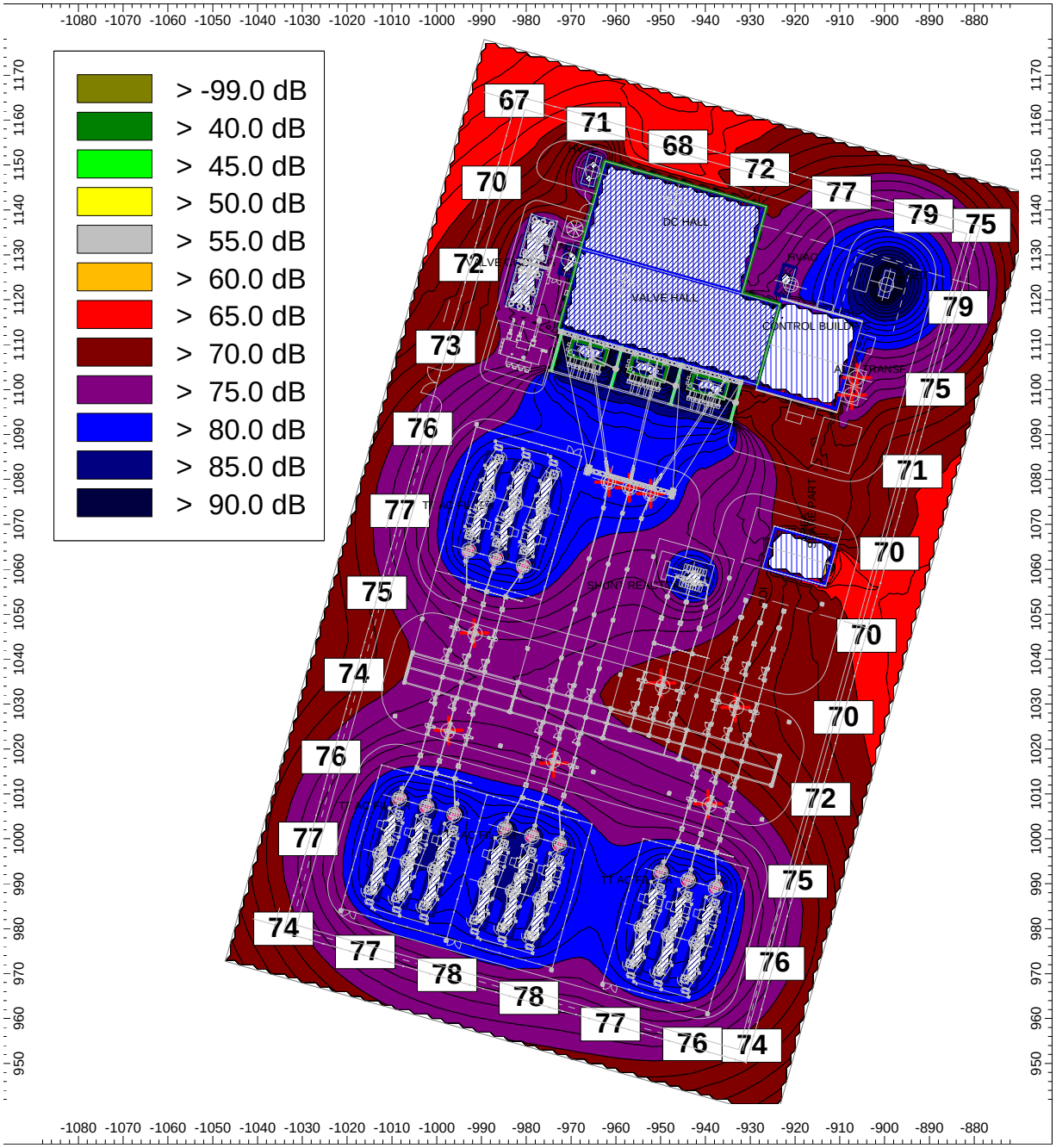
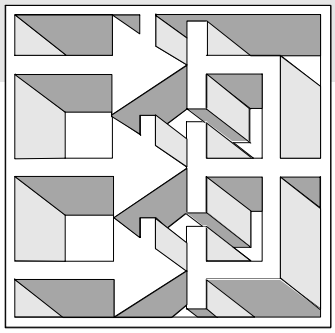


Fig. 4.5: Pittsburg, Standard Oil, noise contour map converter station only, at height of 1,5 m

Trans Bay Cable Project (400 MW)



Preliminary Audible Noise Study
Pittsburg
with Noise Abatement

Rev.	Date	Section	Page	Remarks	Signature
0	02.12.05	all	all	first issue	

1 Audible Noise Study

1.1 Basis

The following report outlines the basis of the audible noise study and how the preliminary audible noise levels at the different alternative Converter Stations have been calculated.

1.1.1 Basis of Acoustical Sound Prediction Calculation

The simplified basic formula of acoustical calculation is:

$$L_{AT}(LT) = L_{WA} + D_c - A_{div} - A_{atm} - A_{gr} - A_{bar} - A - C_{met}$$

The symbols mean (according to DIN EN ISO 9613-2):

$L_{AT}(LT)$: long-term average A-weighted sound pressure level
L_{WA} : A-weighted sound power level of the sound source
D_c : correction for directivity of the source
A_{div} : attenuation due to the geometrical divergence
A_{atm} : attenuation due to air absorption
A_{gr} : attenuation due to ground effects
A_{bar} : the attenuation due to screening (including buildings, land contours, barriers, noise screens, retaining walls and cuttings)
A_{misc} : the attenuation due to other miscellaneous effects (e.g. dense foliage, industrial sites)
C_{met}: meteorological correction

The sound propagation has been calculated with the computer program “Cadna A”, using the international regulation for noise prediction calculation “ISO 9613-2”. The model describes the sound pressure level at a certain distance from the sound source.
The buildings and the fire protection walls of the stations are digitized for the calculation. The building models in the station area are observed as reflectors.
The calculation of the sound power level of the facades of the buildings is in line with VDI 2571.
The sound propagation was determined in octave bands with nominal midband frequencies from 31,5 Hz to 4.000 Hz.
Sound power levels in octave bandwidth levels, distance, heights of imission points and sound sources, walls and reflectors, air absorption, attenuation and reflection caused by walls have been entered into the calculations.
Vegetation has an attenuation effect on sound propagation. However, in this study it was not included because it is assumed that no vegetation is existing at the converter stations.
A flat landscape was assumed in the calculation area of the HVDC Stations and the dwellings nearby. The surounding buildings at 10th Street and the oil stores as well as the embankment to the east of the oil stores at Mirant Power Station have been regarded in the calculation.
The residential area to the east of Mirant Power Station is regarded as on the same level as the converter station.

1.2 Analysis Methodology

All calculations performed in the program are based on standard noise propagation equations. The program calculates the sound pressure level impact from each source for specified points of receivers. These sound levels are combined to obtain the overall substation sound pressure levels and the overall (A-weighted) sound pressure level for each critical imission. The sound level calculation at each individual location also accounts for the height of the receiver and noise blockage due to any interceding barriers, such as terrain or walls.

The location of the sound sources correspond to the arrangement of the equipment according to the preliminary station layout of the Converter Stations.

1.3 Audible Noise Level Limits

The allowable audible noise levels are according table 1:

		Pittsburg
Measuring unit		dB(A), Ldn 24h average, 10 dB penalty between 22:00h - 07:00h
Limit at property line **10th Street** site	dB(A)	• north 75 • east, 75 • west 75 • south, n.a.
Limit at property line **Mirant** site	dB(A)	• north 75 • east, n.a • west 75 • south, n.a.
Limit at property line **Standard Oil** site	dB(A)	• all directions 75
Receivers at **10th Street** site	dB(A)	• south 60, residences, IO1, IO2, IO3 • east 60, residences, IO4, IO5, IO6
Receivers at **Mirant** site	dB(A)	• south 70, park, IO5, IO6, IO7 • east 60, residences, IO1, IO2, IO3, IO4
Receivers at **Standard Oil** site	dB(A)	• south 60, residences, IO1 – IO5
Ambient noise		not to be considered for limit
Height of measuring / calculation	m	1,5

Tab. 1: Audible noise limits

1.4 Noise Reduction Measures

The preliminary audible noise study for the different Pittsburg converter station sites/alternatives has shown that the audible noise limits according to item 1.3 can only be met taking different audible noise attenuation measures into consideration.

1.4.1 10th Street site, N - S orientation

In order to reach the specified audible noise limits the measures according to table 2.1. are proposed.

Area	Noise reduction measures
Valve Hall, DC Hall	Sound damping facades for walls oriented to the south and to the west
Emergency Diesel Generator	Sound damping wall around the generator in U - formation, height 4m
AC - Filters	Sound damping wall at property line (AC-Filter Area), height 3m

Tab. 2.1: 10th Street site, N - S orientation, audible noise reduction measures

1.4.2 10th Street site, E - W orientation

In order to reach the specified audible noise limits the measures according to table 2.2. are proposed.

Area	Noise reduction measures
Emergency Diesel Generator	Sound damping wall around the generator in U - formation, height 4m
AC – Filters	Sound damping wall at property line (AC-Filter Area), height 3m

Tab. 2.2: 10th Street site, E - W orientation, audible noise reduction measures

1.4.3 Mirant site

In order to reach the specified audible noise limits the measures according the table 2.3. are proposed.

Area	Noise reduction measures
Emergency Diesel Generator	Sound damping wall around the generator in U - formation, height 4m
AC – Filters	Sound damping wall at property line (AC-Filter Area), height 3m

Tab. 2.3: Mirant site, audible noise reduction measures

1.4.4 Standard Oil site

In order to reach the specified audible noise limits the measures according to table 2.4. are proposed.

Area	Noise reduction measures
Emergency Diesel Generator	Sound damping wall around the generator in U - formation, height 4m
AC – Filters	Sound damping wall at property line (AC-Filter Area), height 3m

Tab. 2.4: Standard Oil site, audible noise reduction measures

1.5 Analysis Results

Based on the preliminary layout (rectangular configuration) and preliminary audible noise levels for the respective components and taking the noise attenuation measures acc. to item 1.4 into account the analysis was done for the four different converter station sites/alternatives.

1.5.1 10th Street site, N - S orientation

The layout and location of sound sources and receivers is shown in Fig. 1.1, 1.2 and 1.3. The calculated sound pressure at the property lines and the receivers is indicated in Fig. 1.4. The maximum sound pressure values are calculated as:

	Max. calculated audible noise level [dB(A)]
north property line	74
east property line	72
west property line	72
south property line	n.a.
Receivers	60 (R1, R2 and R3)

which is within the limits specified.

1.5.2 10th Street site, E - W orientation

The layout and location of sound sources and receivers is shown in Fig. 2.1, 2.2 and 2.3. The calculated sound pressure at the property lines and the receivers is indicated in Fig. 2.4. The maximum sound pressure values are calculated as:

	Max. calculated audible noise level [dB(A)]
north property line	72
east property line	74
west property line	68
south property line	n.a.
Receivers	56 (R1 and R2)

which is within the limits specified.

1.5.3 Mirant site

The layout and location of sound sources and receivers is shown in Fig. 3.1, 3.2 and 3.3. The calculated sound pressure at the property lines and the receivers is indicated in Fig. 3.4. The maximum sound pressure values are calculated as:

	Max. calculated audible noise level [dB(A)]
north property line	74
east property line	n.a.
west property line	73
south property line	n.a.
Receivers	53 (R2)

which is within the limits specified.

1.5.4 Standard Oil site

The layout and location of sound sources and receivers is shown in Fig. 4.1, 4.2 and 4.3. The calculated sound pressure at the receivers is indicated in Fig. 4.4 and the calculated sound pressure at the property lines is indicated in Fig. 4.5. The maximum sound pressure values are calculated as:

	Max. calculated audible noise level [dB(A)]
north property line	71
east property line	73
west property line	74
south property line	74
Receivers	42 (R3)

which is within the limits specified.

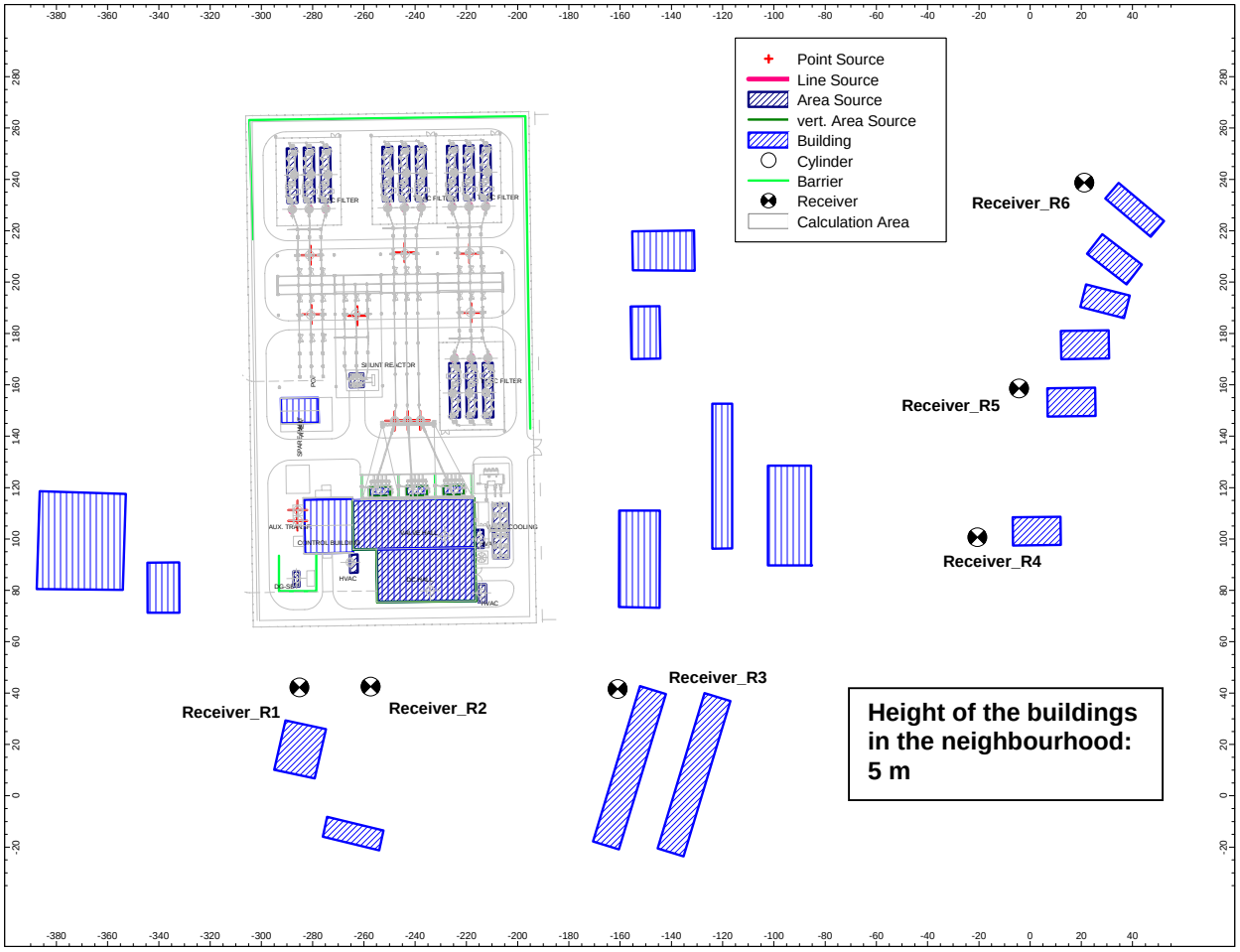


Fig. 1.1: Pittsburg, 10th Street N – S orientation, layout with sound sources and receivers

