APPENDIX L
CULTURAL RESOURCES TECHNICAL REPORTS

Appendix L1
Archaeological Reconnaissance, Willow Pass Generating Station, Contra Costa County, California
(Submitted Separately Under the Rules of Confidentiality)

Appendix L2
Historical Resources Inventory and Evaluation Report WPGS

HISTORIC RESOURCES INVENTORY AND EVALUATION REPORT

Mirant Willow Pass Generation Station

PREPARED FOR

URS Corporation
221 Main Street, Suite 600
San Francisco, California 94105-1917

May 2008

PREPARED BY

JRP Historical Consulting, LLC
1490 Drew Avenue, Suite 110
Davis, California 95618

SUMMARY OF FINDINGS

URS Corporation contracted with JRP Historical Consulting, LLC (JRP) to prepare this Historical Resources Inventory and Evaluation Report for historic buildings, structures, and objects located potentially affected by the Mirant Corporation's proposed Willow Pass Generation Station (WPGS) project in Pittsburg, California (Appendix I, Figures 1 and 2). The project will add two natural-gas–fired combined-cycle generators to the site and remove the existing decommissioned Units 1 through 4.

The purpose of this document is to comply with the California Environmental Quality Act (CEQA), as it pertains to historical resources, and to assess whether the architectural resources located within the project study area (Appendix A, Figure 3) should be considered historical resources for the purposes of CEQA; that is, whether they are listed in, determined eligible for, or appear eligible for listing in the California Register of Historic Resources (CRHR). 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, and Appendix B (g) of the California Energy Commission "Rules of Practice and Procedure and Power Plant Site Certification Regulations."

The site of the WPGS is on the south bank of the Suisun Bay in Pittsburg, in Contra Costa County, California (**Appendix A**, Figures 1, 2, and 3). The plant is built on low ground with marshland to the west. It is within the City of Pittsburg, which comprises a mix of post-World War II development and modern redevelopment. Pittsburg began as a steamboat stop between San Francisco and Sacramento during the gold rush in the mid-nineteenth century. As the gold rush dissipated, coal was found in the vicinity in 1855. Industry grew around Pittsburg, especially accelerating after Columbia Geneva Steel opened in 1906, and again during and following World War II. Pacific Gas and Electric Company (PG&E) started construction on the current Pittsburg Power Plant (PPP) in 1951, with Units 1 through 4 completed in 1954. Unit 5 was added in 1960 and Unit 6 followed the next year. The last addition was Unit 7 in 1972. The PPP was a part of the general trend of post-World War II electrical generation expansion to accommodate increasing industry and population. PG&E built the steam power plant to supply power to the growing East San Francisco Bay Area and portions of the Central Valley, areas that grew rapidly in population after the war. PG&E's previous reliance upon hydroelectric power could no longer supply the need, and PG&E and other electric companies in California built many steam power plants during this period to meet the growing demands.

The study area for historical resources for this project also defined as the Area of Potential Effect or APE, included one resource that required full inventory and evaluation: the PPP (including WPGS site) itself. The other resource within the study area was a water treatment plant that was less than 45 years old. The linear components of the project were subject to reconnaissance-level survey. Please refer to **Appendix A** for project location (Figure 1), a site plan (Figure 2), and

study area (Figure 3). The DPR 523 form for the PPP is presented in **Appendix B**, and results of the reconnaissance of the linear route are presented in Section 4. This report concludes that the proposed WPGS site at 696 10th Street and the linear route do not contain buildings, structures, or objects that appear to meet the criteria for listing in the CRHR. None of these resources are considered historical resources for the purposes of CEQA. **Appendix C** includes the results of the literature search.

TABLE OF CONTENTS

SUMMARY OF FINDINGS i

1. PROJECT DESCRIPTION 1
   - 1.1. Introduction 1
   - 1.2. WPGS Site Location 2
   - 1.3. Other Project Component Locations 2
2. RESEARCH AND FIELD METHODS 4
3. HISTORIC OVERVIEW 7
   - 3.1. History of Pittsburg and its pre-World War II Industrial Growth 7
   - 3.2. Development of Transportation 8
   - 3.3. Industrial Development in the Second Half of the 20th Century 10
4. DESCRIPTION OF RESOURCES 16
   - 4.1. Pittsburg Power Plant 16
   - 4.2. Character of Areas Surrounding the Linear Route 17
5. FINDINGS AND CONCLUSIONS 26
   - 5.1. Evaluation Criteria 26
   - 5.2. Evaluation 27
6. PREPARERS' QUALIFICATIONS 30
7. BIBLIOGRAPHY 31

ATTACHMENTS

Appendix A: Figures
Appendix B: DPR 523 Forms
Appendix C: Literature Search Results

1. PROJECT DESCRIPTION

1.1. Introduction

The Willow Pass Generating Station (WPGS) will consist of new 550 megawatt (MW) natural-gas–fired electric generating facilities and ancillary systems. The project consists of construction of new generating units that will become the WPGS; construction of electric and gas transmission lines adjacent to the WPGS facility; and construction of water supply and wastewater pipelines connecting to the Delta Diablo Sanitation District Wastewater Treatment Plant (DDSD WTP) (Appendix A, Figure 1).