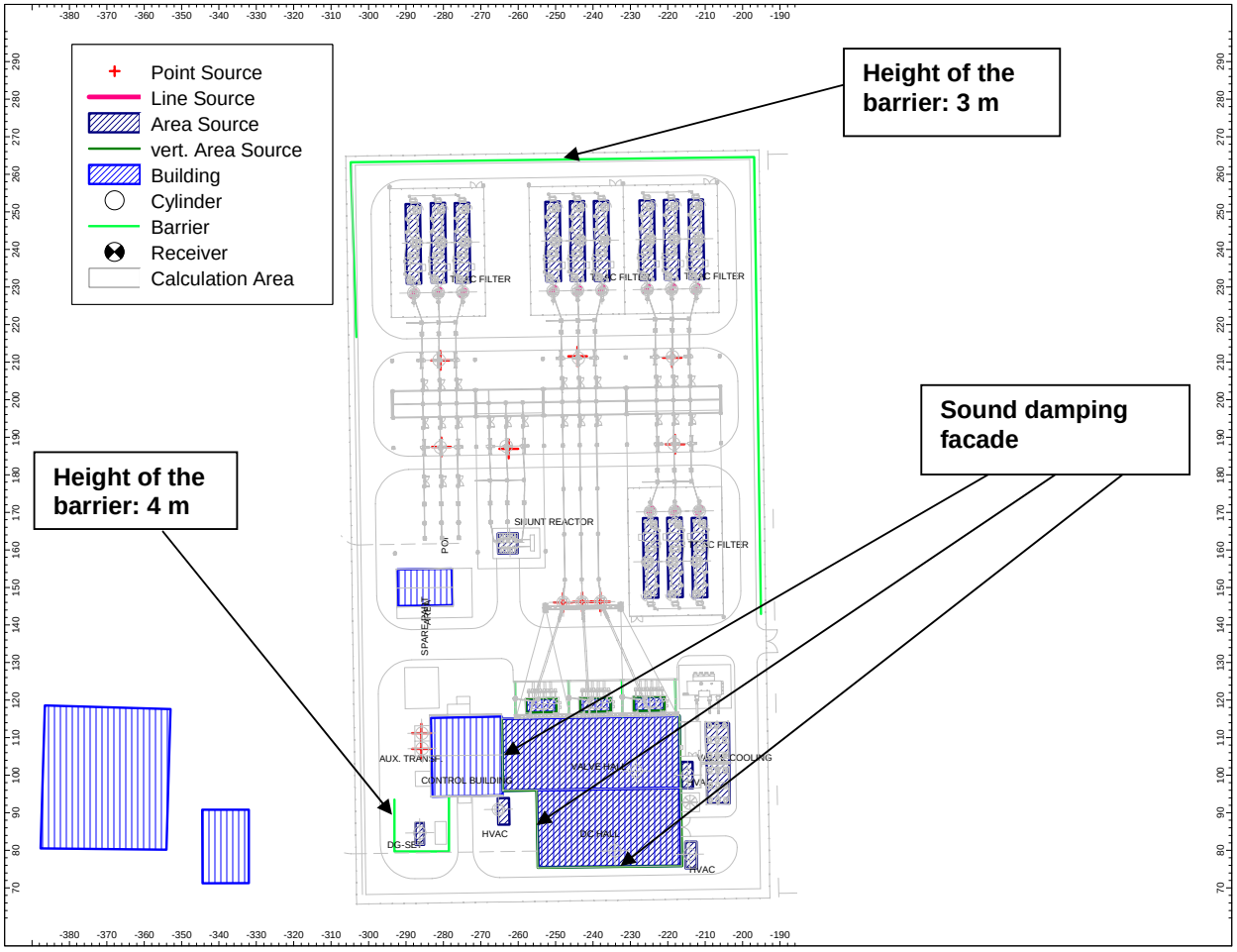


Fig. 1.2: Pittsburg, 10th Street N – S orientation, layout with sound sources

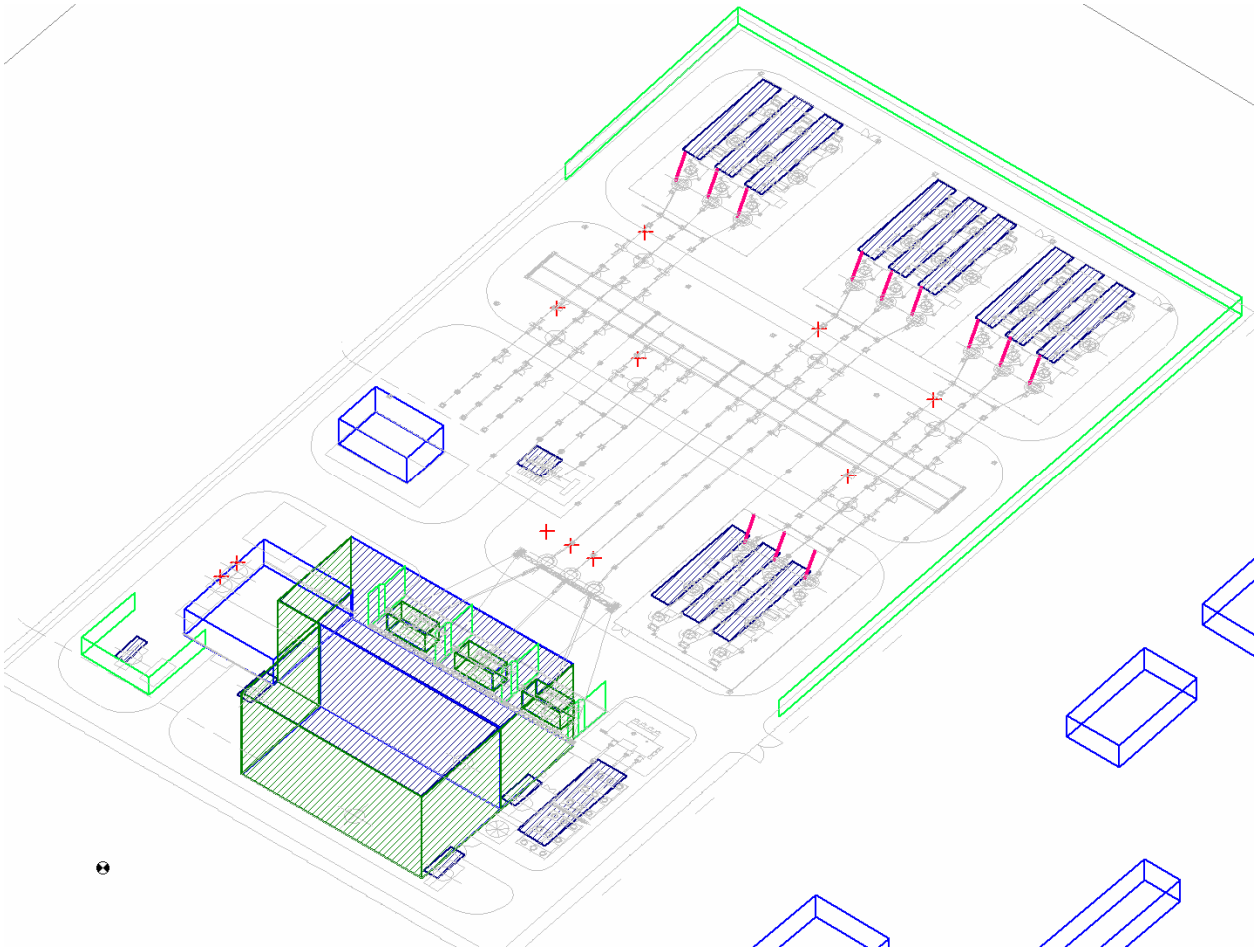


Fig. 1.3: Pittsburg, 10th Street N – S orientation, 3D view

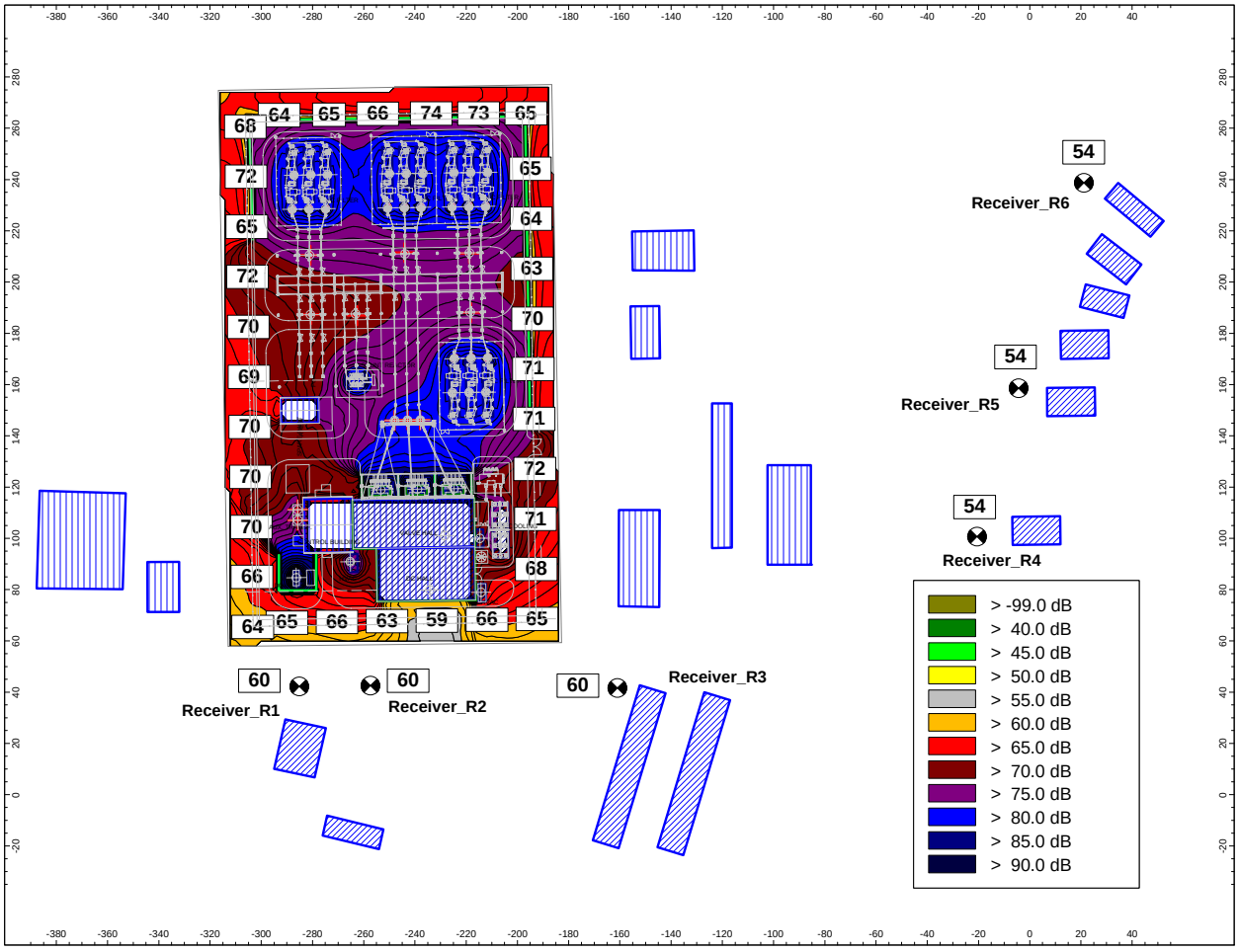


Fig. 1.4: Pittsburg, 10th Street N – S orientation, noise contour map at height of 1,5 m

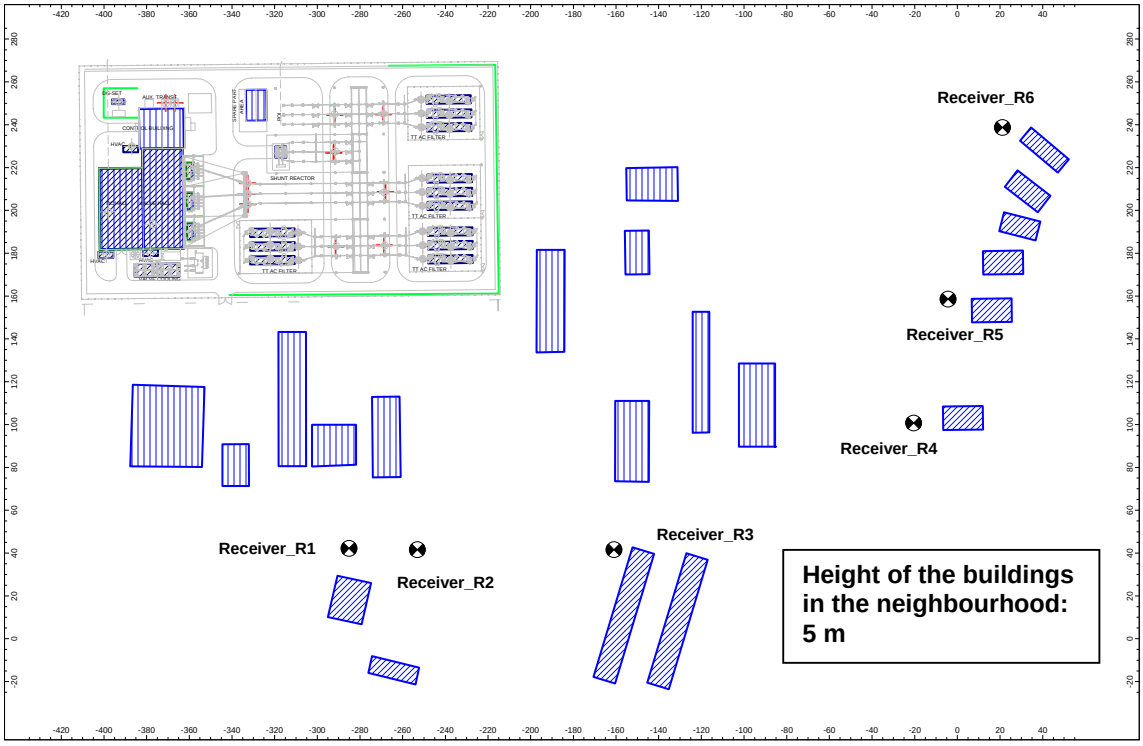


Fig. 2.1: Pittsburg, 10th Street E – W orientation, layout with sound sources and receivers