The new WPGS units, consisting of two power blocks each containing one Siemens Flex Plant 10 (FP10) combined-cycle unit, are to be constructed wholly within the existing Pittsburg Power Plant (PPP) site. The FP10 combined-cycle units will have a generating capacity of approximately 550 MW (net) when both are operated together, assuming a temperature of 75 degrees Fahrenheit (°F) and 54 percent relative humidity. The WPGS units are expected to operate at a 40 to 50 percent capacity factor. The WPGS FP10 units will use air-cooled heat exchanger (ACHE) technology to reduce consumptive water use. The generator output from the WPGS will be stepped-up to 230-kilovolts (kV). Commercial operation for the FP10 units is expected by summer 2012.

The WPGS site will encompass approximately 26 acres of the approximately 1000-acre PPP site that are currently occupied by existing power generation Units 1 through 4, which are now retired and which were last operated in 2003; an unused surface impoundment; an administration building; one unused #6 fuel oil storage tank (Tank 7); temporary buildings; and other ancillary facilities. Construction of the new power generation facility is expected to occur over a 33-month period (from October 2009 through June 2012). Construction (including demolition) is expected to cost approximately $585 million (in 2008 dollars).

As shown on Appendix A Figure 2, all construction laydown and parking areas will be within the PPP site and adjacent PG&E switchyard property. The WPGS will be interconnected to the existing Pacific Gas and Electric Company (PG&E) switchyard adjacent to the WPGS site. The WPGS will use natural gas that will be delivered via a new onsite gas pipeline, which will be constructed to carry natural gas from the existing PPP metering station to the WPGS site. The process water source will be recycled water from the DDSD system. Two new offsite water lines approximately 5 miles long will be constructed to bring recycled water from, and return wastewater to, the DDSD WTP. Potable water will be supplied by the City of Pittsburg from an existing onsite underground potable water piping system.

1.2. WPGS Site Location

Appendix A, Figure 1 and 3 show the project location in relation to the surrounding area. The WPGS will be located within the existing PPP site located at 696 West 10th Street, Pittsburg, CA 94565. The WPGS site will be located on a separate legal parcel to be created by adjusting the lot lines of two existing legal parcels at the PPP site, both of which are identified as Assessor's Parcel Number 085-010-014, in the City of Pittsburg, within Contra Costa County, California. The WPGS site is located on Township 2 North, Range 1 East, on the U.S. Geological Survey Honker Bay Topographic Quadrangle Map. The PPP site is located directly south of Suisun Bay and approximately 2 miles west of the center of the City of Pittsburg. The majority of the PPP site was annexed into the City of Pittsburg in June 2008.

The new WPGS parcel will be approximately 26 acres and will be separate from the existing PPP site. The parcel will be purchased by Mirant Willow Pass, LLC from Mirant Delta, LLC. The new generating units will be located on the south 23.5 acres of the WPGS site. The north 2.5-acre portion of the WPGS site (adjacent to Suisun Bay) is included to preserve existing riparian water rights; no land disturbance will occur within this area. PG&E owns a 36-acre switchyard adjacent to the PPP site, directly southwest of the WPGS site (Appendix A, Figure 2).

The WPGS site is currently occupied by the existing retired power generation PPP Units 1 through 4, an unused surface impoundment, an administration building, hazardous materials and hazardous waste materials buildings, Tank 7, temporary buildings, and other ancillary facilities. The project includes the demolition of Units 1 through 4, the administration building, and Tank 7 that are on the WPGS site, as well as replacement of the hazardous materials and hazardous waste buildings. The unused surface impoundment on the WPGS site (north of Tank 1) will be left in place.

1.3. Other Project Component Locations

The project includes the following components that would be located outside the WPGS site but within the PPP site and the adjacent PG&E switchyard property:

- Approximately 21.5 acres of construction, laydown, parking, and office areas;
- Approximately 2,700 feet of new natural gas line which connects immediately upstream of the existing PPP gas meter station (with a dedicated meter);
- Approximately 1,600 feet of new transmission lines which connect to the PG&E switchyard;
- A new hazardous material building and a new hazardous waste building, which will be located on the PPP site west of existing Unit 7.

The above features will all be located on previously disturbed, graded, or paved areas of the PPP and adjacent PG&E switchyard property. As indicated, the gas interconnection line will run from the existing gas supply system upstream of the existing gas metering station within the PPP site, to a new metering station within the WPGS property, through gas conditioning systems, to the WPGS compressor enclosure. Electric transmission lines will connect directly to the PG&E switchyard adjacent to the WPGS site.

The project will also involve the demolition of one hazardous materials storage building and one hazardous waste storage building that are currently on the WPGS site. New buildings will be constructed outside of the WPGS and within the PPP site. These new buildings will be used to store hazardous materials and hazardous waste for existing PPP operations as well as the WPGS operations. The project also includes the demolition of the surface impoundment located west of Tank 1, just north of the WPGS site; this area will be used for construction laydown and parking.

In addition, wholly within WPGS, the project will include a new potable water line, approximately 1100 feet in length, which will connect to an existing potable water line on the PPP property. The existing potable water line connects to the City of Pittsburg water line located along West 10th Street. A new sanitary line, approximately 1050 feet in length, will also be constructed to connect the WPGS site to the existing sanitary line on the PPP site. Sanitary waste will be conveyed to DDSD WTP via an existing sewer line. The new potable water line and sanitary line will be located entirely within the WPGS site.