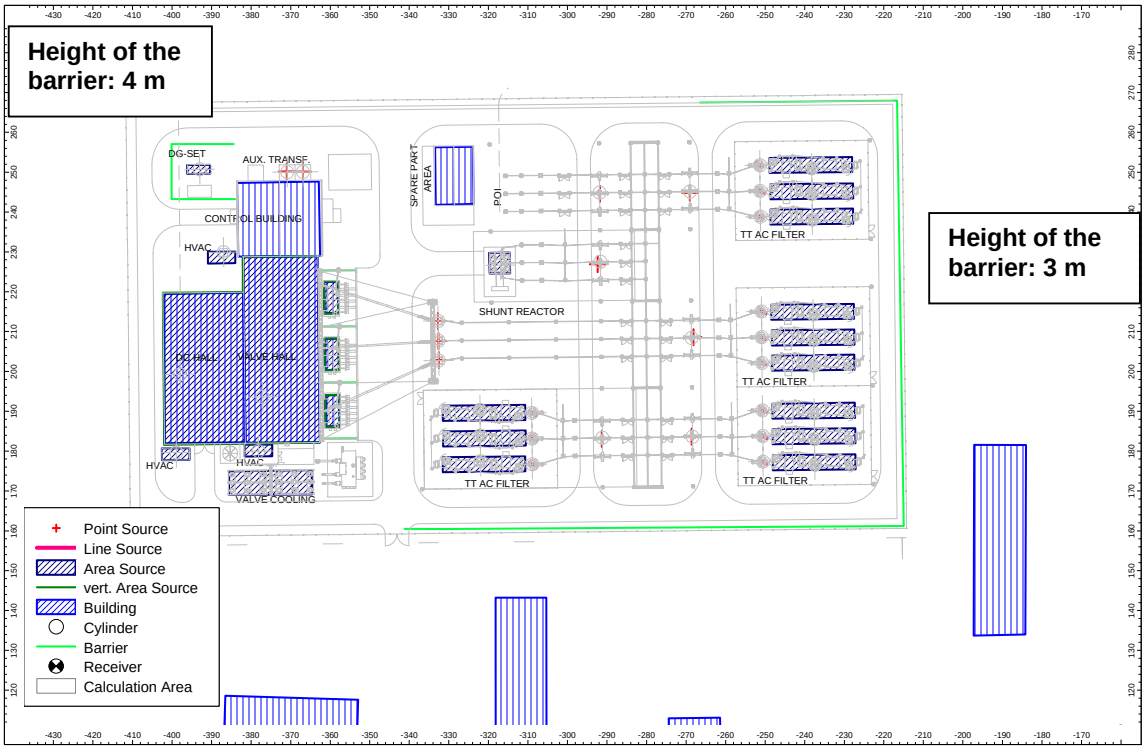


Fig. 2.2: Pittsburg, 10th Street E – W orientation, layout with sound sources

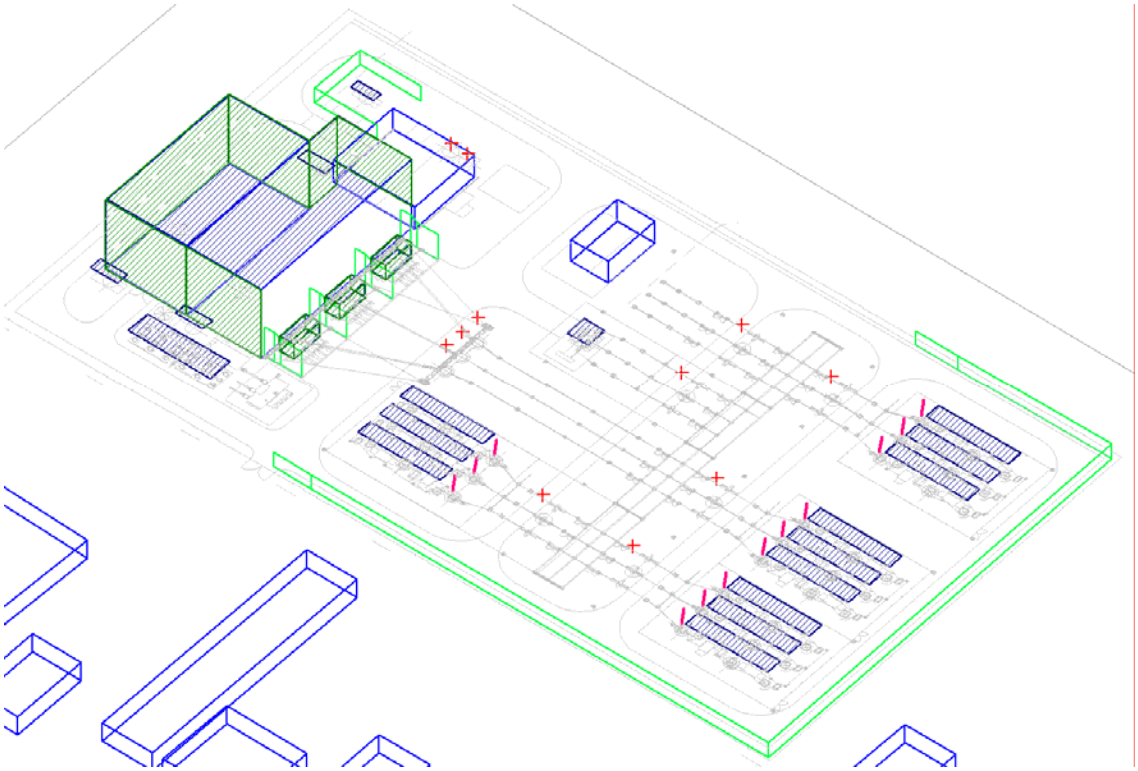


Fig. 2.3: Pittsburg, 10th Street E – W orientation, 3D view

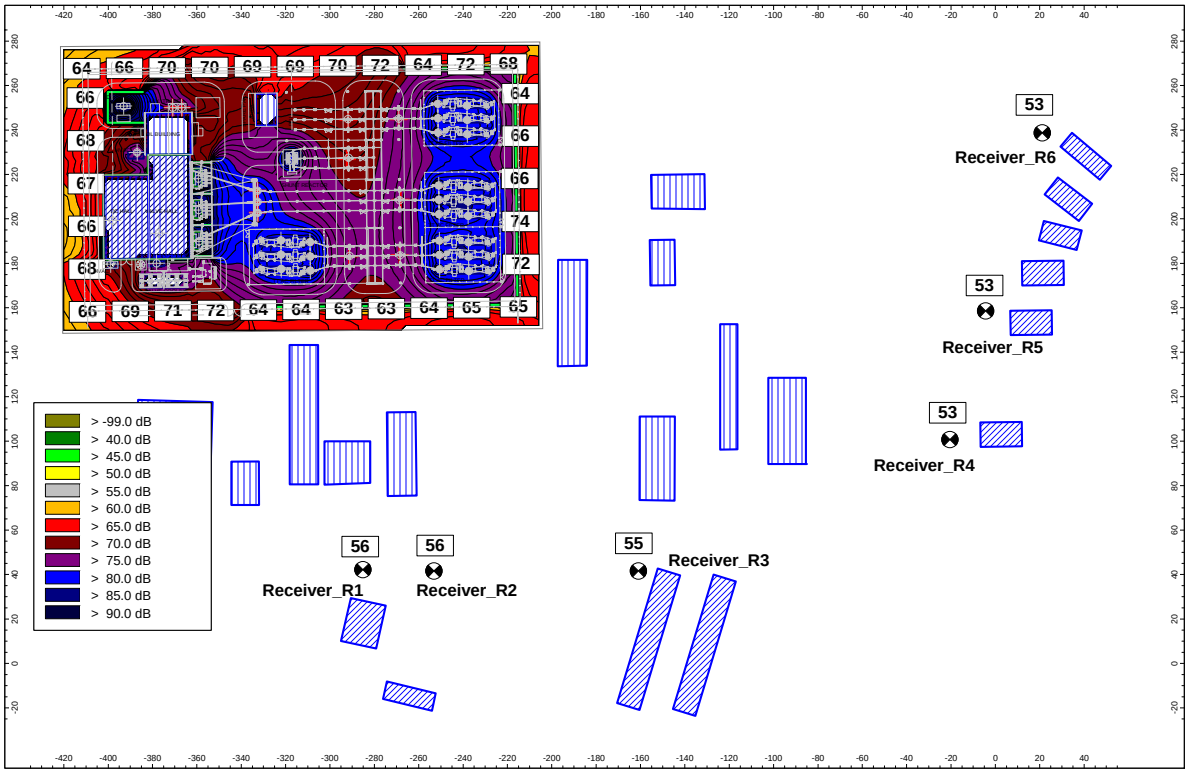


Fig. 2.4: Pittsburg, 10th Street E – W orientation, noise contour map at height of 1,5 m

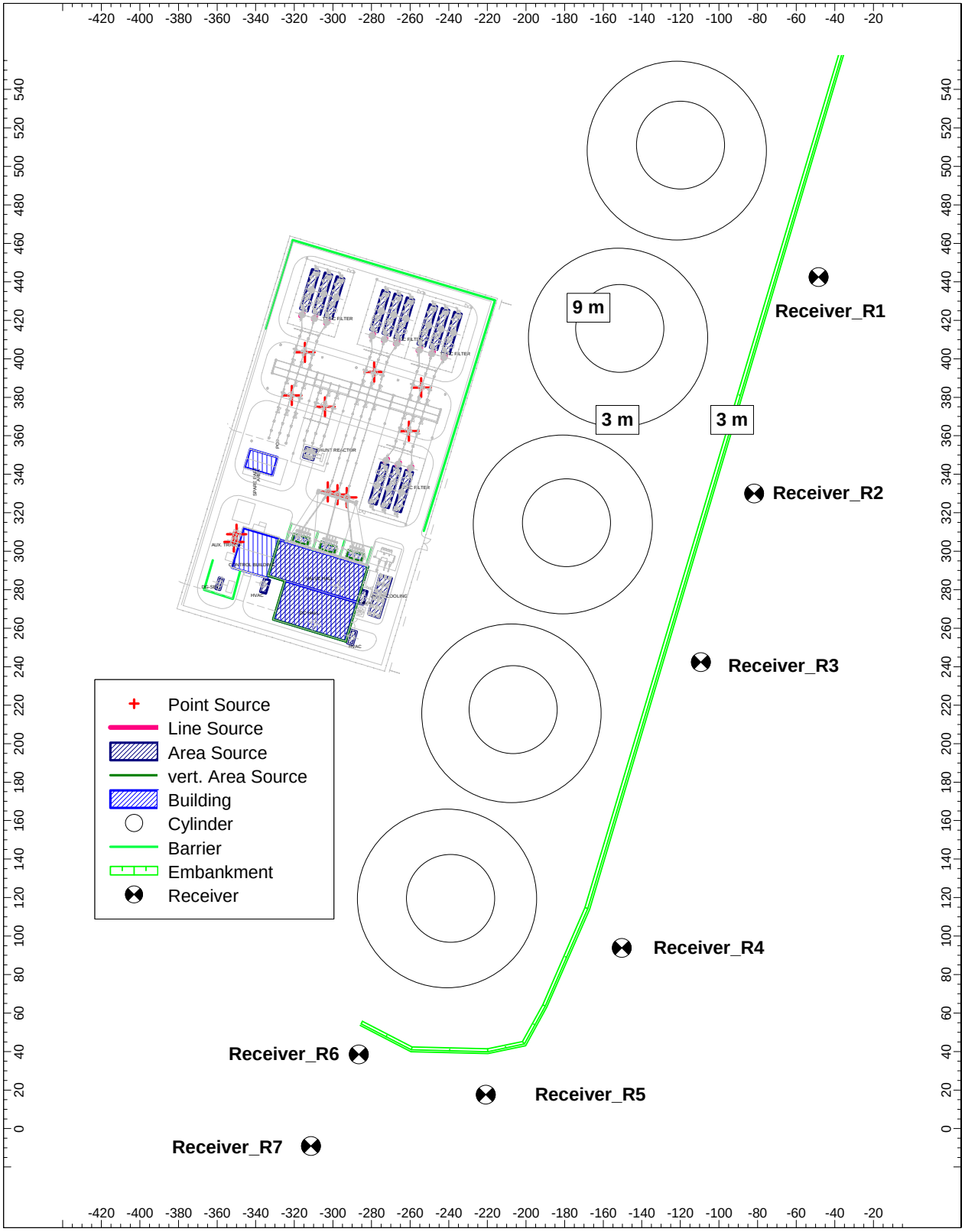


Fig. 3.1: Pittsburg, Mirant, layout with sound sources and receivers

Fig. 3.2: Pittsburg, Mirant, layout with sound sources

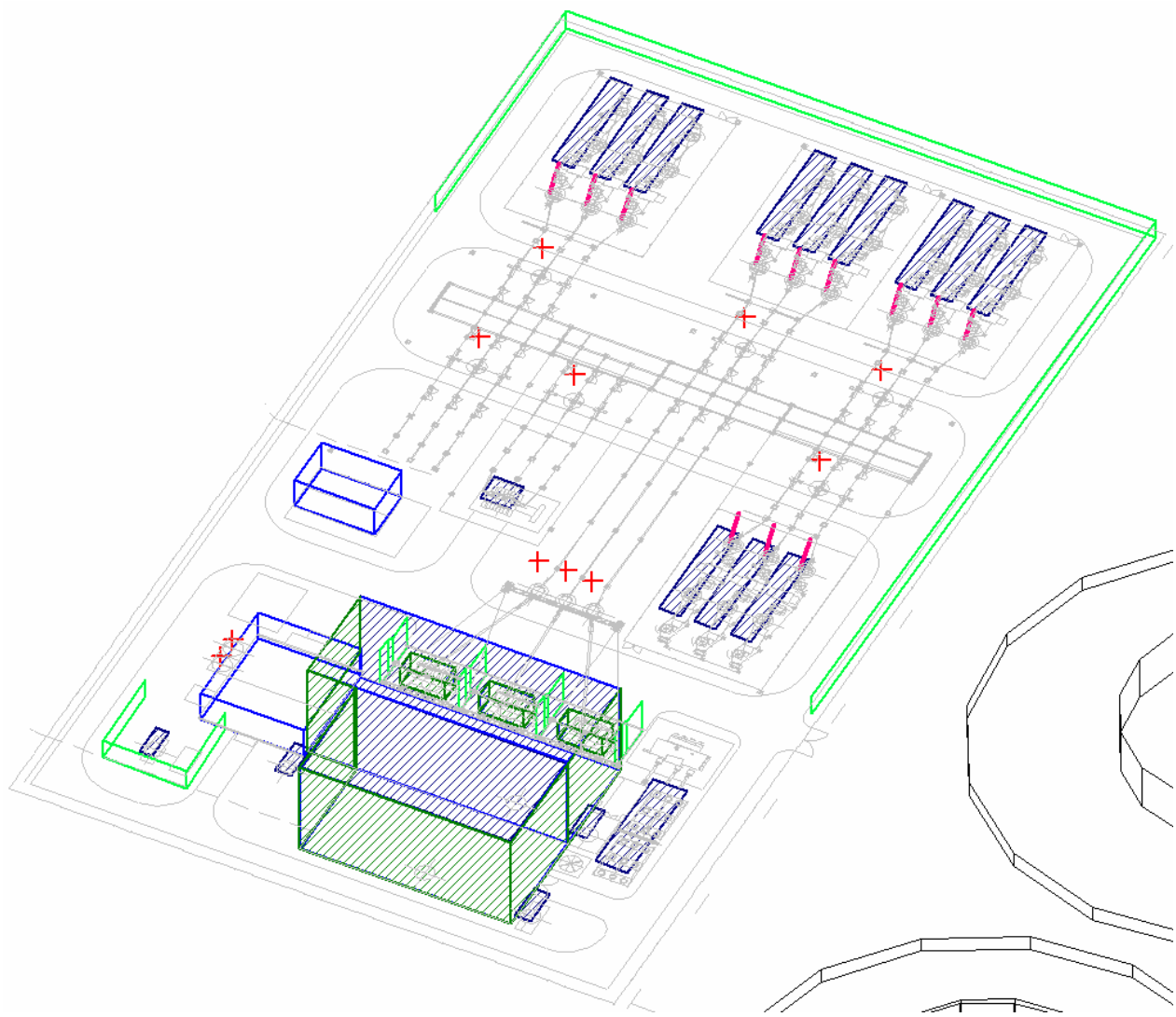


Fig. 3.3: Pittsburg, Mirant, 3D view

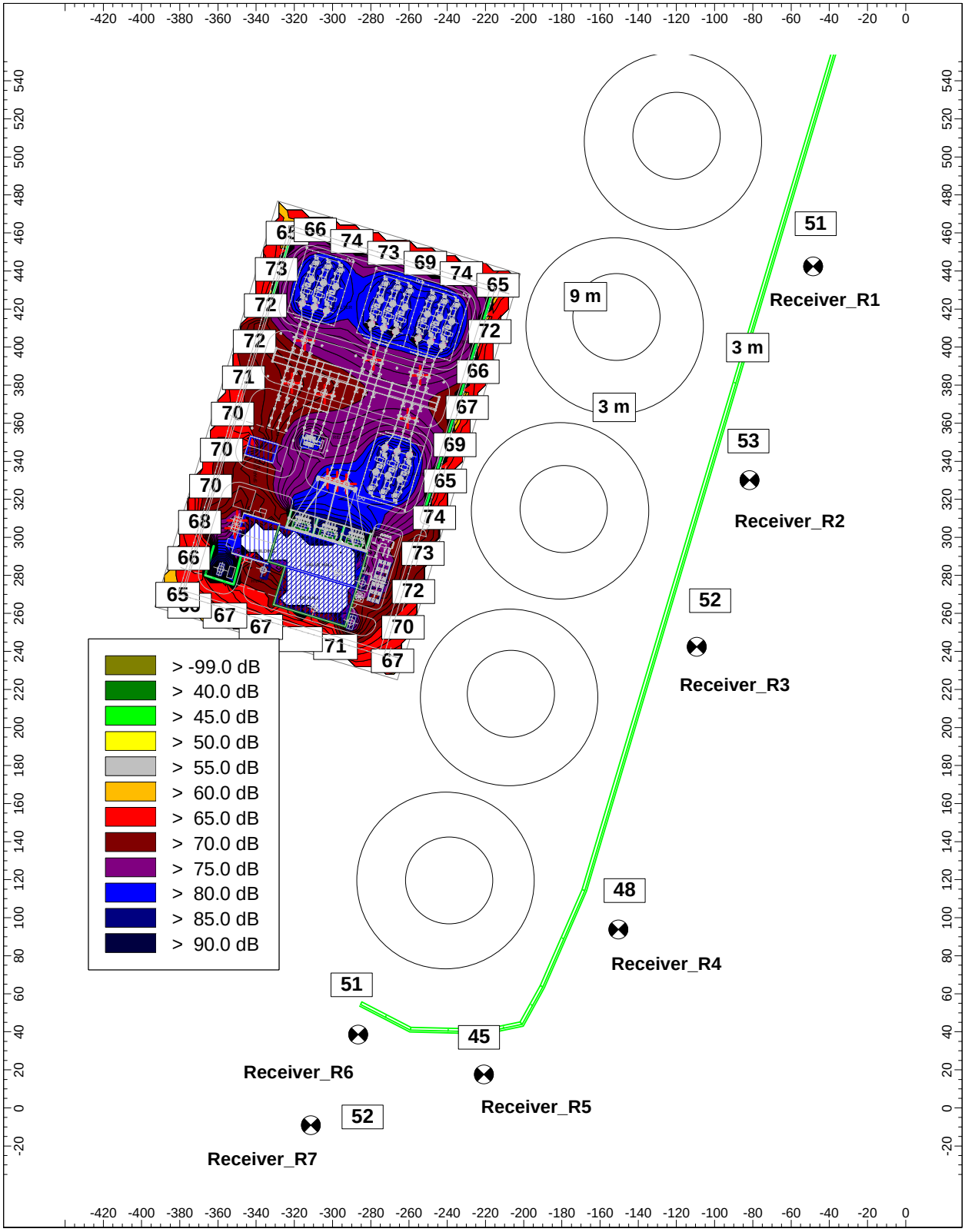


Fig. 3.4: Pittsburg, Mirant, noise contour map at height of 1,5 m

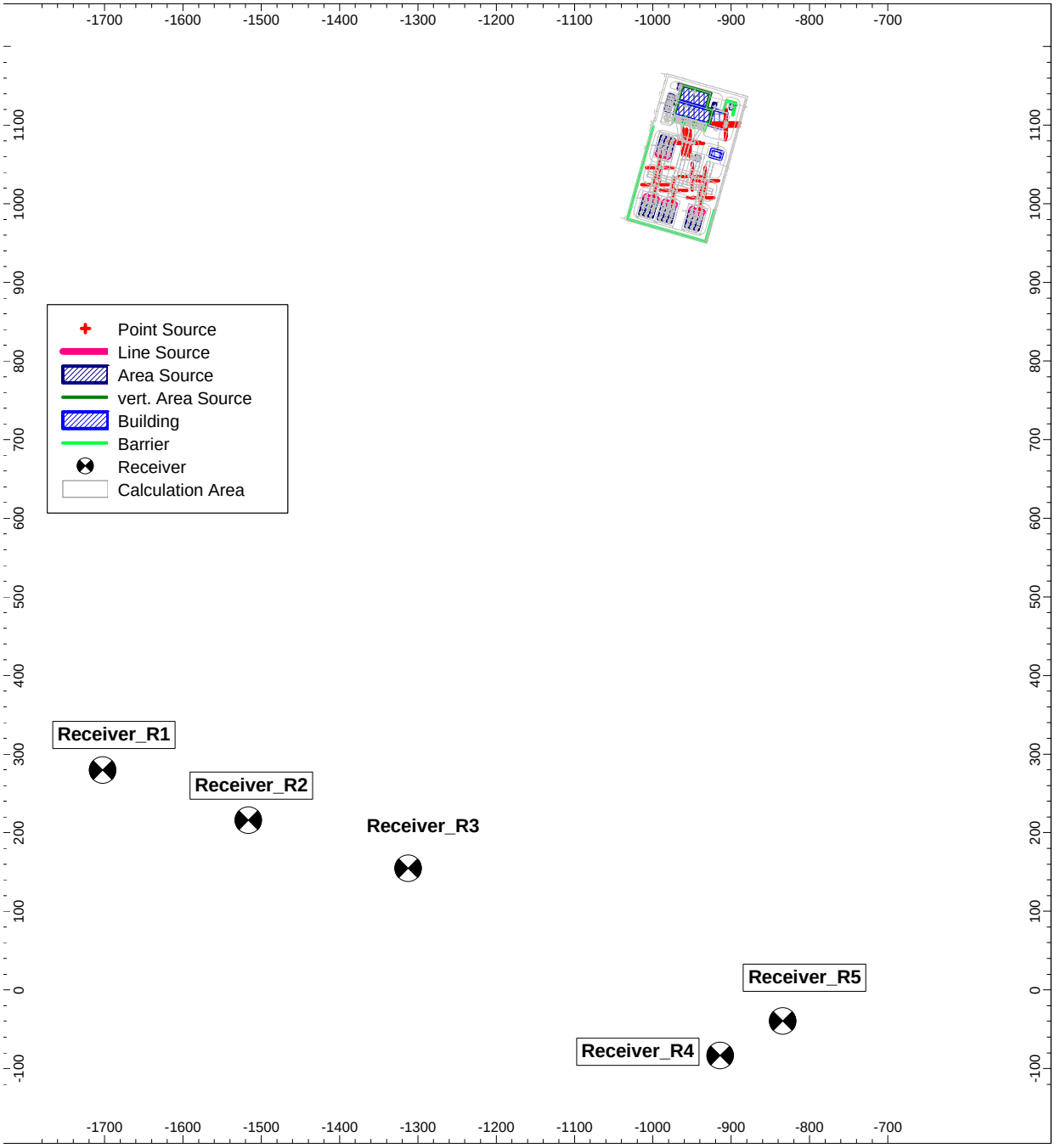


Fig. 4.1: Pittsburg, Standard Oil, layout with sound sources and receivers

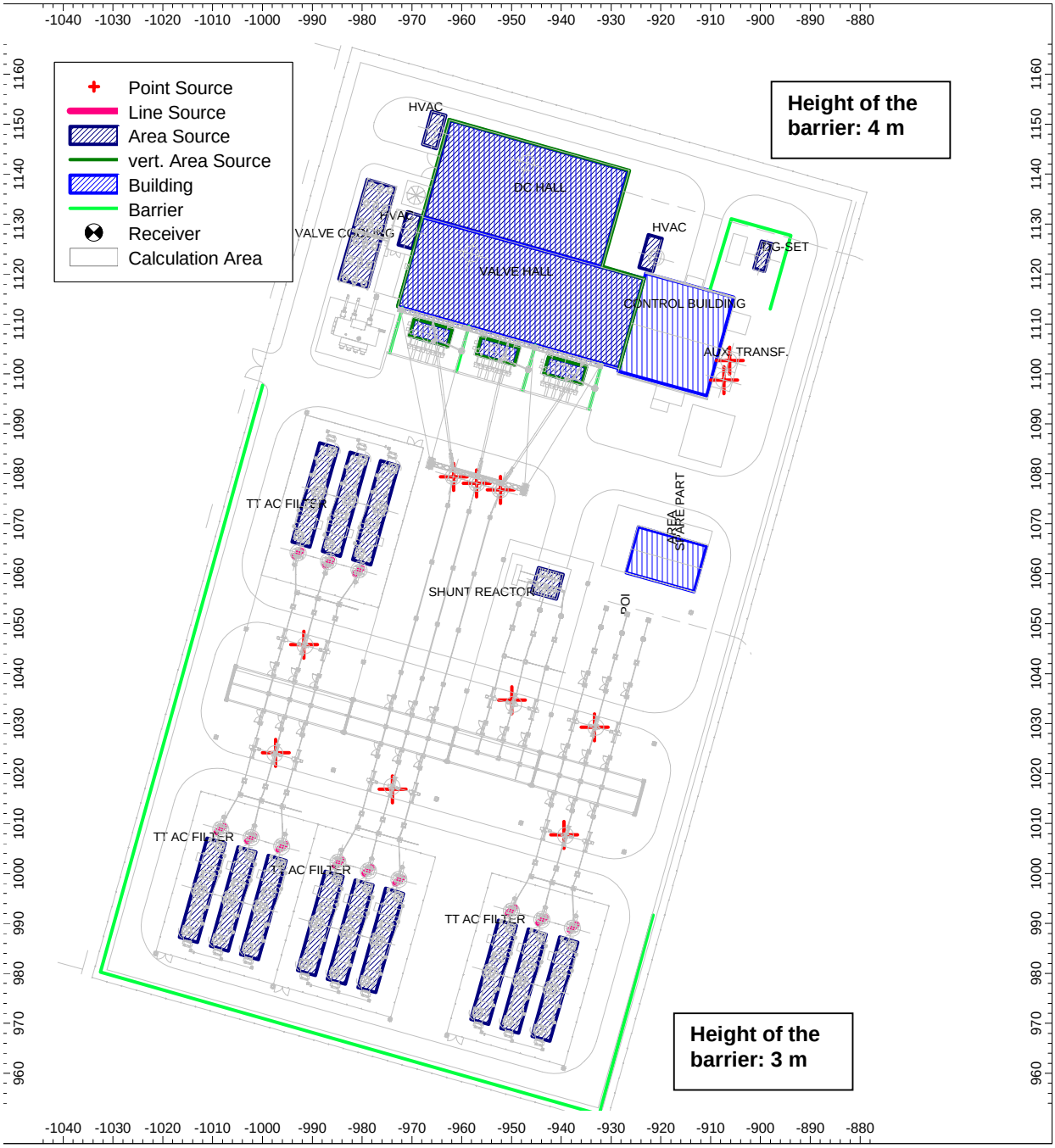


Fig. 4.2: Pittsburg, Standard Oil, layout with sound sources

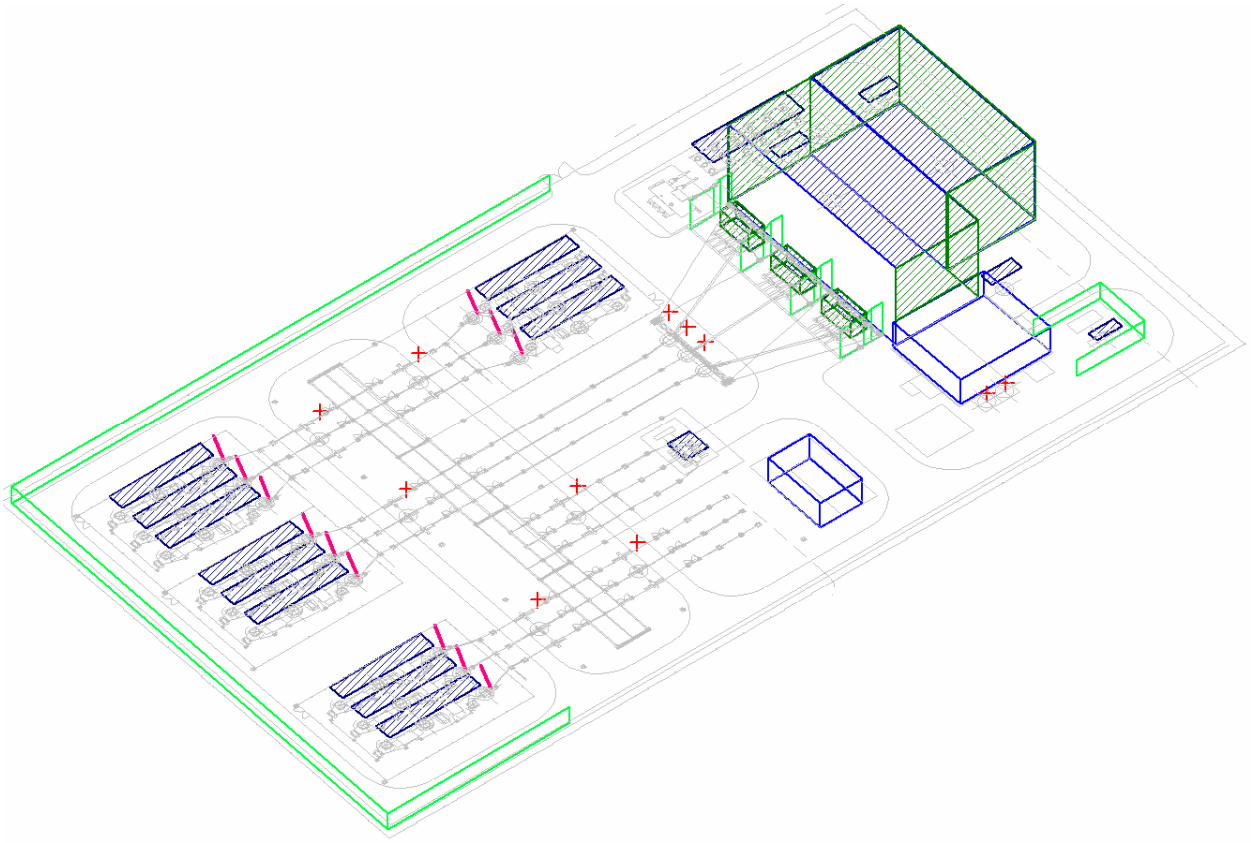


Fig. 4.3: Pittsburg, Standard Oil, 3D view

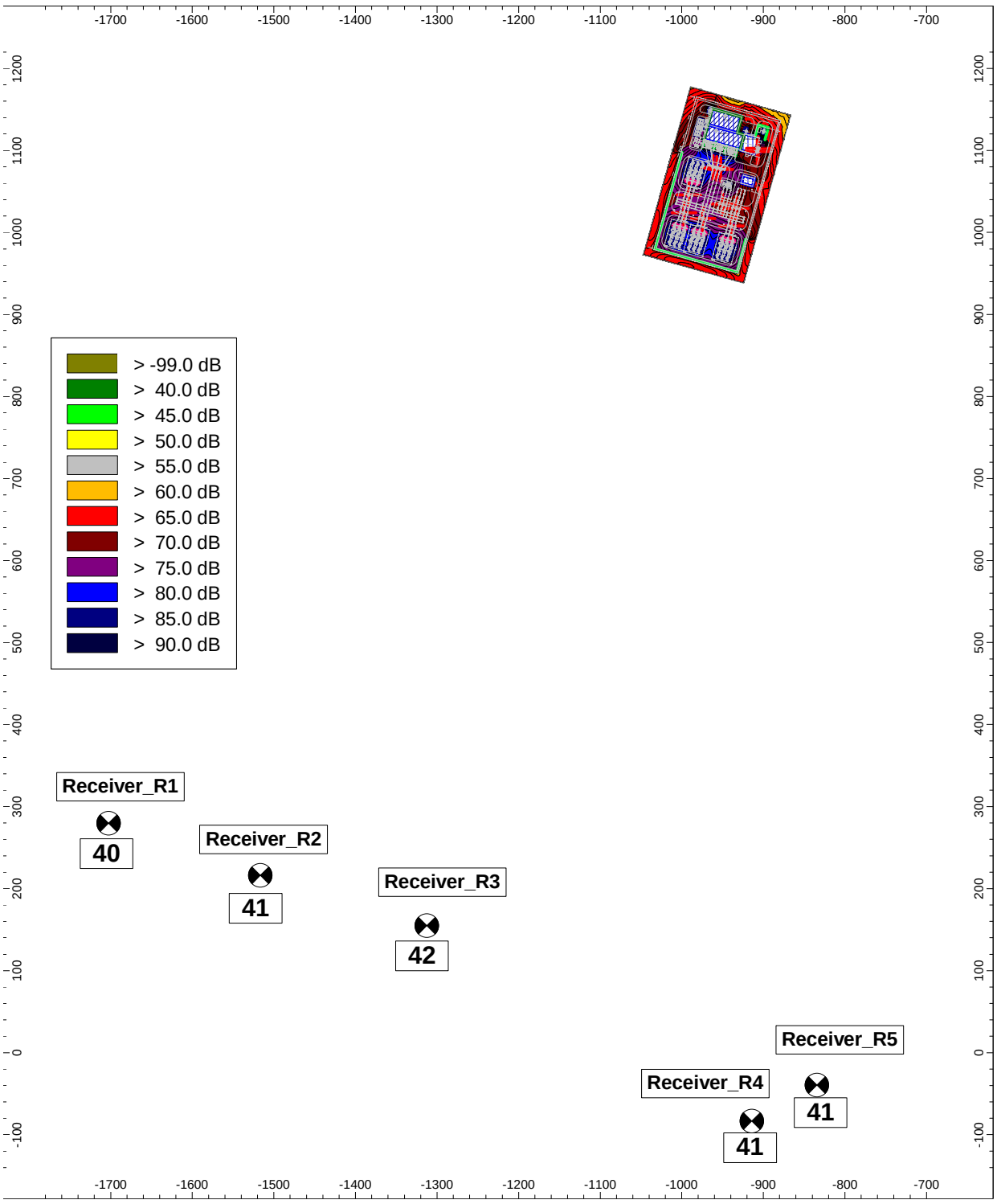


Fig. 4.4: Pittsburg, Standard Oil, noise contour map at height of 1,5 m

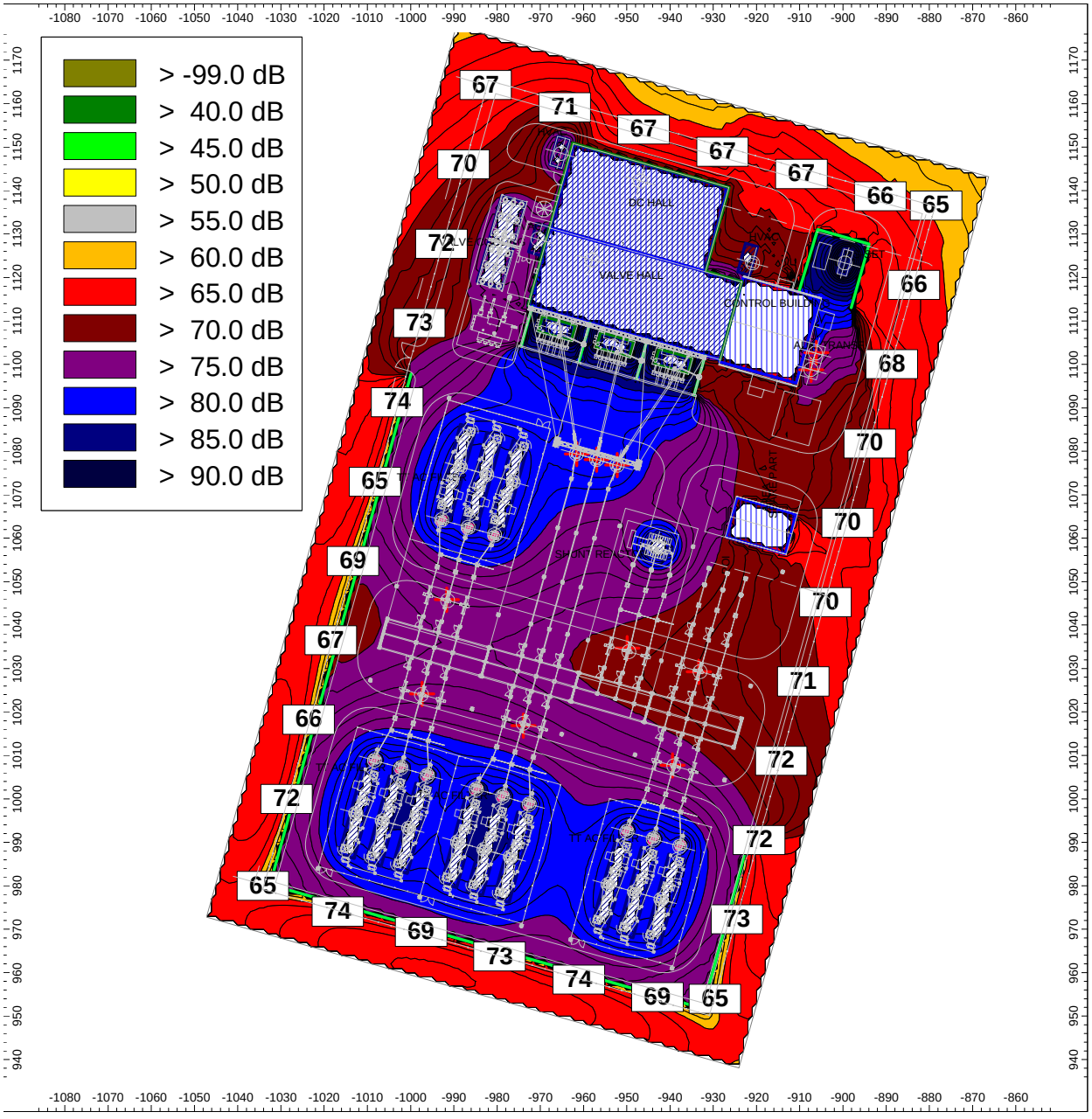


Fig. 4.5: Pittsburg, Standard Oil, noise contour map converter station only, at height of 1,5 m

APPENDIX I HAZARDOUS MATERIAL REGULATIONS

This appendix presents supplemental information on hazardous material related regulations that apply to the proposed Trans Bay Cable Project.

The following regulations apply to the storage, handling, and disposal of hazardous materials and waste for the Project. The Project will comply with all applicable regulations for hazardous materials and hazardous waste handling, storage, and disposal. Table 4.14-1 in Section 4.14 of the EIR summarizes the applicable regulations.

I.1 FEDERAL

I.1.1 Hazardous Materials

Hazardous substances are governed in part by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and the Superfund Amendments and Reauthorization Act (SARA) of 1986. Additional information on these laws and implementing regulations is provided below:

- SARA Title III, also known as the Emergency Planning and Community Right-to-Know Act (EPCRA), establishes reporting requirements for businesses and facilities that store, handle, or produce significant quantities of hazardous substances. EPCRA also requires states to establish a system to inform federal, state, and local authorities of any such substances stored or handled by the regulated community.
- Title 40 of the Code of Federal Regulations (CFR) Part 302 implements the CERCLA hazardous materials release requirements and identifies hazardous substances, reportable quantities (RQs), and notification requirements. The National Response Center (NRC) in Washington, D.C., must be notified of an accidental release of a hazardous substance in excess of an RQ. CERCLA-listed hazardous substances and RQs are listed in 40 CFR Part 302.4.
- 40 CFR Part 355 codifies the EPCRA planning requirements and establishes the list of Extremely Hazardous Substances (EHSs), threshold planning quantities (TPQs), and emergency response planning requirements.