The project also includes an offsite component that extends beyond both the WPGS and PPP site boundaries consisting of 5-mile-long water supply and waste water discharge lines connecting the WPGS site to the DDSD WTP. The water pipeline alignment traverses a portion of the PPP site and continues along Union Pacific Railway and the Pittsburg-Antioch Highway, entering the DDSD WTP from the south Three miles of the five-mile-long route currently contains an unused fuel oil pipeline owned by Mirant Delta, which historically was used to convey oil between the Contra Costa Power Plant and the PPP. The unused fuel oil pipeline now out of service and will be replaced by the new water pipelines. The DDSD WTP is located at 2500 Pittsburg-Antioch Highway in Antioch, California. No offsite roadway improvements are required for the WPGS.

2. RESEARCH AND FIELD METHODS

JRP examined standard sources of information that list and identify known and potential historical resources to determine whether any buildings, structures, objects, districts, or sites had been previously recorded or evaluated in or near the project study area. The study area, also known as the Area of Potential Effect (APE) is presented in Appendix A, Figure 3. JRP reviewed the National Register of Historic Places (NRHP), California Register of Historic Resources (CRHR), California Historical Landmarks, California Points of Historical Interest, and the California Office of Historic Preservation Directory of Properties in the Historic Property Data File (NPS, 2008; OHP, 1992, 1996, and 2004).

URS Corporation conducted a records search at the Northwest Center of the California Historical Resources Information Center at Sonoma State University for this project on April 29, 2008 (NWIC File #07-1526) and provided the results to JRP. The Northwest Information Center had recorded 38 previous studies within one mile of the site and within one-quarter mile of the water supply and discharge pipelines. As a result, three sites were within the project study area boundaries for historic resources, 14 sites within a mile of the WPGS site, and 28 within a quarter-mile of the pipeline route have been inventoried and evaluated (see Table 1). Maps indicating the location of previous studies and DPR 523 forms for the inventoried resources are provided in Appendix C.

The City of Pittsburg maintains a list of Historic Resources per city ordinance (Municipal Code 15.84). The list of 33 resources is located within the General Plan (City of Pittsburg, 2004). Twenty-seven of the resources are associated with the New York Landing Historical District concentrated between 3rd Street and 6th Street, Cumberland Street, and Black Diamond Street. The district lies east of the WPGS site within 1 mile of the project. The only other historic resources within 1 mile of the project site and a quarter-mile of the linear route are the Pittsburg Mine Railroad (originally crossed the Pittsburg-Antioch Highway east of Loveridge Road) and the Camp Stoneman Gates (Railroad Avenue south of Route 4). The full list and district map are provided in Appendix C.

JRP conducted fieldwork at the PPP on November 29, 2007 and recorded the property on the appropriate DPR 523 forms (Appendix B). JRP conducted additional fieldwork and a reconnaissance survey along the linear route on May 14, 2008. JRP conducted research at a variety of libraries and repositories, including: California State Library, Sacramento; and Shields Library, University of California, Davis. Mirant provided materials from the files at the Pittsburg Power Plant.

JRP prepared the historic context in Section 3 to address pertinent themes of industrial development in Pittsburg, and steam-generated power technologies, and evaluated the PPP for historic significance within that context under CRHR and NRHP criteria (see DPR 523 forms, Appendix B). The description and historical evaluation of the resource, as well as discussion of

the reconnaissance of the linear route, are summarized in Sections 4 and 5. Refer to Section 6 for JRP staff professional qualifications, and to the references listed in Section 7 for a complete listing of materials consulted.

Table 1
Previously Inventoried and Evaluated Properties

Resource #	Name	Location	Eligibility
P-07-813	Southern Pacific Railroad line	West Pittsburg to Antioch	Not Eligible
P-07-2775	Los Medanos Wasteway and Culvert	Contra Costa Canal to Suisun Bay	Not Eligible
P-07-505	Southern Pacific: Northern Contra Costa Route	Tracy to Oakland via Carquinez Straight	Not Eligible
P-07-864	Redwood Manufacturers Company		Not Evaluated[1]
P-07-869	Warehouses/Industrial Buildings	East 3rd Street and Harbor Street	Not Eligible
P-07-1936	Carlo's Pizzeria	2099 Railroad Avenue	Not Eligible
P-07-1922	Camp Stoneman Warehouses	105, 107, 541-553 Bliss Avenue	Not Eligible
P-07-2501	Residence	920 Power Avenue	Not Eligible
P-07-2502	Residence	395 Andrew Avenue	Not Eligible
P-07-2503	Residence	820 Power Avenue	Not Eligible
P-07-2504	Residence	776 Power Avenue	Not Eligible
P-07-2505	Residence	408 Power Avenue	Not Eligible
P-07-2506	Residence	367 Power Avenue	Not Eligible
P-07-2507	Residence	338 Power Avenue	Not Eligible
P-07-2508	Residence	296 Power Avenue	Not Eligible
P-07-2509	Residence	292 Power Avenue	Not Eligible
P-07-2510	National Guard Armory	99 Power Avenue	Not Eligible[2]

[1] The form records historic-era archeological remains at the Redwood Manufacturers Company site, including concrete footings and redwood pipe. The site is about one mile east of the WPGS site and north of the linear route.

[2] The Pittsburg National Guard Armory was originally inventoried in 1999. At that time, S. Lassell with Jones & Stokes stated that the armory appeared eligible under Criterion C as an example of standard plans and location conforming to post-World War II guidance. In January 2001, the Federal Highway Administration submitted a project review, and a determination of eligibility was made in 2001 recording the property as "appears eligible for listing in National Register as a separate property." The U.S. Army submitted a project review in March of 2003 and the Office of Historic Preservation (OHP) determined the armory ineligible through consensus in the same month. For the purposes of this chart, the most recent, and concurred, result has been used.