Hazardous substances are also governed in part by the federal Clean Air Act (CAA).

40 CFR Part 68, Chemical Accident Prevention Provisions, identifies regulated substances, threshold quantities (TQs), and requirements for preventing accidental releases of these substances. A Risk Management Plan (RMP) is required for any processes involving regulated substances in excess of their respective TQ. An RMP must be in place when a regulated toxic substance is first introduced to the process, if the hazardous materials TQ are exceeded.

Clean Water Act (CWA) provisions also apply to hazardous substances. 40 CFR Part 112 identifies facilities that are required to prepare a Spill Prevention, Control, and Countermeasure (SPCC) Plan. Regulated facilities are those that store oil in aboveground oil tanks with a capacity greater than 660 gallons for individual tanks or 1,320 gallons for more

than one tank. Facilities with an underground oil storage capacity greater than 42,000 gallons also must comply with the SPCC requirements. The SPCC program is designed to prevent discharge of oil into navigable waters.

I.1.2 Hazardous Wastes

The handling, storage, and disposal of both hazardous and nonhazardous wastes are addressed through the Resource Conservation and Recovery Act (RCRA) (42 U.S. Code [USC] 6901 et seq.) and its implementing regulations (40 CFR Part 260 et seq.). As required by the RCRA, an application for a hazardous waste generator identification number would be coordinated through the U.S. Environmental Protection Agency (EPA) and the California Department of Toxic Substances Control (DTSC). Additional information on these laws and implementing regulations is provided below:

- 40 CFR Parts 260–272 govern the generation, transportation, treatment, storage and disposal of hazardous waste through a comprehensive management system. These regulations also list the characteristics of hazardous wastes, including ignitability, corrosivity, reactivity and toxicity. Subtitle D of these parts grants authority for regulating nonhazardous waste to the state.
- 49 CFR Parts 172, 173, and 179 provide standards for packaging hazardous wastes and for labels, placards and markings on hazardous waste shipments by truck.
- 42 USC 6922 sets standards for generators of hazardous waste regarding recordkeeping, labeling practices, informing hazardous waste transporters of general composition of wastes, use of a manifest system, and reporting requirements for the generators.

I.2 STATE AND REGIONAL

I.2.1 Hazardous Materials

- California's version of EPCRA is set forth in Chapter 6.95 of the California Health and Safety Code (H&SC), Article 1, the Hazardous Materials Release Response Plans and Inventory. Article 1 requires emergency response plans for facilities that store hazardous materials in excess of 55 gallons, 500 pounds, or 200 cubic feet. Facilities that handle more than these quantities of hazardous materials must submit a Hazardous Materials Business Plan (HMBP) to the Certified Uniform Program Agency (CUPA).
- The California Accidental Release Prevention (CalARP) Program requires facilities that handle regulated substances in quantities greater than the applicable TQ to prepare an RMP as described in Title 19 CCR Division 2, Chapter 4.5.
- The State Water Resources Control Board (SWRCB) administers the Aboveground Petroleum Storage Tank Program in accordance with H&SC Section 25270. Tanks must

be registered with the SWRCB. The Regional Water Quality Control Board (RWQCB) ensures compliance with the program through inspections of tanks and review of the facility's SPCC Plan.

- Title 8 of the CCR addresses the control of hazardous substances. Section 5189 of Title 8 sets forth the Process Safety Management (PSM) standard for processes involving a highly hazardous chemical in excess of certain quantities. PSM requires a process hazard analysis, current safety information, an employee participation program, written operating procedures, a mechanical integrity program, and other procedures.
- Section 5194 of Title 8 of the CCR, Hazard Communication, requires that employers evaluate the potential hazards of chemicals handled at their workplace and share this information with their employees.
- California Vehicle Code Section 32100.5 requires specific practices for the transportation of materials that may pose an inhalation hazard.

I.2.2 Hazardous Wastes

- The Hazardous Waste Control Act (HWCA) of 1972 is codified in H&SC Section 25100 et seq. Regulations addressing the management of hazardous wastes are found in 22 CCR 66001 et seq. These management issues include: characterizing wastes, obtaining a waste identification number, implementing a waste reduction program, manifesting wastes, packaging and labeling of wastes, recordkeeping, monitoring and emergency preparedness.
- 22 CCR 67100, Hazardous Waste Source Reduction and Management Review, requires waste generators, as specified by the quantities of hazardous waste generated, to develop a plan for reducing their hazardous wastes. Then, if applicable, generators must prepare a hazardous waste management performance report every four years.
- H&SC Section 25500 et seq. HMBPs require emergency response plans from facilities that store hazardous materials in excess of 55 gallons, 500 pounds, or 200 cubic feet, as appropriate. Hazardous wastes or mixtures of hazardous wastes are included in the definition of hazardous materials. Inventories prepared in accordance with this requirement would include information on hazardous wastes.
- 22 CCR 66260–66270 establish hazardous waste regulations for generators and transporters of hazardous wastes, and owners of hazardous waste Treatment, Storage, and Disposal Facilities (TSDFs).
- The Porter-Cologne Water Quality Control Act (Water Code, §§ 13000-14958) regulates wastes that have the potential to cause loss of a beneficial use of California's waters. This act requires the RWQCB to establish reportable quantities of hazardous wastes and hazardous materials based on their potential to degrade the waters of the state. Any

discharge of hazardous materials that is inconsistent with the discharge requirements of the facility must be reported to the appropriate authorities.

- Title 8 of the CCR contain the California Occupational Safety and Health Administration (Cal-OSHA) regulations for worker safety, including the storage and handling of hazardous materials. It also identifies protective equipment for workers who handle hazardous materials and requirements for general facility safety. In general, California regulations pertaining to industrial relations are more stringent in Title 8 of the CCR than those established by 29 CFR Part 1910 et seq.

I.2.3 Nonhazardous Waste

Nonhazardous wastes are governed in part by the California Integrated Waste Management Act (CIWMA) of 1989 (Public Resources Code [PRC] Section 40000 et seq.). This law serves as a guide for an integrated statewide system of solid waste management, which includes efforts for solid waste handling, disposal, source reduction, recycling, and land disposal safety. CIWMA requires each county to submit an integrated waste management plan to the state.

I.3 LOCAL

For solid nonhazardous wastes, the San Francisco Department of Public Health Environmental Health Section and the Contra Costa County Health Services Agency are responsible for administering and enforcing the CIWMA, for their respective counties. For hazardous wastes, local regulations consist primarily of the administration and enforcement of the Hazardous Waste Control Law (HWCL).

The San Francisco Department of Public Health Environmental Health Section and the Contra Costa County Health Services Agency are the CUPAs with responsibility for the following programs and plans pertaining to hazardous materials in their respective jurisdictions:

- Hazardous Materials Business Plan
- CalARP RMP
- USTs
- Hazardous waste
- SPCC Plan

The San Francisco Hazardous Materials/Unified Program Agency and the Hazardous Waste Program of the Department of Health Services, the Fire Department, and the Sheriff's Department are the local agencies that would regulate the hazardous waste associated with

the San Francisco Converter Station portion of the Project. For emergency spills, the San Francisco Hazardous Materials team is responsible for containment and cleanup, and the Sheriff's Department would provide onsite command. Because the San Francisco Converter Station would involve excavation of more than 50 cubic yards of soil Bayward of the historic shoreline of San Francisco Bay, the Project would be under the jurisdiction of Article 22 of the City and County of San Francisco's Public Health Code, commonly referred to as the Maher Ordinance. The Maher Ordinance requires soil analysis for a specified list of inorganic and organic chemicals at construction sites where: 1) at least 50 cubic yards of soil are disturbed; 2) there is construction on the Bay side of the historic high-tide line; or 3) there is reason to believe that hazardous waste may be present.

The Contra Costa County Health Services Agency and the Contra Costa County Hazardous Materials Program of the Health Services Agency, the Contra Costa County Fire Protection District, the Fire Department, and the Sheriff's Department are the local agencies that would regulate the hazardous waste associated with the Pittsburg Converter Station portion of the Project. For emergency spills, the Contra Costa County Hazardous Materials Incident Response Team is responsible for containment and cleanup, and the Sheriff's Department would provide onsite oversight.

Local agency requirements and regulations associated with the proposed Project would need to be addressed before the construction and operation of the facilities, and the facilities would be required to conform with all local requirements.

The design, construction, operation, and maintenance of all hazardous materials storage and delivery systems for the Project would be in accordance with applicable codes and regulations. Some of these codes and their applicability to the proposed Project are listed below:

- State Building Standard Code, which incorporates the Uniform Building Code, Uniform Fire Code, Uniform Mechanical Code and the Uniform Plumbing Code
- Uniform Fire Code, Article 80, Hazardous Materials Section
- National Fire Protection Association, Section 110 for emergency diesel generators and Section 20 for diesel powered fire protection pumps.
- California Vehicle Code, which includes licensing requirements for hazardous materials haulers

APPENDIX J PALEONTOLOGICAL RESOURCES TECHNICAL REPORT

This appendix presents the Paleontological Resources Technical Report prepared for the Trans Bay Cable Project.

PALEONTOLOGICAL RESOURCES TECHNICAL REPORT

TRANS BAY CABLE PROJECT
SAN FRANCISCO BAY REGION, CALIFORNIA

Under Contract To:
URS Corporation, Inc.
130 Robin Hill Rd., Suite 100
Santa Barbara, CA 93117
(URS Project No. 28906581)

Prepared By:
David Lawler - Paleontologist
Lawler Associates Geoscience
483 Kentucky Ave
Berkeley, California, 94707

November 2005

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1.0 PALEONTOLOGICAL RESOURCES ASSESSMENT SUMMARY

A paleontological resources sensitivity analysis of the Trans Bay Cable Project (TBC) has been performed using available published scientific literature and unpublished archival records and data. This has included areas of potential disturbance within the project footprint. Paleontological Assessment Ratings (Low, Medium, and High) have been assigned to the project based on identified resources within undifferentiated Quaternary units of Pleistocene geologic age. Fossil vertebrate resources are considered rare in respect to the identified geological formations and geologic periods.

From a regional perspective, occurrences of paleontological resources may likely be discovered in the Quaternary Alluvium (*Qal*) sedimentary unit within the project area.

Background research and prior paleontological project reports provided the scientific data for determining the potential locations of paleontological resources within the project area.

2.0 INTRODUCTION

Mr. David Lawler, professional paleontologist, has undertaken a paleontological resources sensitivity analysis of the TBC project area that is based on (1) museum repository data and paleontological collection material, and (2) a published and unpublished scientific literature survey to provide relevant environmental overview data.

The compiled data have been vital in assessing paleontological resource sensitivity issues in relation to proposed project construction activities. The assessment is based both on known paleontological sites within the project area, as well as extrapolated biostratigraphic information derived from rock units in adjacent areas or areas of regional context. Data sources include published and unpublished technical reports, to other relevant types of technical information housed in designated museum repositories.

3.0 METHODS

A standard “Class I” technical literature and records review was conducted to assess the paleontological resource potential at the TBC project site. Some relevant data from outside of the project footprint area have been included in this report for contextual purposes.

Geologic units (mappable rock formations) occurring within the project area and their respective interpreted paleontological sensitivity are shown on Maps 1 and 2.

Published geologic maps served as the primary geologic data for the project. The most comprehensive geological references useful in paleontological resource sensitivity was that of Weaver (1949), covering Late Cenozoic deposits of the San Francisco Bay Region.

Specific technical paleontological and detailed lithologic data were derived from local geoscientist informants at California colleges and universities, and the designated northern California museum repository at the University of California, Berkeley Museum of Paleontology (UCMP).

Paleontological assessment of the project area was undertaken on the basis of information provided by existing geologic maps, paleontological and geological literature, and museum records.

Paleontological resources are lithologically dependent; that is, deposition and preservation of paleontological resources is tied to the lithologic unit in which they occur. The potential for paleontological resources to be present is described as the paleontological sensitivity of a particular geological unit.

The subject paleontological assessment consists of an evaluation of the paleontological potential of the proposed project components within the project area. The actual area of potential effects was considered to be within the footprint of any proposed excavation activities.

4.0 PROJECT AREA DESCRIPTION

The TBC project area is located in the San Francisco Bay region and extends from south San Francisco to Pittsburg (see Figure A.1-1 in the EIR). The topography surrounding San Francisco Bay and Suisun Bay consist of low rolling hills and ridges that flank it to the west and southwest (San Francisco Peninsula), northwest (Marin headlands), north (Sonoma Mountains), and east (Berkeley Hills). Suisun Bay is also flanked by low rolling hills and ridges to the north (Montezuma Hills) and south (Antioch and Concord Hills), respectively.

For description purposes, the project area can be divided into a series of cable routes and electrical converter stations. The principal offshore DC Cable route extends from San Francisco to Pittsburg. The proposed HWC Converter Station and associated onshore AC cable route and laydown area are located in San Francisco. The alternative Mirant Potrero Converter station and its associated onshore AC cable route and laydown area are also located in San Francisco slightly north of the HWC Converter station site. The alternative Sheedy Converter Station and its associated onshore AC cable route and laydown area are also located in San Francisco slightly south of the HWC Converter station site. The alternative Pier 96/94 Laydown Area is also located in the Potrero District (see Map A.2-1 in the EIR).

The existing PG&E substation and its proposed associated onshore DC and AC cable routes and laydown areas are located in Pittsburg. The Standard Oil Converter station and associated onshore AC cable route and laydown areas are also located in Pittsburg. The alternative Pittsburg 10th St. Converter station and its associated onshore AC cable route and laydown area are located in western Pittsburg slightly northwest of the Pittsburg Standard Oil Converter station site. The alternative Pittsburg Mirant Converter station and its associated onshore AC cable route and laydown area are located in northwest western Pittsburg. The Standard Oil Access Road is located near Loveridge Road. The Standard Oil Laydown Area is located near the Delta Energy Center (see Map A.2-1 in the EIR).

The proposed offshore submarine cable would be installed using a Hydroplow device, which would typically install the cable at a depth of 3 to 6 feet and would not be expected to penetrate into any paleontologically sensitive Quarternary Alluvium deposits.

Mapped geologic units and their respective paleontological sensitivity within the San Francisco and Pittsburg portions of the project area are shown on Maps 1 and 2 in this report. The project area includes sedimentary deposits of the Quaternary Alluvium.

5.0 GEOLOGIC SETTING

5.1 Regional Geology - Summary

Surficial sedimentary units of predominantly Pleistocene and Holocene to Recent age underlie the entire project area. These sediments include deposition that range from continental, alluvial, fluvial, estuarine, terrace, and fan-derived sediments to subaerial floodplain to marine terrace and near-shore deposits. Lithologies include sand, gravel, silt and clay; all of which are potentially favorable to the preservation of paleontological resources.

Rock outcrops of Miocene to Pleistocene age that occur as surficial and subsurface deposits along the northeast Contra Costa County - Delta area. These deformed and faulted sequences of sedimentary units that have been described and mapped previously by Atwater (1982), Brabb et. al. (1971), Graymer and Helley (1997), Sims et. al. (1973), Weaver (1949), and Wagner and Jennings (1981). It should be noted that Graymer and Helley (1997) have described the geomorphic development of the successive series of Pleistocene marine terraces that have been subsequently dissected by the major west flowing Sacramento river drainage.

Gradual, long-term erosion and previous construction activity have removed parts of the Recent age soil cover so that these Quaternary rock units and their contained fossils are now at or near the surface throughout most of the project area. These formations or parts of the formations now exist at or near the surface with varying width across the project area terrain,

but are obscured in most areas by water bodies, marsh areas, soil, vegetation, or thin deposits of surficial sediment. Thus, visual detection of fossils is possible in those areas where natural erosion or man-made excavations during road, pipeline, or building site excavation or grading operations have removed this cover.

The majority of the converter stations and laydown areas may be overlain by imported fill material. Given this fact, the potential paleontological sensitivity of a particular site within the project has been determined from the distribution of known nearby fossil localities, and available mapping of the Quaternary alluvium (*Qal*), Quaternary undifferentiated (*Qu*) outcrops and Recent age artificial fill (*Qaf*).

The Quaternary rock units vary in facies type from conglomerates to sandstones to unconsolidated siltstone and clays, all of which are either fossiliferous or potentially fossiliferous.

6.0 PALEONTOLOGY - PROJECT SETTING

6.1 Significance of Paleontological Resources

The San Francisco Bay region contains a diverse record of geologic and biologic history, which spans more than 100 million years, dating from the Upper Cretaceous period. Under the combined influences of regional tectonic events ranging from creation of the Sacramento Basin to uplift of the Coast Range foothill region, deposition of sedimentary sequences and fluctuating worldwide sea level changes; fossils of marine and terrestrial organisms have accumulated to produce a significant record of prehistoric life.

Much of the paleontological interest within the project area vicinity stems from the well known discoveries of Pleistocene age fossil vertebrate faunas derived from Quaternary age units in other parts of the San Francisco Bay Region. Identification and scientific description of both of these diverse fossil vertebrate assemblages provides one of the best known records of Pleistocene faunas in California (see Stirton, 1939, 1951; Savage, 1951; Wolf, 1971; and Jefferson, 1991). Preservation of riparian and other continental volcanoclastic deposits provided favorable conditions for preserving vertebrate fossil remains in these geologic units.

Paleontological resources are classified as a non-renewable scientific-cultural resource and are protected most notably by the 1906 Federal Antiquities Act and other subsequent federal legislation and policies and California Environmental Quality Act (CEQA) environmental provisions. Significant paleontological resources are defined in this report to include the interpretation outlined by the Society of Vertebrate Paleontology (1994), wherein are vertebrate fossils are considered significant.