Table 1 Previously Inventoried and Evaluated Properties (Continued)			
Resource #	**Name**	**Location**	**Eligibility**
P-07-814 through 817, P-07-818 through 824	Residences	967, 959, 953, 947, 941, 929, 935, 923, 919, 913, 907 Carpino Way	Not Eligible
P-07-826	MLK Elementary School	950 El Pueblo Avenue	Not Eligible
P-07-825	Residences	875 El Pueblo Avenue	Not Eligible
P-07-827	Contra Costa Industrial Park	1501 Loveridge Road	Not Eligible
P-07-828	National Energy Contractors plant	1600 Loveridge Road	Not Eligible
P-07-829	Church of Christ	283 Diane Avenue	Not Eligible
P-07-830	Biltmore Market	263 Diane Avenue	Not Eligible
P-07-831 through 836	Residences	255, 243, 231, 223, 213, 201 Diane Avenue	Not Eligible
P-07-2323	Pittsburg X-ray Facility	WPNSTASB DET Concord Loveridge Road	Not Eligible
P-07-2769	Southern Pacific Railroad Camp Stoneman Spur	Continues southwest from Pittsburg Antioch Highway	Not Eligible
P-07-2743	El Pueblo Housing Complex	Roughly bounded by Carpino Avenue, Treatro Avenue, Carpino Way and El Pueblo Avenue	Not Eligible
P-07-487	Southern Pacific: northern Contra Costa Route Spur Line	Sommerville Road and Pittsburg Antioch Highway	Not Eligible
P-07-2772	PG&E South Tower – Contra Costa Transmission Line	N. Side Route 4 between Harbor Way and Century Blvd.	Not Eligible
C-1149	Millingstone School Site		Not Evaluated[3]

[3] C-1149 is the record of a pestle or cobble found at the Highlands School site and removed by a citizen. The item was returned years later.

3. HISTORIC OVERVIEW

The following section provides historical background and information regarding the history of general industrial development and electrical power production in and around the City of Pittsburg, focusing on the study area. This information provides appropriate historical context within which to evaluate the historical significance of the resources under review.

3.1. History of Pittsburg and its pre-World War II 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 the tract was purchased by Colonel J.D. Stevenson and Dr. W.C. Parker. 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 influx of Gold Rush miners soon diminished, the discovery of coal in the vicinity in 1855 revitalized the town's economic activities. By 1860, several coal mines operated in the area, with three railroad lines extending from the mines near Mount Diablo to river wharves, one in "New York," 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 (Purcell, 1940:189, 190, 353, 698; Emanuels, n.d.:225-227; CDMG, 1951:223-225, 349-357). The discovery of higher quality coal in Oregon and Washington resulted in a decline in mining in the hills to the south of the town through the 1880s, and eventually ceased in the early twentieth century (Purcell, 1940:369-369).

The development of Pittsburg received another economic boost in the early 1900s. The German Loan and Savings Bank foreclosed on then rancho owner L.L. Robinson. The lands were purchased by C.A. Hooper, who re-platted the town (Purcell, 1940:676).[4] Hooper's industrial enterprises led to additional growth. In 1903, C.A. Hooper established the Redwood Manufacturing Association (later Redwood Manufacturers Company), which produced shingles, lumber, millwork, and before prohibition, wine tanks. Hooper also partnered with Charles M. Gunn and W.E. Creed to begin producing steel for the west coast in 1906, establishing Columbia Steel at Pittsburg. The steel plant would become the foundation of the local economy in the early twentieth century. The town's industrial base continued to expand, and during this time wood-processing and rubber manufacturing companies established facilities in Black Diamond. The appearance of heavy industry in the area led the city to change its name to Pittsburg in 1911, and the industrial tradition continued in the city throughout the twentieth century. Several

[4] According to Purcell, Hooper "laid out" the townsite, but earlier in her book she indicates that the town was laid out in 1849 as discussed above.

chemical plants in particular located there, as well as the Lanteri Shipyards (Purcell, 194:182-83, 189-190; Emanuels, n.d.:225-228; City of Pittsburg, 2008).

3.2. Development of Transportation

In addition to being on a navigable waterway, Pittsburg is or has been also located along the lines of three major California railroads: the Southern Pacific (SPRR, now the Union Pacific), the Atchison, Topeka, and Santa Fe (AT&SF, now the Burlington Northern and Santa Fe, or BNSF), and the Sacramento Northern (USGS, 1953b). The right-of-way for the Sacramento Northern line forms the southern boundary of the PPP and the water supply and discharge pipeline follow the former SPRR tracks.

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" (defined as less than 7 miles each) from the rugged mine sites, northward to various landings on the south shore of Suisun Bay. Trains brought the coal to landings where it was taken by ship to San Francisco for local and industrial use. The Pittsburg Railroad, also known as the Pittsburg and Black Diamond Railroad, ran from the mining camp of Somersville to New York Landing, east of Pittsburg Point. Mine production declined in the later nineteenth century; the railroad closed in the early 1900s, with the tracks being removed at some point between 1916 and 1931. The former alignment for the Pittsburg Railroad crosses the linear route east of Loveridge Road. The City of Pittsburg lists the Pittsburg Railroad on its list of Historical Resources as the "site of a historic event." The list does not include a specific location or physical description for the Pittsburg Railroad other than "Pittsburg-Antioch Highway." Reconnaissance of the site indicates no substantial above-ground structures exist because alterations to California Avenue, the Kirker Creek channel, the SPRR, and the Pittsburg-Antioch Highway have obscured all traces of the Pittsburg Railroad. The former rail alignment within the reconnaissance study area does not retain original materials, design, workmanship, setting, association, or feeling and therefore did not require further study (USGS, 1905, 1908, and 1953a; CDMG, 1951:223-225, 349-357).[5] The portion of the former rail alignment where the linear route crosses has already been disturbed by the SPRR tracks and is not of historic value.

A major rail line connecting the City of Pittsburg with the rest of the state was not constructed 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 the City of Pittsburg. After leaving Pittsburg, the route took a

[5] Cheryl Brookshear of JRP contacted City of Pittsburg planner Ligha Schmidt on May 29, 2008 regarding the location of the Pittsburg Railroad historical resource on the City of Pittsburg Historical Resources list. The department did not have any information on the boundaries of the resource and are investigating further.

southeasterly turn through Tracy to join with the main San Joaquin Valley line at Lathrop Junction. SPRR operated this line, which parallels the linear route, as a major segment of its freight service until the Union Pacific Railroad (UPRR) gained control of the line by acquiring SPRR in 1996 (Heath, 1945:10-11, passim). This former SPRR line runs generally east-west. At the point where the Pittsburg-Antioch Highway curves to the east, the linear route departs from the railroad right-of-way to parallel the highway alignment. This former junction of the road and railroad was originally called "Los Medanos;" however, the Pittsburg Railroad tracks were removed at some point before 1931 and the site does not retain historic integrity. The SPRR line has been previously recorded on DPR 523 forms (see P-07-00813, Appendix B), but the tracks, ties, ballast, and equipment have been extensively refurbished and upgraded since its construction, and the line 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 SPRR 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 Railroad (AT&SF) 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 SPRR'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, which would pass through the cities of Antioch and Pittsburg, and terminate 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 Story and James Dun, the chief engineer for the AT&SF, undertook the work in 1898, completing the line to Point Richmond in 1900 (Bryant, 1974:173-181; L.L. Waters, 1950:133-140; Rice et al., 1988:217-236). The former AT&SF railway intersects the linear route south of Willow Pass Road, but is otherwise outside the study area. The line has been previously recorded on DPR 523 forms (see S-32572 and S-30387, 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.

The Sacramento Northern Railway right-of-way crosses the study area in an east/west direction just south of the PPP. The line was first built by the Oakland, Antioch, and Eastern Railway (OA&E), an interurban electric railway, which ran from Pittsburg to Walnut Creek by the early 1900s. The OA&E and its franchised railways eventually provided interurban electric railway service between the City of Pittsburg and Sacramento, including stops in Antioch. The railway established a ferry just west of the site in 1912 to link its Oakland-to-Pittsburg track with the Suisun-to-Sacramento track. The ferry operated from Mallard Slough to Chipps Island. In 1928, the OA&E merged with the Sacramento Northern Electric Railway into a system that covered 182 miles from San Francisco Bay to Chico (Heath, 1945:10-11, passim). The line of the

Sacramento Northern runs parallel to the south side of the proposed project site. 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.

3.3. Industrial Development in the Second Half of the 20th Century

World War II and the associated 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 U.S. Steel and one of the dominant industries in the Pittsburg area, had steadily expanded operations since the company first opened early in the twentieth century, supplying steel casings for machinery used in dredges, ships, and the lumber industry. Although U.S. 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. The buildings that housed these companies are outside of the study area to the south and southwest (Barkley, 1954; CDMG, 1951:248; Mosier, 2005; USGS, 1953b).

3.3.1. Development of Pittsburg Power Plant

By the time that the PPP facility opened, steam-powered generation already had a long history in California. These plants had been the first electric-generating facilities in the state. British designer Sir Charles Parsons built the first steam-turbine–generator in 1884; almost immediately, others began making improvements upon his original concept, but the earliest steam-generating plants were little more than steam engines converted to drive a generator rather than a locomotive. By the beginning of the twentieth century, engineers designed steam turbines to replace the original steam-engine power plants. Aegidius Elling of Norway is credited with creating the first applied method of injecting steam into the combustion chambers of a gas-turbine engine in 1903-1904 and within a relatively short time, the technology and capacity of these engines to supply power and electricity rapidly grew. These advances soon brought electricity to a wide range of industrial and domestic applications; however, the materials needed to withstand the high temperatures of modern turbines were not available in these early stages of the technology. Improvements in steam-turbine engines advanced throughout the 1920s and 1930s, leading to a generation of more efficient turbine power plants by the 1950s, when the PPP was originally designed and built. During this time, utilities also retired or replaced many of the older steam-electric plant generating units and constructed more modern units (Termuehlen, 2001:11, 21-28; Beck and Wilson, 1996:30; Myers, 1984:8).

Steam power generation was part of California's power production throughout the twentieth century, although the role of steam generation diminished considerably during the pre-World War II era when massive hydroelectric generating plants came on line throughout the state. As

early as 1920, hydroelectric power accounted for 69 percent of all electrical power generated in California. In 1930, that figure had risen to 76 percent; and by 1940, hydroelectric sources provided 89 percent of California's electricity. Rapid construction of new thermal, or steam-powered electric-generating units, however, accounted for most of the new generation capacity in the state after World War II. By 1950, hydroelectricity accounted for only 59 percent of the total power generated, falling to 27 percent in 1960. Some new hydroelectric plants were built during the 1960s, chiefly associated with federal and state water projects; but by 1970, hydroelectric plants accounted for only 31 percent of all electricity generated in California (Williams, 1997:374).