Paleontological Significance can be summarized according to the following criteria:

- Provides important information on evolutionary trends; relating living organisms to extinct organisms
- Provides important information pertaining to biological community development and zoological/botanical biota interaction
- Demonstration of unusual circumstances in biotic history
- Existence of limited sample size, in danger of depletion or destruction by natural processes, vandalism or commercial exploitation, found in no other geographic locations

6.2 Criteria for Determination of Potential

Three categories of paleontological potential are used in this report. Rating categories are considered to be interpretive and are subject to change as new information is obtained. High Potential, Moderate Potential, and Low Potential ratings are defined as follows:

6.2.1 High Potential Rating

Rock units with a High potential for significant paleontological resources are known to have yielded vertebrate fossils within the project area or region. This does not necessarily imply that vertebrate fossils will always be recovered from High potential rated rock units, but only that there are recorded occurrences within the unit. Additional factors that are considered pertain to inferred depositional environment and lithology.

6.2.2 Moderate Potential Rating

Rock units possessing some degree of potential, such as favorable depositional environment for resource preservation or lithologically similar rock units in the region have yielded vertebrate fossils. All Moderate potential rated rock units are recommended for field survey and construction monitoring.

6.2.3 Low Potential Rating

Rock units containing lithologies that do not commonly preserve significant fossil resources (i.e., coarse conglomerates, welded or ignimbrite volcanic ash deposits). Igneous plutonic rocks, such as the granite or gabbro are precluded from preservation of paleontological resources, due to their genesis within a magmatic environment. In addition, sediments of subHolocene or Recent age are usually considered too young in geologic time to preserve fossils.

7.0 PALEONTOLOGICAL RESOURCES

7.1 Cenozoic Rock Units

Over 100 years of fossil vertebrate collecting in the San Francisco - Bay Delta Region has produced one of the most extensive databases for understanding the fossil vertebrate record northern California.

The first record of a fossil vertebrate from San Francisco - Bay Delta Region was a fossil mammoth tooth from the San Pablo Bay area, as reported by Blake (1855). Stirton (1939 and 1951), Savage (1951), and Jefferson (1991) have extensively reported on fossil land-mammal assemblages found in this region (see Table 3). Vertebrate sites in the Hercules-Rodeo districts have yielded a significant quantity of microvertebrate material. This diverse microvertebrate fauna has been extensively studied most recently by Wolf (1971, 1973, and 1975) and consists of numerous small mammals including lagomorphs (rabbits), rodents, and insectivores (shrews and moles), and a variety of birds and herpetofauna (frogs, lizards and snakes). Many of the fossil specimens represent the best-preserved specimens of particular taxa found to date. Appendix A contains data from fossil mammal assemblages collected from the San Francisco Bay-Delta Region (see UCMP 1359,1363 V3719, and V79073 site records).

Sandstone, silt, and clay lithologies of both geologic units are favorable for exceptional preservation of vertebrate, and microvertebrate fossil resources.

7.2 QUATERNARY AGE SEDIMENTS (*QAL*)

Quaternary alluvium deposits of Pleistocene age occur locally within the active stream portions of the project area. Usage of the *Qal* geologic symbol designation on available geologic maps is highly variable. Geologic units ranging from Quaternary age stream, terrace, fluvial, and alluvial fan and floodplain deposits have been lumped under this designation, particularly where geologic data have been scarce (see Helley and Harwood, 1985; and Wagner et. al., 1981). Helley and Harwood (1985) have designated Quaternary age sediments within the project region as the Quaternary alluvial (*Qa*) or basinal (*Qb*) units.

Sandstone, silt, and clay lithologies of both geologic units are favorable for exceptional preservation of vertebrate, and microvertebrate fossil resources. Several Pittsburg vertebrate sites outside the project area have been assigned to the Pleistocene age Quaternary Alluvium unit (*Qal*) by museum scientists and are not further differentiated geologically.

No vertebrate paleontological sites are known to exist with in the project area. However, Paleontological sites do occur in similar age rock units outside the project area but within the San Francisco-Bay Sacramento region. These contain scientifically important vertebrate

fossils of proboscidian (elephant), camel, sloth, bison (buffalo), and rodent terrestrial mammalian taxa (see confidential fossil locality data - Appendix A).

7.3 HOLOCENE AND POST-HOLOCENE AGE SEDIMENTS

Sediments of probable Holocene or post-Holocene age that form the thin, surficial cover are considered of limited paleontological interest and thus considered inconsequential.

8.0 PALEONTOLOGICAL SENSITIVITY ANALYSIS

The paleontological sensitivity ratings are summarized for all proposed project components on Table 2. The Quaternary Alluvium unit (*Qal*) is a geological unit of paleontological significance and has been assigned a High rating. Analysis of museum record and specimen collections and the distribution of regional fossil localities permitted classification of paleontological resource sensitive rock units. It should be noted that the sensitivity rating category for a particular geological unit may change as future paleontological resources are discovered.

8.1 Proposed Project Routes and Converter Stations

8.1.1 San Francisco - HWC Converter Station/Onshore AC/DC Cable Route/ Laydown Area (W. Pacific)

The proposed San Francisco - HWC Converter station and its associated onshore AC cable route are assigned a high sensitivity rating, since shallow excavations are expected to penetrate into undisturbed Quaternary alluvium (*Qal*) sediments (see Map 1).

8.1.2 Standard Oil Converter Station/Onshore AC/DC Cable Route/ Laydown Areas/Access Road

The proposed Pittsburg – Standard Oil Converter station and its associated onshore AC cable route are assigned a high sensitivity rating, since shallow excavations are expected to penetrate into undisturbed Quaternary alluvium (*Qal*) sediments (see Map 2).

8.1.3 Offshore DC Cable Route (SF to Pittsburg)

The proposed offshore DC Cable route Low Flow Channel are assigned a low sensitivity rating, since shallow excavations are not expected to penetrate into undisturbed Quaternary alluvium (*Qal*) sediments.

8.2 Alternative Project Routes and Converter Stations

8.2.1 Mirant Potrero Converter Station (2 layouts)

The proposed alternative Mirant Potrero Converter station and its associated onshore AC cable route are assigned a high sensitivity rating, since shallow excavations are expected to penetrate into undisturbed Quaternary alluvium (*Qal*) sediments (see Map 1).

8.2.2 Sheedy Converter Station/Offshore DC Cable Route

The proposed alternative Sheedy Converter station and its associated onshore AC cable route are assigned a high sensitivity rating, since shallow excavations are expected to penetrate into undisturbed Quaternary alluvium (*Qal*) sediments (see Map 1).

8.2.3 Alternative SF Laydown Area (Pier 94/96)

The proposed alternative Pier 94/96 Laydown area is assigned a low sensitivity rating, since shallow excavations or grading activities are not expected to penetrate into undisturbed Quaternary alluvium (*Qal*) sediments.

8.2.4 Pittsburg 10th Street Converter Station 2 layouts E/W and N/S plus overall group of parcels/Offshore-Onshore DC/AC Cable Routes/Laydown Area (Mirant)

The proposed alternative Pittsburg – 10th Street Converter station and its associated onshore AC cable route are assigned a high sensitivity rating, since shallow excavations are expected to penetrate into undisturbed Quaternary alluvium (*Qal*) sediments (see Map 2). The laydown areas are assigned a low sensitivity rating, as use of these areas is not expected to penetrate into undisturbed Quaternary alluvium (*Qal*) sediments

8.2.5 Mirant Pittsburg Converter Station/Offshore-Onshore DC/AC Cable Routes/ Laydown Areas (Mirant)

The proposed alternative Pittsburg –Mirant Converter station and its associated onshore AC cable route are assigned a high sensitivity rating, since shallow excavations are expected to penetrate into undisturbed Quaternary alluvium (*Qal*) sediments (see Map 2). The laydown areas are assigned a low sensitivity rating, as use of these areas is not expected to penetrate into undisturbed Quaternary alluvium (*Qal*) sediments.

8.2.6 Alternative Standard Oil Access Road (to Loveridge Road)

The proposed alternative Standard Oil Access Road area is assigned a low sensitivity rating, since shallow excavations or grading activities are not expected to penetrate into undisturbed Quaternary alluvium (*Qal*) sediments.

8.2.7 Alternative Standard Oil Laydown Area (Delta Energy Center)

The proposed alternative Standard Oil Laydown Area is assigned a low sensitivity rating, since shallow excavations or grading activities are not expected to penetrate into undisturbed Quaternary alluvium (*Qal*) sediments.

9.0 MITIGATION RECOMMENDATIONS

9.1 General Measures

1. Pre-construction meetings with key construction personnel to provide brief discussions pertaining to paleontological resource significance, visual identification, and discovery notification procedures.
2. Proposed construction areas containing geological units designated with a potentially Moderate or High sensitivity rating, should be monitored by a professional paleontologist during construction, to insure that subsurface paleontological resources are adequately protected.
3. If unique paleontological resources are discovered, then collect all significant fossil material, prepare, identify, and curate then into state-designated scientific repository. Salvage operations should be conducted in accordance with professional paleontological standards (e.g., Society of Vertebrate Paleontology standards).

9.2 Potential Paleontological Resource Impacts and Specific Mitigation Measures

The CEQA threshold for a significant impact to a paleontological resource is reached when the project will directly or indirectly destroy a unique paleontological resource, site, or unique geological feature.

9.3 PROPOSED PROJECT ROUTES AND CONVERTER STATIONS

9.3.1 HWC Converter Station/Onshore AC/DC Cable Route/Laydown Area (W. Pacific)

No fossil localities have been identified within the footprint of this project component. Excavations for this site have the potential to penetrate into undisturbed Quaternary alluvium (*Qal*). It is recommended that a paleontologist intermittently spot-check excavation spoils for

significant paleontological materials during site grading and excavation activity, below the surficial artificial fill zone.

9.3.2 Standard Oil Converter Station/Onshore AC/DC Cable Routes/ Laydown Area/Access Road

No fossil localities have been identified within the footprint of this project component. Excavations for this site have the potential to penetrate into undisturbed Quaternary alluvium (*Qal*). It is recommended that a paleontologist intermittently spot-check excavation spoils for significant paleontological materials during site grading and excavation activity.

9.3.3 Offshore DC Cable Route (SF to Pittsburg)

It is not necessary for a paleontologist to undertake mitigation or monitoring, since shallow excavations are not expected to penetrate into undisturbed Quaternary alluvium (*Qal*) sediments.

9.4 Alternative Project Routes and Converter Stations

9.4.1 Mirant Potrero Converter Station (2 layouts)

No fossil localities have been identified within the footprint of this project component. Excavations for this site have the potential to penetrate into undisturbed Quaternary alluvium (*Qal*). It is recommended that a paleontologist intermittently spot-check excavation spoils for significant paleontological materials during site grading and excavation activity, below the surficial artificial fill zone.

9.4.2 Sheedy Converter Station/Offshore DC Cable Route

No fossil localities have been identified within the footprint of this project component. Excavations for this site have the potential to penetrate into undisturbed Quaternary alluvium (*Qal*). It is recommended that a paleontologist intermittently spot-check excavation spoils for significant paleontological materials during site grading and excavation activity, below the surficial artificial fill zone.

9.4.3 Alternative SF Laydown Area (Pier 94/96)

No fossil localities have been identified within the footprint of this project component. Excavations for this site will only involve superficial grading of existing artificial fill materials (*Qaf*) and are not expected to penetrate into undisturbed Quaternary alluvium (*Qal*) or impact paleontological resources.

9.4.4 Pittsburg 10th Street Converter Station/(2 layouts E/W and N/S plus overall group of parcels)/Offshore-Onshore DC/AC Cable Routes/Laydown Areas (Mirant)

No fossil localities have been identified within the footprint of this project component. Excavations for this site have the potential to penetrate into undisturbed Quaternary alluvium (*Qal*). It is recommended that a paleontologist intermittently spot-check excavation spoils for significant paleontological materials during site grading and excavation activity, below the surficial artificial fill zone. Use of the laydown area will not affect underlying strata or impact paleontological resources.

9.4.5 Mirant Pittburg Converter Station/Offshore-Onshore DC/AC Cable Routes/ Laydown Area (Mirant)

No fossil localities have been identified within the footprint of this project component. Excavations for this site have the potential to penetrate into undisturbed Quaternary alluvium (*Qal*). It is recommended that a paleontologist intermittently spot-check excavation spoils for significant paleontological materials during site grading and excavation activity, below the surficial artificial fill zone. Use of the laydown area is not expected to impact underlying strata nor paleontological resources.

9.4.6 Alternative Standard Oil Access Road (to Loveridge Road)

No fossil localities have been identified within the footprint of this project component. Excavations for this site are expected to involve only superficial grading of existing artificial fill materials (*Qaf*) and are not expected to penetrate into undisturbed Quaternary alluvium (*Qal*).

9.4.7 Alternative Standard Oil Laydown Area (Delta Energy Center)

No fossil localities have been identified within the footprint of this project component. Excavations for this site are expected to involve only superficial grading of existing artificial fill materials (*Qaf*) and are not expected to penetrate into undisturbed Quaternary alluvium (*Qal*).

10.0 DATA SOURCES

Paleontological resource data within the project area were compiled from published records of previous geologic and paleontological investigations. These references are included in the attached bibliography. Also included are unpublished geologic maps, unpublished paleontological research papers and museum records.

Sources consulted on the general geology of the area included regional geologic maps compiled by the California Division of Mines and Geology. More specific geologic information in the form of 1:24,000 and 1:62,500 scale USGS and CDMG geologic maps available for the project area.

Fossil locality and records data were derived from the following institutional sources:

1. University of California, Berkeley, Museum of Paleontology (UCMP). Review of vertebrate paleontological records and collections data.
2. California Academy of Sciences (CAS). Review of vertebrate paleontological records and collections data.

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TABLE 1
TRANS BAY CABLE PROJECT
GEOLOGIC UNITS WITHIN PROJECT AREA

Symbol	Rock Unit	Age	Rating
(*Qal*) *	Quaternary Alluvium	Pleistocene	(High) (Known vertebrate fauna)
(*Qaf*)	Artificial Fill	Recent	(None)

* (*Qal*) Quaternary Alluvium - notation

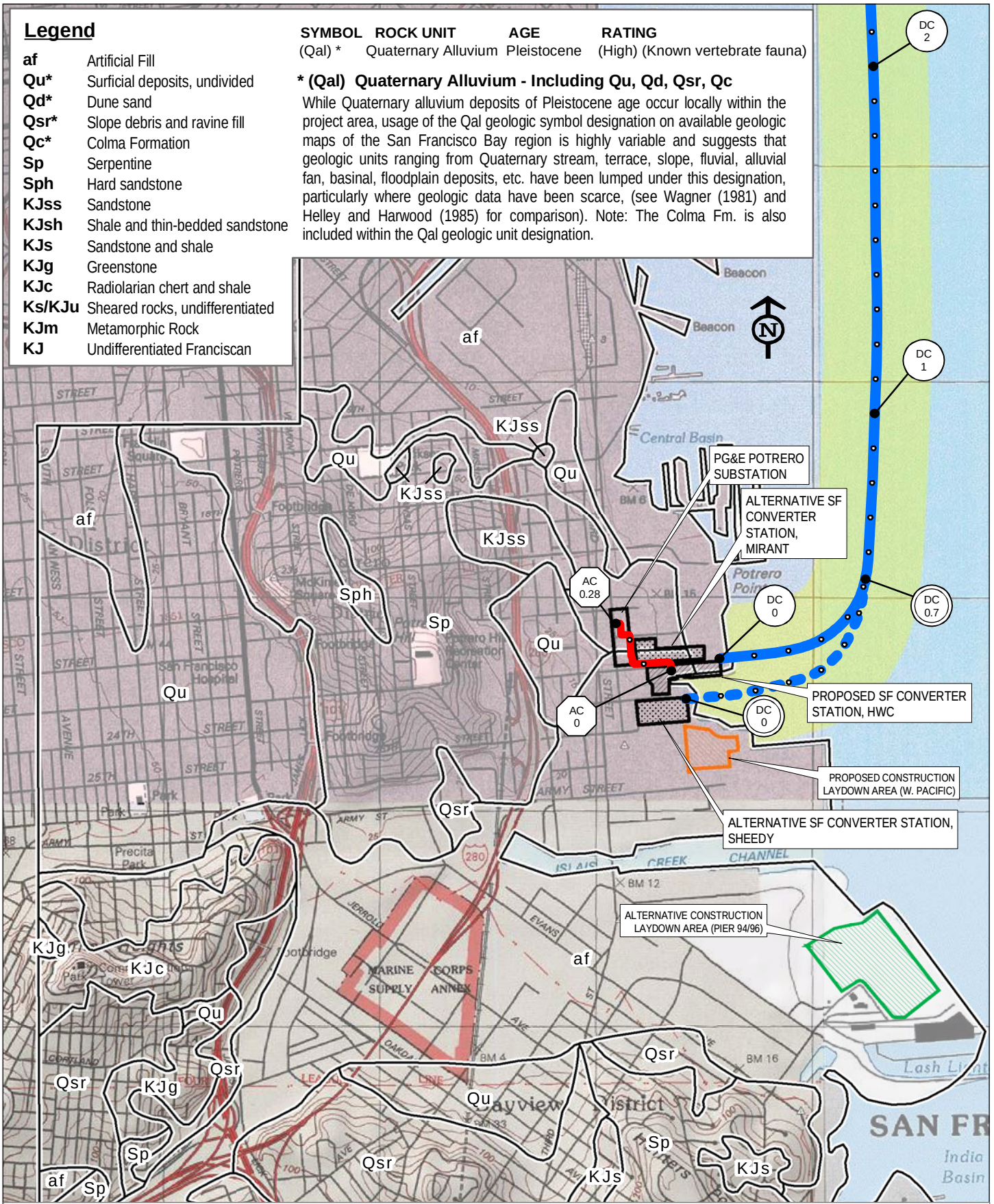
While Quaternary alluvium deposits of Pleistocene age occur locally within the project area, usage of the *Qal* geologic symbol designation on available geologic maps of the San Francisco Bay region is highly variable and suggests that geologic units ranging from Quaternary stream, terrace, slope, fluvial, alluvial fan, basinal, floodplain deposits, etc. have been lumped under this designation, particularly where geologic data have been scarce, (see Wagner (1981) and Helley and Harwood (1985) for comparison). Note: The Colma Fm. is also included within the *Qal* geologic unit designation.

TABLE 2
TRANS BAY CABLE PROJECT
PALEONTOLOGICAL SENSITIVITY AND GEOLOGIC UNITS

Rock Formation	Sensitivity Rating
Proposed Project Components	
Offshore DC Cable Route	
Qal (Quaternary Alluvium)	(Low-No Disturbance)
SF – HWC Converter Station and AC Cable Route	
Qal (Quaternary Alluvium)	High
Qaf (Artificial Fill)	None
Pittsburg – Standard Oil Converter Station and AC Cable	
Qal (Quaternary Alluvium)	High
Qaf (Artificial Fill)	None
Alternative Project Components	
SF – Mirant Converter Station and AC Cable Route	
Qal (Quaternary Alluvium)	High
Qaf (Artificial Fill)	None
SF – Sheedy Converter Station and AC Cable Route	
Qal (Quaternary Alluvium)	High
Qaf (Artificial Fill)	None
SF – Laydown Area (Pier 94/96)	
Qaf (Artificial Fill)	None
Pittsburg – 10th Street Converter Station Offshore-Shore DC/AC Cable Routes/Laydown Areas (Mirant)	
Qal (Quaternary Alluvium)	High
Qaf (Artificial Fill)	None
Pittsburg – Mirant Converter Station/Offshore-Shore DC/AC Cable Routes/Laydown Areas (Mirant)	
Qal (Quaternary Alluvium)	High
Qaf (Artificial Fill)	None
Pittsburg – Standard Oil Access Road (To Loveridge Road)	
Qaf (Artificial Fill)	None
Pittsburg – Standard Oil Laydown Area (Delta Energy Center)	
Qaf (Artificial Fill)	None

TABLE 3
PLEISTOCENE - RANCHOLABREAN LAND MAMMAL AGE VERTEBRATE TAXA LIST (PARTIAL) - SF BAY REGION (STIRTON, 1951)

Family	Genus	Scientific Name	Common Name
Rodentia	Spermophilidae	*Citellus*	Ground Squirrel
Rodentia	Cricetidae	*Perognathus*	Pocket Mouse
Rodentia	Cricetidae	*Peromyscus*	Pocket Mouse
Rodentia	Cricetidae	*Neotoma*	Wood Rat
Rodentia	Microtidae	*Microtus*	Meadow Vole
Rodentia	Geomyidae	*Thomomys*	Pocket Gopher
Carnivora	Canidae	*Canis dirus*	Dire Wolf
Carnivora	Canidae	*Canis irvingtonensis*	Coyote
Carnivora	Felidae	*Smilodon*	Sabre-Tooth Cat
Proboscidia	Mammutidae	*Mammuthus columbi*	Mammoth
Edentata	Nothrotherium		Ground Sloth
	Megalonyx		Ground Sloth
	Paramylodon		Ground Sloth
Perisodactyla	Tayassuidae		Peccary
Perisodactyla	Tapiridae	*Taipirus cf. haysii*	Tapir
Perisodactyla	Equidae	*Equus sp.*	Horse
Artiodactyla	Camelidae	*Camelops herternus*	Camel
Artiodactyla	Cervidae	*Tetrameryx irvingtonensis*	Deer
Artiodactyla	Cervidae	*Odocoileus*	Deer
Artiodactyla	Antilocapridae	*Antilocapra (?)*	Antelope
Artiodactyla	Antilocapridae	*Breameryx cf. minor*	Antelope
Artiodactyla	Bovidae	*Euceratherium*	Musk-Ox
Artiodactyla	Bovidae	*Bison latifrons*	Giant Bison
Artiodactyla	Bovidae	*Bison cf. antiquus*	Bison
Aves		*Uria aalge*	Murre



Sources: USGS Professional Paper 782, Geologic Map of the San Francisco North Quadrangle, San Francisco, and Marin Counties, California; Geology mapped in 1948-61, by J. Schlocker, M.G. Bonilla, D.H.Radbruch, C.A. Kaye, and W.I. Konkoff. San Francisco South Quad mapped by Bonilla (1964). USGS Topographic Maps, 7.5 Minute Series: San Francisco North, 1993; San Francisco South, 1993; Oakland West, 1993; Hunters Point, 1993.

0 2,000 4,000

Scale in Feet

1:24,000

TRANS BAY CABLE PROJECT EIR	Map 1. GEOLOGIC UNITS/PALEONTOLOGICAL SITES (SAN FRANCISCO SHEET)	2006

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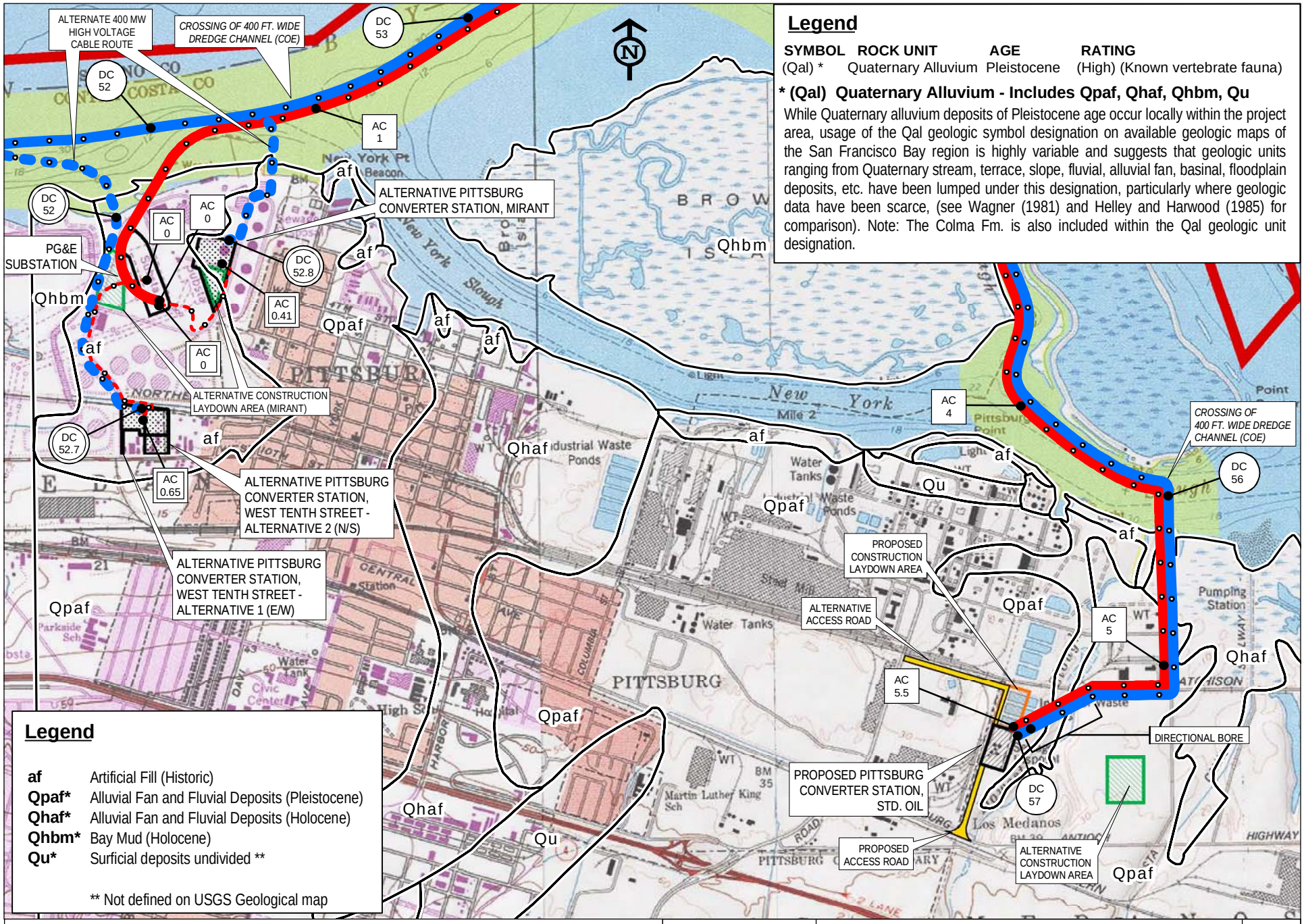

Legend

SYMBOL	ROCK UNIT	AGE	RATING
(Qal) *	Quaternary Alluvium	Pleistocene	(High) (Known vertebrate fauna)

*** (Qal) Quaternary Alluvium - Includes Qpaf, Qhaf, Qhbm, Qu**

While Quaternary alluvium deposits of Pleistocene age occur locally within the project area, usage of the Qal geologic symbol designation on available geologic maps of the San Francisco Bay region is highly variable and suggests that geologic units ranging from Quaternary stream, terrace, slope, fluvial, alluvial fan, basinal, floodplain deposits, etc. have been lumped under this designation, particularly where geologic data have been scarce, (see Wagner (1981) and Helley and Harwood (1985) for comparison). Note: The Colma Fm. is also included within the Qal geologic unit designation.

Legend

af	Artificial Fill (Historic)
Qpaf*	Alluvial Fan and Fluvial Deposits (Pleistocene)
Qhaf*	Alluvial Fan and Fluvial Deposits (Holocene)
Qhbm*	Bay Mud (Holocene)
Qu*	Surficial deposits undivided **

** Not defined on USGS Geological map

0 2,000 4,000
Scale in Feet
1:24,000

Sources: USGS OFR 97-98.

TRANS BAY CABLE PROJECT EIR

Map 2. GEOLOGIC UNITS/PALEONTOLOGICAL SITES (PITTSBURG SHEET)

2006

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APPENDIX A
(UCMP) PALEONTOLOGICAL DATA
VERTEBRATE LOCALITY AND SPECIMEN DATA

UCMP LOCALITY (V6030) - ANTIOCH GENERAL

Geology: *Qal*
Geologic Age/Land Mammal Age Quaternary - Pleistocene/Rancholabrean

Taxa: Equid (Horse Group) - *Equus*
Element (s): tooth, upper molar

UCMP LOCALITY (V1604) - ANTIOCH GENERAL

Geology: *Qal*
Geologic Age/Land Mammal Age Quaternary - Pleistocene/Rancholabrean

Taxa: Proboscidia (Elephant Group) - Mastodon
Element (s): Skull fragments, Tusk fragment, teeth ,scapula fragment, vertebra

UCMP LOCALITY (V4008) - ANTIOCH 2

Geology: *Qal*
Geologic Age/Land Mammal Age Quaternary - Pleistocene/Rancholabrean

Taxa: Camelidae (Camel Group) - *Camelops*
Element (s): radius - distal end

Taxa: Edentata (Sloth Group) - *Paramylodon sp.*
Element (s): astragalus

Taxa: Bovidae (Bison - Cow Group) - *Bison sp.*
Element (s): tooth - lower molar

Taxa: Equid (Horse Group) - *Equus sp.*
Element (s): tooth, upper molar

UCMP LOCALITY (V6007) - ANTIOCH 3

Geology: *Qal*
Geologic Age/Land Mammal Age Quaternary - Pleistocene/Rancholabrean

Taxa: Proboscidia (Elephant Group) - *Mammut sp.* (Mammoth)
Element (s): calcaneum, vertebra, tooth fragments

UCMP LOCALITY (V1604) - ANTIOCH GENERAL

Geology: *Qal*
Geologic Age/Land Mammal Age Quaternary - Pleistocene/Rancholabrean

Taxa: Proboscidia (Elephant Group) - *Mammuthus sp.* (Mammoth)
Element (s): skull fragments

Taxa: Equid (Horse Group) - *Equus sp.*
Element (s): skull, pelvis

Taxa: Bovidae (Bison - Cow Group) - *Bison sp.*
Element (s): humerus - distal end

Note: Data include localities from Qal (including Qmz equivalents in the project area - Sacramento-Delta region in order to establish paleontological and geological context.

APPENDIX K EMF INFORMATION

Information pertaining to electric and magnetic fields (EMF) associated with transmission lines is discussed in this appendix. The discussion provides overview of the physical parameters of EMF and also provides a synopsis of issues regarding the potential risk to human health.

K.1 INTRODUCTION

There is a lack of consensus in the scientific community regarding potential public health impacts due to electric and magnetic fields (EMFs) at the levels generated by electric power facilities. Furthermore, there are currently no federal standards or State CEQA standards for defining health risk from EMF and for limiting human exposure to EMFs, from transmission lines or substation facilities in California. As such, EMF is not considered in this EIR as a CEQA issue and no discussion is provided pertaining to potential impacts and a level of significance determination. However, recognizing that there is a great deal of public interest and concern regarding potential health effects from exposure to, EMFs from power lines, information regarding EMFs associated with electric utility facilities and the potential effects to public health and safety is provided in this section. Refer to Section A.3.6 in Appendix A of this EIR for Project-specific information regarding EMF.

K.2 ELECTRIC AND MAGNETIC FIELDS (EMF)

Electric and magnetic fields and the electromagnetic forces they represent are an essential part of the physical world. The earth produces EMFs, mainly in the form of DC (also called static fields). Electric fields are produced by thunderstorm activity in the atmosphere. Near the ground, the DC electric field averages less than 200 volts per meter (V/m). Much stronger fields, typically about 50,000 V/m, occur directly beneath electrical storms. Magnetic fields are thought to be produced by electric currents flowing deep within the Earth's molten core. The DC magnetic field averages around 500 milligauss (mG). The electric field and the magnetic field are considered and depicted in Physics as electric field lines and magnetic field lines, respectively, that surround an electric current in a conductor. The sources of EMFs are the charged fundamental particles of matter (principally electrons and protons). Electromagnetic forces are partly responsible for the cohesion of material substances and they mediate all the processes of chemistry, including those of life itself (e.g., photosynthesis, respiration, etc.). Electric and magnetic fields also occur naturally within animal life-forms in association with nerve and muscle activity. The EMFs in the environment caused by human technological application of the electromagnetic spectrum include uses such as communications, appliances, and the generation, transmission, and local distribution of electricity.

K.2.1 Electric Fields - Strength and Screening

Electric fields from power lines are created whenever the lines are energized. The strength of the field is dependent directly on the voltage. Alternating current (AC) fields induce weak electric currents in conducting objects, including humans. Electric field strength is typically described in terms of kilovolts per meter (kV/m). Electric field strength attenuates (reduces) rapidly as the distance from the source increases. At close proximity beneath large transmission lines, strong electric fields can cause hair on the exposed head or arms to vibrate

slightly at 60 Hz which is felt by some people as a tingling sensation, as well as cause other static electricity effects. EMFs from transmission lines can also in some circumstances cause nuisance shocks from voltages created by EMFs on objects like ungrounded metal pipes (see Section K.3.2. below).

Potential health effects from exposure to electric fields from power lines are typically not of concern since electric fields are easily screened. Anything that is even slightly conducting will have a screening effect which is why houses screen the field inside them and other physical features in the environment, such as trees, hedges, building materials, and even human skin, can provide screening as well, since they are all sufficiently conducting for this purpose. If the screen is grounded, the earth itself is included in the screen.

K.2.2 Magnetic Fields - Strength and Screening

Magnetic fields are produced by current, which is the flow of electricity. Current, which is measured in amperes (amps) can be likened to the volume of water flowing in a hose when the nozzle is open. Anything that uses or carries mains electricity is potentially a source of power-frequency magnetic fields, which modulate the Earth's steady natural fields. The strength of the magnetic-field modulation depends on the current (often referred to as the load) carried by the equipment. In the case of a power line, the strength of the magnetic-field varies according to the demand for power at any given time. Magnetic fields are usually measured in microteslas (μT) or nanoteslas (nT). One nanotesla is one thousandth of a microtesla. One tesla is one newton per ampere meter (1N/Am). Another unit often used is 1 milligauss = 0.1 microteslas. Typical magnetic field strengths for distribution lines in communities vary from 1 to 80 milligauss under the line. Typical magnetic field strengths for transmission lines vary from 1 to 300 milligauss at the edge of the right-of-way.

The magnetic field produced by a current in a conductor falls with distance from the conductor according to various physical variables and mathematical functions. For example, the inverse square of distance function ($1/r^2$) is obeyed for either a single circuit or a two-circuit but untransposed phasing transmission line. This means that the field strength is reduced to a quarter at double the distance from the line, and at three times the distance, the field is reduced to a ninth, and so on. The inverse cube of distance function ($1/r^3$) is obeyed for a transmission line with transposed phasing, or for a domestic appliance. Per this function, at double the distance the field is reduced to an eighth, and at three times the distance the field is reduced to a twenty-seventh, and so on. Where there is more than one current forming part of one or more electrical circuits, there is also partial cancellation between the magnetic fields produced by the individual currents, and that cancellation generally becomes better at greater distances. Overall, the magnetic field is highest at the point of closest approach to the conductors and falls quite rapidly with distance. Therefore, overhead lines produce a magnetic field which peaks underneath the conductors and falls rapidly with distance at either side. In addition, magnetic fields (as well as electric fields)

depend on the clearance above ground of the line. The minimum ground clearance of a 400 kV line is 7.6 m, dropping to 5.5 m for low-voltage distribution lines, but it is rare for lines to be this low, and the ground-level field falls rapidly with the height of the line above ground. In summary, the maximum fields that are produced by a line occur directly underneath the line, underneath the lowest point of the conductors, which is usually towards the middle of each span (National Grid EMF Unit, 2006).