These statistics, however, tend to obscure the work of PG&E and Southern California Edison (SCE), California's largest electrical utility providers, which both built large-scale steam-generation plants as early as the 1920s. James Williams, a historian of energy policies and practices in California, noted that the decision by PG&E and SCE to build steam plants may be attributed to several converging trends in the mid- to late-1920s. First, a persistent drought in California caused the major utilities to begin to question the reliability of systems relying so heavily upon hydroelectricity. This drought began in 1924 and continued, intermittently, for a decade. At about the same time, new power plants on the East Coast (where steam had always played a more important role than in California) achieved far greater efficiencies than had previously been possible. Between 1900 and 1930, for example, the fuel efficiency of steam plants, measured in kilowatts per barrel of oil, increased more than nine-fold. In addition, new natural gas lines were completed that could bring new supplies to both Northern and Southern California in the late 1920s, tapping large reserves in the San Joaquin Valley. Natural gas has played an important role in steam electric power generation in California since that time (Williams, 1997:278; Coleman, 1952:306).

The confluence of these various factors—a drought, new steam-generator technologies, and new supplies of natural gas—induced PG&E, SCE, and other utilities to begin construction of large steam plants during the late 1920s and early 1930s. In 1929, the Great Western Power Company (absorbed by PG&E in 1930) built a large steam plant on San Francisco Bay, near the Hunters Point shipyard, fitted with two 55-MW generators.6 PG&E also built a steam plant in Oakland in 1928, called Station C, and a few years later a PG&E vice-president for engineering wrote: "under the circumstances which now prevail, it is natural to question the future of hydro in California" (Electrical West, 1928:80-81; Spencer, 1961:294, 300; Williams, 1997:279).

But it was in response to the demands of post-World War II growth in California that PG&E built new steam generation plants throughout the state. Wartime increases in population continued after the end of hostilities, and general statewide economic expansion spurred rapid

[6] This plant still exists. It was fitted with new units in 1948, at the same time that the Kern Power Plant was being constructed (Coleman, 1952:298).

growth in the residential, commercial, and industrial sectors. The need to generate power was imperative, and PG&E expanded their systems along with the rest of California's energy industry. Between 1946 and 1953, PG&E invested $1 billion in infrastructure and generating facilities. Because most of the more favorable hydroelectric sites in California had already been developed, and the cost of steam-generating facilities had been reduced by technological developments in design and abundant natural gas resources, steam plants became the more favorable option. Steam turbine power plants were cheaper and quicker to build than hydroelectric plants and utility companies moved away from hydroelectricity during this period—steam turbines became the generator of choice. Such plants conserved water and minimized costs for the business and the consumer (Myers, 1984:200; Williams, 1997:277-78, 282-83; Coleman, 1952:331).

PG&E steam generation plants built during the postwar period relied upon proven technologies and were assembled quickly and inexpensively relative to earlier plants. In a detailed article in 1950 in *Civil Engineering*, PG&E Chief Engineer I.C. Steele summarized the design criteria that went into construction of four major steam plants the company had under construction at that time, at Moss Landing, Contra Costa, Kern, and Hunters Point in San Francisco. These plants had much in common with each other and with other steam plants under construction in the state. The site selection criteria were the same in all cases: close to load centers to reduce transmission costs; accessibility to fuel supplies; near a water supply; in a location where land was inexpensive; and on land that could provide a good foundation. By the mid-1950s, Walter Dickey, an engineer from Bechtel, touted recent design innovations that improved the economics of steam plant construction even more. These plants, he argued, could be built economically by minimizing the structural material, chiefly by creating semi-outdoor turbo-generator units. Furthermore, virtually all of these plants were designed to be expanded if market conditions warranted, and most of them were (Steele, 1950:17-21; Garbarini, 1953:31-33; Dickey, 1956: 253-273).

The decades between 1950 and 1970 were the years of peak expansion of steam-generating capacity for PG&E, SCE, and other utility companies. PG&E operated 15 steam electric plants in California in 1950, and during the following decade added several new plants and expanded older ones. Chief among these were the Kern plant (1948-1950), Contra Costa (1951-1953), Moss Landing (1950-1952), Pittsburg (1953-1954), Morro Bay (1955), Hunters Point (addition 1958), and Humboldt Bay (1956-58). At the time of its construction, the PPP was the largest steam station in the west, with a capacity of over 680 MW when the first four units were complete.[7] By the late 1970s, there were more than twenty fossil fuel thermal plants in California owned by various power companies and clustered around San Francisco Bay, the greater Los Angeles area, and in San Diego County, along with a few interior plants in San

[7] At its height, PPP generated 2,080 MW, Units 5 and 6 generated 660 MW, Unit 7 740 MW, leaving 680 MW to be generated from Units 1 through 4 (Mirant Delta LLC, 2006:2-12).

Bernardino County and Riverside and Imperial Counties, and a few on the Central Coast (Southern California Edison Company, various years; Spencer, 1961:280-302; Steele, 1950:17-19; Dickey, 1956:253-255; Southwest Builder and Contractor, 1962:24-27; Williams, 1997:257).