Unlike electric fields, magnetic fields are little affected by physical features and much harder to screen. The two ways to screen magnetic fields include use of "high permeability" alloys such as mu-metal, or use of a conducting screen such as aluminum. The magnetic field induces currents in the conducting screen which generates its own magnetic field which partially cancels the original field. However, this usually requires quite thick metal plates to be effective.

K.2.3 Power Lines and Frequencies

The two basic types of power lines are transmission lines and distribution lines. Transmission lines are high-voltage power lines that allow electric power to be carried efficiently over long distances from electrical generation facilities to substations near urban areas. In the United States, most transmission lines use alternating current (AC) and operate at voltages between 50 and 765 kV (1kV or kilovolt = 1,000 V). Utilities companies use lower-voltage distribution lines to bring power from substations to businesses and homes. Transformers change the high voltages used by transmission lines to the lower voltages used by distribution lines. Distribution lines operate at voltages below 50 kV. For residential customers, these levels are further reduced to 120/240 V once the power reaches its destination.

The frequency of an AC power line is determined by the rate at which electric and magnetic fields change their direction each second defined by the term Hertz (Hz). One Hertz equals one cycle per second. For power lines in the United States, the frequency of change is 60 times per second and is defined as 60 Hertz. The electromagnetic spectrum covers an enormous range of frequencies from direct current at near-zero Hz to gamma rays at 10^{22} Hz. The higher the frequency, the shorter the distance between one wave and the next, and the greater the amount of energy in the field. Microwave frequency fields, with wavelengths of several inches (ca. 2,450 MHz), have enough energy to cause heating in conducting material. Still higher frequencies like X-rays (ca. 10^{17} Hz) cause ionization—the breaking of molecular bonds, which damages genetic material. In comparison, power frequency fields have wavelengths of more than 3,100 miles (5,000 km) and consequently have very low energy levels that do not cause heating or ionization.

K.2.4 Public Exposure to EMFs

Public exposure to EMFs in developed areas is widespread and encompasses a very broad range of field intensities and durations. In developed areas, EMFs are prevalent from the use of electronic appliances or equipment and existing electric power lines. In general, distribution lines exist throughout developed portions of the community and represent the predominant source of public exposure to power line EMF. Transmission lines are much less prevalent in most developed areas and therefore they generally represent a much lower contribution to overall public exposure to power line EMF. In undeveloped and natural areas, only low level naturally occurring EMFs exist. Measurable EMFs are not present except in the vicinity of existing power line corridors.

K.2.5 The EMF and Public Health Risk Issue

A substantial amount of research investigating both electric and magnetic fields has been conducted over the past 20 years; however, much of the body of national and international research regarding EMF and public health risks remains contradictory or inconclusive. Research related to EMF can be grouped into three general categories including cellular level studies, animal and human experiments, and epidemiological studies. These studies have provided mixed results, with some studies showing an apparent relationship between magnetic fields and health effects while other similar studies do not. For example, some epidemiological studies have suggested that a link may exist between exposure to power frequency EMFs and certain types of cancer, primarily leukemia and brain cancer. Other studies have found no such link. Laboratory researchers are studying how such an association is biologically possible. The beginning of this health concern issue can generally be attributed to publication of the results of a 1979 epidemiological study by Nancy Wertheimer and Ed Leeper (1979). This study claimed to observe an association between the wiring configuration on electric power lines outside of homes in Denver and the incidence of childhood cancer. However, criticism of the study noted that Wertheimer and Leeper did not actually measure magnetic fields from power lines. Instead, they classified the homes according to their wiring code. The wiring code was then used as a surrogate for the powerline magnetic field, which was unmeasured and unknown. Following publication of the Wertheimer and Leeper study, there have been many epidemiological, laboratory, and animal studies regarding EMF that have been conducted. The following websites provide numerous references regarding studies that have been conducted:

- World Health Organization, 2006. http://www.who.int/peh-emf/project/en/
- Medical College of Wisconsin, 2005. http://www.mcw.edu/gcrc/cop/powerlines-cancer-FAQ/toc.html
- EMF RAPID, 2006. http://www.niehs.nih.gov/emfrapid/home.htm

- National Institute of Environmental Health Sciences, National Institutes of Health, 2006. http://www.lessemf.com/pamphlet.html

AC fields create weak electric currents in the bodies of people and animals. This is one reason why there is a potential for EMFs to cause biological effects. Currents from electric and magnetic fields are distributed differently within the body. The amount of this current, even if a person is directly beneath a large transmission line, is extremely small (millionths of an ampere). The current is too weak to penetrate cell membranes; it is present mostly between the cells. Extremely Low Frequency (ELF) fields are known to interact with tissues by inducing electric fields and currents in these tissues. However, the electric currents induced by ELF fields commonly found in our environment are normally much lower than the strongest electric currents naturally occurring in the body such as those that control the beating of the heart.

Currents from 60-Hz EMF's are weaker than natural currents in the body, such as those from the electrical activity of the brain and heart. Some scientists argue that it is therefore impossible for EMFs to have any important effects. Other scientists argue that, just as a trained ear can pick up a familiar voice or cry in a crowd, so a cell may respond to induced current as a signal, lower in intensity yet detectable even through the background "noise" of the body's natural currents. Numerous laboratory studies have shown that biological effects can be caused by exposure to EMFs. In most cases, however, it is not clear how EMFs actually produce these demonstrated effects (EMF-Link, 2006a.). Table K-1 provides some reference values for electric field strengths generated by common household items at a distance of 12 inches.

TABLE K-1
TYPICAL 60-HZ ELECTRIC FIELD VALUES FOR HOUSEHOLD ITEMS AT 12 INCHES DISTANCE

Household Item	Electric Field Strength (kV/m)
Electric Blanket	0.25
Broiler	0.13
Stereo	0.09
Refrigerator	0.06
Iron	0.06
Hand Mixer	0.05
Coffee Pot	0.03

Table K-2 provides some reference values for magnetic field strengths generated by common household items. The table illustrates the phenomenon described in Section K.2.2. above, that magnetic field strength drops off as a mathematical function with distance. The

following website is a good source of additional values for magnetic field strength values from sources in the workshop and the office environments (EMF-Link, 2006b).

TABLE K-2
TYPICAL 60-HZ MAGNETIC FIELD VALUES (IN MILLIGAUSS) WITH DISTANCE FROM HOUSEHOLD ITEMS[1]

Item	1.2 Inches Distant	12 Inches Distant	39 Inches Distant
Microwave Oven	750 to 2,000	40 to 80	3 to 6
Clothes Washer	8 to 400	2 to 30	0.1 to 2
Electric Range	60 to 2,000	4 to 40	0.1 to 1
Fluorescent Lamp	400 to 4,000	5 to 20	0.1 to 3
Hair Dryer	60 to 20,000	1 to 70	0.1 to 3
Television	25 to 500	0.4 to 20	0.1 to 2

1 Source: Pacific Gas and Electric Company (2005)

In summary, it is possible that future studies will provide sufficient information to establish whether EMFs are a hazard to human health. The newer studies may also show that factors other than EMFs were responsible for effects reported in earlier studies. It is also possible that, even with more research, there will be no scientific resolution to the EMF issue in the near future. As such, the future course of the EMF and public health risk issue will likely involve factors such as: 1) reevaluating the meaning of existing scientific evidence, 2) speculation about the possible results of future studies, and 3) individual perceptions about the relative importance of various potential health risks.

K.3 OTHER RELATED PUBLIC CONCERNS

Other public concerns related to electric power facility projects, are both safety and nuisance issues, and include: 1) radio/television/electronic equipment interference; 2) induced currents and shock hazards; and 3) potential effects on cardiac pacemakers. Each of these concerns is described below.

K.3.1 Radio/Television/Electronic Equipment Interference

Although solar and atmospheric EMF can generate high frequency energy that may interfere with broadcast signals or electronic equipment, this is generally not a problem for transmission lines. The Institute of Electrical and Electronic Engineers (IEEE) has published a design guide (IEEE, 1971) that is used to limit conductor surface gradients so as to avoid electronic interference.

Gap discharges or arcs can also be a source of high frequency energy. Gap discharges occur when an arc forms across a gap in loose or worn line hardware. It is estimated that over 90

percent of interference problems for electric transmission lines are due to gap discharges. Line hardware is designed to be problem-free, but wind motion, corrosion, and other factors can create a gap discharge condition. When identified, gap discharges can be located and remedied by utilities.

Electric fields from power lines do not typically pose interference problems for electronic equipment in businesses since the equipment is shielded by buildings and walls. However, magnetic fields can penetrate buildings and walls thereby interacting with electronic equipment. Depending upon the sensitivity of equipment, the magnetic fields can interfere with equipment operation.

K.3.2 Induced Currents and Shock Hazards

EMF can induce voltages and currents on conductive objects, such as metal roofs or buildings, fences, and vehicles. When a person or animal comes in contact with a conductive object a perceptible current or small secondary shock may occur. Secondary shocks cause no physiological harm; however, they may present a nuisance.

K.3.3 Cardiac Pacemakers

A public concern issue pertaining to electric fields from transmission lines has been the possibility of interference with cardiac pacemakers. There are two general types of pacemakers: asynchronous and synchronous. The asynchronous pacemaker pulses at a predetermined rate. It is generally immune to interference because it has no sensing circuitry and is not exceptionally complex. The synchronous pacemaker, however, pulses only when its sensing circuitry determines that pacing is necessary. Interference from transmission line electric field may cause a spurious signal on the pacemaker's sensing circuitry. However, when these pacemakers detect a spurious signal, such as a 60 Hz signal, they are programmed to revert to an asynchronous or fixed pacing mode of operation, returning to synchronous operation within a specified time after the signal is no longer detected. Cardiovascular specialists do not consider prolonged asynchronous pacing a problem, since some pacemakers are designed to operate that way. Periods of operation in this mode are commonly induced by cardiologists to check pacemaker performance. So, while transmission line electric fields may interfere with the normal operation of some of the older model pacemakers, the result of the interference is generally not harmful, and is of short duration.

K.4 METHODS TO REDUCE EMF

EMF levels from transmission lines can be reduced in three primary ways including shielding, field cancellation, or increasing the distance from the source. Shielding for electric fields, was described previously under Section K.2.1. It was noted that shielding is effective for the electric fields because they can be blocked by most materials, but is of limited effectiveness for magnetic fields.

Magnetic fields resultant from transmission lines can be reduced either by cancellation or by increasing the receptor (i.e., human, animal, or electrical equipment) distance from the source. Cancellation typically is achieved in one of two ways depending on the facility. For a single transmission line circuit consisting of three "phases" (i.e., the three separate conductors on a transmission tower), the configuration of these three conductors can reduce magnetic fields. Due to the three conductors being relatively close together, the cancellation of the respective fields from each wire is enhanced. This technique has practical limitations because of the potential for short circuits if the wires are placed too close together. There are also worker safety issues to consider if spacing is reduced. For a double transmission line circuit (i.e., more than three phase wires), cancellation can be accomplished by arranging phase wires from the different circuits near each other.

The distance between the source of fields and the receptor can be increased by either placing the wires higher above ground, laying deeper underground and underwater cables, or by increasing the width of the ROW. As described previously, for transmission lines, these methods can prove effective in reducing fields because the reduction of the field strength drops rapidly with distance.

K.5 POLICIES, STANDARDS, AND REGULATIONS

A number of counties, states, and local governments have adopted or considered regulations or policies related to EMF exposure. The reasons for these actions have been varied; in general, however, the actions can be attributed to addressing public reaction to and perception of EMF as opposed to responding to the findings of any specific scientific research. Following is a brief summary of regulatory activity regarding EMF.

K.5.1 International Guidelines

The International Radiation Protection Association (IRPA), in cooperation with the World Health Organization, has published Section 8 of the June 13, 1995, draft of the report of NCRP Scientific Committee 89-3 on Extremely Low Frequency Electric and Magnetic Fields, which contains its conclusions and recommendations guidelines for electric and magnetic field exposures. Neither of these organizations has any governmental authority nor recognized jurisdiction to enforce these guidelines. These are based on the 1989 IRPA approved interim EMF exposure guidelines prepared by its International Non-Ionizing Radiation Committee. The guidelines recommended the following limits for occupational exposure and for exposure of the general public in Table K-3.

The IRPA committee based its recommendations on the premise that the existing literature does not provide evidence that EMF exposures at present-day levels have a public health impact that would require corrective action. Its summary position was that "although some epidemiological studies suggest an association between exposure to 50/60 Hz fields and

TABLE K-3
IRPA CONCLUSIONS AND RECOMMENDATIONS
FOR INTERIM EXPOSURE GUIDELINES

Exposure	Electric Field Strength	Magnetic Field Strength at Edge of ROW
Occupational: Whole Working Day	10 kV/m	0.5 mT (=5,000 mG)
Short Term	30 kV/m	5.0 mT (=50,000 mG)
Restricted to Limbs	-	25.0 mT (=250,000mG)
General Public: Up to 24 hours/day		0.1 mT (=1,000 mG)
Few hours/day	10 kV/m	1.0 mT (=10,000mG)

Source:

cancer, others do not. Not only is this association not proven, but present data do not provide any basis for health assessment useful for the development of exposure limits."

Further, the IRPA guidelines were developed "primarily on established or predicted health effects produced by currents induced in the body by external EMFs," and those limits correspond to induced current densities that are generally at, or slightly above, those attributable to normal excitation currents occurring physiologically in the body. Thus, the IRPA-recommended exposure limits are orders of magnitude greater than field levels that may create a risk, in the light of extensive evidence reviewed in this report. For the general public, the limits are 4.2 kV/m for electric fields, and 830 mG for magnetic fields. (Micro Wave News, 2006).

K.5.2 National Guidelines

Although the U.S. EPA has conducted investigations into EMF related to power lines and health risks, no national standards have been established. Several bills addressing EMF have been introduced at the congressional level and have provided funding for research; however, no bill has been enacted that would regulate EMF levels.

K.5.2.1 The EMF RAPID Program

The National EMF Research and Public Information Dissemination (RAPID) Program was established by Congress as part of the Energy Policy Act of 1992 to address the question of whether EMF produced by the generation, transmission, and use of electricity poses a risk to human health. The RAPID Program directed the National Institute of Environmental Health Sciences (NIEHS) to submit a report to Congress on the Program's findings and conclusions about health concerns related to EMF. The NIEHS released its report to Congress in June of 1999. The report concluded that the "NIEHS believes that the probability that ELF-EMF

exposure is truly a health hazard is currently small." The report also suggested that the electric industry continue its current practices, such as educating the public about EMF, and siting and designing power lines to reduce magnetic fields.

K.5.2.2 NAS Working Group Report

The National Academy of Sciences (NAS) also was involved in the RAPID Program. In May 1999, the NAS/National Research Council committee released an evaluation of the research conducted under the RAPID Program and the 1998 NIEHS Working Group Report (Edison Electric Institute, 2006). Conclusions of the NAS committee include:

- "The results of the EMF-RAPID Program do not support the contention that the use of electricity poses a major unrecognized public health danger."
- "Labeling power-frequency magnetic fields as a class 2B human carcinogen (possible human carcinogen) conveys to the public a conclusion that our committee believes is not supported by the underlying research."
- There is no need that "further special research program focused on possible health effects of power-frequency magnetic fields be funded."

K.5.3 State of California EMF Exposure Guidelines

K.5.3.1 California EMF Program

The California EMF Program's charge is to support research and provide education about whether exposure to EMF generated by the use of electricity can affect human health. The program goal is to foster a rational and fair approach to dealing with the potential hazards, if any, of exposure to EMF. This goal is accomplished through research, policy analysis, education, and technical assistance. California Public Utilities Commission (CPUC) Decision D.93-11-013 created the California Electric and Magnetic Fields (EMF) Program to research and provide education and technical assistance on the possible health effects of exposure to electric and magnetic fields from powerlines and other uses of electricity. In addition to funding research and policy analysis on this issue, the EMF program provides education and technical assistance to government agencies, professional organizations, businesses, and members of the general public. Under the CPUC decision, this program is funded by money provided by the State's investor-owned utilities, and is based in the California Department of Health Services (DHS). The California EMF Program produces periodic reports to the CPUC, and its goal is to make its research, policy analysis, and educational products useful to the CPUC in future decision-making. (California EMF Program, 2006).

K.5.3.2 CPUC Guidelines

Although not applicable to the proposed Trans Bay Cable Project, based on the California EMF Program, the CPUC requires that utilities use "low-cost or no-cost" mitigation measures for facilities requiring certification under General Order 131-D. The decision directed the utilities to use a 4 percent benchmark on the low-cost mitigation. The CPUC did not adopt any specific numerical limits or regulation on EMF levels related to electric power facilities. In Decision D.93-11-013, the CPUC addressed mitigation of EMF of utility facilities and implemented the following recommendations (California Public Utilities Commission, 2002):

- No-cost and low-cost steps to reduce EMF levels
- Workshops to develop EMF design guidelines
- Uniform residential and workplace programs
- Stakeholder and public involvement
- A four-year education program
- A four-year non-experimental and administrative research program
- An authorization of federal experimental research conducted under the National Energy Policy Act of 1992.

K.6 SUMMARY

Currently, there is no scientific consensus about the EMF human health risk issue except for a general agreement that better information is needed. Induced currents from AC fields have been a focus for research on how EMFs could affect human health. This is because epidemiological studies have found associations between increased cancer risk and power-line configurations which are thought to be surrogates for magnetic fields. No such associations have been found with measured electric fields.

K.7 REFERENCES

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