Most of the oil- or gas-fired steam plants currently in use in California were installed during the period between 1950 through 1970. After 1970, the major utilities began to investigate alternative energy sources, ranging from nuclear power to wind, geothermal, and other renewable green energy sources, other than traditional thermal or hydroelectric systems. Despite these efforts, however, fossil fuel steam generation provides the majority of electrical generating capacity in California, and there are currently 34 steam turbine power plants in California of a variety of ages and locations.[8]

The PPP was constructed in 1951-1954 as a part of the rapid expansion of electrical generation following World War II. PG&E purchased the land in 1951. The site was located within 10 miles of the Contra Costa Power Plant, which had just been completed. The site met the requirements for a suitable power plant site: near a growing demand source, access to water and fuel, and cost effective. PG&E hired Bechtel Corporation to engineer and construct the $80 million plant. The PPP had several similarities with other plants PG&E was constructing as a part of its $1 billion expansion, including the construction of four generating units and off-shore docks (Reference #12) for the delivery of fuel oil similar to the plans for Contra Costa and Moss Landing (Southwest Builder and Contractor, 1951:18; Coleman, 1952:334).[9] PPP continued the trend of increasing generating capacities, using four 125,000 kW General Electric generators to produce over 100,000 kW more than the Contra Costa plant's four generators. The generators were powered by steam turbines supplied by boilers that burned oil, with backup natural-gas capability (Williams, 1997:323; PG&E, no date [a]:1-5; Dickey, 1956:255).

The semi-outdoor plan was new to PG&E, but had previously been used in southern California by Southern California Edison at its Etiwanda Steam Station, which was constructed between 1951 and 1953. The semi-outdoor plan eliminated the housing around the turbines, and generators reduced costs. For the PPP and Contra Costa plant, PG&E engineers applied several engineering techniques previously used on other industrial building types, and recorded these in an article in ASCE *Transactions*. Designers improved seismic performance of the walls of the warehouse and shop by using brick or tile facing with reinforced grout between the two faces.

[8] The California Energy Commission retains figures on the fuel type for all electricity used in the state, even if the power is generated out of state. In 1999, natural-gas–fired generators were responsible for 31 percent of all electricity used in the state, compared with 20 percent for hydroelectricity. Coal-fired steam plants, all of them out of state, accounted for 20 percent of the total. "Green" sources accounted for 12 percent. The percentage of in-state natural-gas–fired steam electricity is much larger than 31 percent, since all of the coal and much of the hydroelectric power is generated out of state. See www.energy.ca.gov/electricity/system_power.

[9] Moss Landing used an offshore pumping platform to unload tankers delivering oil. A submarine pipeline connected the on-shore tanks with the platform.

The 18-foot-diameter and 200-foot-high stacks were tested extensively to prevent wind damage. The PPP also used a different construction method for the fuel oil storage tanks. The tanks were constructed with concrete slabs, and wrapped in pre-tensioned wire before being coated in protective gunite. The plant was designed to support both local and system-wide load. Local transmission of power generated by Units 1 and 2 was handled by a 115-kV switchyard and system transmission of power generated by Units 3 and 4 by a 230-kV switchyard (Reference #28). The switchyards had their own control building (Reference #29) at the northern edge of the yard (Southern California Edison Company, 1954:2-3, 5, and 14; Dickey, 1956:255, 263, 266, 271; PG&E, no date [a]; Historic Aerials, 2008). In addition to the four generating units, waterside crane (Reference #18), six oil tanks, and oil-loading dock (Reference #12), the plant had a brick administration building and retention basin (Reference #10). During planning and construction, the administration building was reconfigured to its current "T" shape from the original plan for a rectangular building at right angles to the plant itself.[10]

The continued growth of electrical demand resulted in the addition of Units 5 and 6 in 1960 and 1961. The units added 660 MW of power and nearly doubled the plant's capacity (Mirant Delta LLC, 2006:2-12. The new units, while larger than the previous, used the same architecture and were aligned with the previous units. Babcock and Wilcox manufactured the boilers with PG&E engineers designing the rest of the units. The boilers were larger, with a height of 189 feet, compared to 153 feet for Units 1 through 4. The larger boilers were able to provide sufficient steam that the turbines could power two generators each. Unit 5 used a Westinghouse turbine and two Westinghouse generators. Unit 6 used General Electric equipment with the same output. Units 5 and 6 were designed to share equipment with Units 1 through 4. The generator deck was placed at the same height so all six generators could use the same 60-ton gantry crane. Additional pumps were added to the water intake so the units could share the existing water supply system. One bay was added to the western 230-kV switchyard and four bays were added to the 115-kV switchyard. The major difference between Units 5 and 6 and the preexisting Units 1 through 4, is that Units 5 and 6 were designed to use natural gas as their primary fuel and oil as a backup supply (PG&E, no date [b]).

PG&E brought Unit 7 online in 1972. The new unit was much larger than the previous six and was not aligned with the others. Unit 7 can produce 740 MW of electricity. The unit was designed separately from Units 1 through 6 and shares few facilities with them. However, the layout allowed for a potential future Unit 8 adjoining Unit 7. The manufacturers provided the designs for the major components, the boiler and turbine-generator structure. Combustion Engineering Inc., who constructed the boiler, designed and constructed the onsite boiler support. Westinghouse designed the turbine and generator, and provided specifications for the turbine pad and generator deck surrounding them. Like Units 5 and 6, Unit 7 was designed to use natural gas

[10] Coleman, 1952, Architect's rendering between 326 and 327; compare to rendering in Dickey, 1956:254.

as its primary fuel with the option to use oil if necessary. Tank 7 west of the six existing tanks was provided by Pittsburg-Des Moines Steel Company, and is constructed of steel, unlike other units, which are constructed of concrete slab. The switchyard (Reference #28) was expanded with two additional 230-kV lines to Sobrante supplied by Unit 7. Unit 7 is a closed-cycle system that reuses cooling water, and required two new retaining basins for make up water, water treatment facilities (Reference #14), ammonia tanks (Reference #24) for the condenser equipment, and cooling towers (Reference #22 and #23) and canal (PG&E, 1971:1-1, 1-2, 1-7, 2-4, 10-1, 16-2, 21-2).

During 1968 to 1979, several other structures and buildings were added to the PPP. Additional tanks were added south of the plant. PG&E also constructed the warehouse (Reference #15), rail car shed (Reference #19), load center (Reference #13), storage shed (Reference #21), and insulating and coatings shop (Reference #26). The first building of the center complex (Reference #27) and the first hazardous materials (Reference #30) building were laid out (comparison of aerial photographs 1968 and 1979 from Historic Aerials, 2008). Although all units were completed and operating by 1972, the plant expansion continued. Between 1979 and 1987, covered parking (Reference #2) was added to the plant between the administrative building and the storage tanks. A small retaining pond (Reference #8) was added, and the western hazardous materials building (Reference #31) was constructed. East of Units 5 and 6, PG&E added a small storage building (Reference #16) and circulator pump buildings (Reference #17). The hazardous materials buildings were completed in 1993 when a second (Reference #32) building was added. The auditorium (Reference #3) and training facilities (Reference #5) along with the oblong storage (Reference #6) necessitated the relocation of several areas of covered parking to the west of Tank 7. The warehouse was also expanded during this period. PG&E sold PPP to Mirant in 1998 as a part of the restructuring of power regulation and Mirant has continued to add features to the plant (PG&E, 1998). Between 2002 and 2005, Mirant added the electrical equipment building (Reference #4) and rebuilt the load center (Reference #13) in its current configuration, replacing a similar structure at that location. Units 1 through 4 were removed from service in 2003 (comparison of aerial photographs 2003 and 2005 from Historic Aerials, 2008; PG&E, 1998).

4. DESCRIPTION OF RESOURCES

4.1. Pittsburg Power Plant

One resource, the Pittsburg Power Plant (PPP), is included in this report. The PPP consists of seven generating units (4 of which were retired in 2003) and miscellaneous auxiliary buildings and structures. All of the buildings are industrial and utilitarian in nature and constructed of concrete, metal and synthetic materials.

The generating units, Units 1 through 7, are the predominant structures at the plant (Appendix A, Figure 2). Each unit consists of a boiler, stack, generator, and turbine. Units 1 through 4 are identical. Units 5 and 6 are located immediately adjacent to the first four and similar in configuration, but larger. Unit 7 is the largest and separated from the others. The stacks are the tallest portions of the units, with a range of 200 to 450 feet. The stacks for Units 5 through 7 are concrete and taper from a wide base. The stacks for Units 1 through 4 are uniform in width. Each of the boilers is surrounded with metal scaffolding located between the stack and generator/turbine deck. The generators are located on concrete decks above the ground level turbines.

Photograph 1: Oblique image of Pittsburg Power Plant, after 1972. Left to right, Unit 7, Units 5&6, Units 1 through 4. On display at Contra Costa Power Plant.

The area surrounding the generating units contains numerous auxiliary buildings. The most common building form is modular and temporary; examples include the temporary complex (Reference #27), auditorium (Reference #3), and training facility (Reference #5). These buildings are made up of single or multiple units, and have a faux vertical wood siding and skirt wall. The second most common form is that of the "Butler building" or prefabricated metal structure. These buildings have grooved metal siding and gable roofs as seen in the warehouse

(Reference #15), insulation and coatings building (Reference #26), and the storage shed (Reference #21). These buildings are used for storage as well as shop operations. Newer prefabricated buildings are present in the hazardous materials area (Reference #31 and #32). These side gable buildings have large overhead doors. Several buildings used to house for the protection of equipment are located at the plant. These do not have a standard form. Two of these buildings are concrete tilt-up buildings with flat roofs, including the load center (Reference #13) and the electric equipment building (Reference #4). Others are prefabricated with a synthetic siding and low gable roofs like the circulator pump building (Reference #17).

In addition to buildings, the plant includes several operational support structures. The largest of these support structures are the fuel tanks, six of which are aligned in a row along the eastern property line. A seventh is set west of the line. These tanks have corrugated siding and are surrounded by concrete containment walls. Insulated pipes connect tanks with the boilers in the generating units. The plant also has four retaining basins (References #7 through 10). These basins are rectangular concrete depressions. The walls of the basins rise 1 to 2 feet above ground level. The basins are about 3 feet deep and lined with a black rubberized plastic. A T-shaped dock (Reference #12) extends into Suisun Bay. The wooden dock is mainly unused. Intake pumps are located along the shoreline north of Units 1 through 4, partly below grade. A gantry crane (Reference #18) runs above the pumps for equipment maintenance. Gantry cranes are also located on the generator decks of the generating units. Units 1 through 6 share a single crane, and Unit 7 has a separate crane.

4.2. Character of Areas Surrounding the Linear Route

The linear route of the proposed water supply and discharge lines (Appendix A, Figure 1) follows the tracks of the former SPRR for most of the route between PPP and the DDSD WTP plant. The tracks consist of standard rails mounted on wooden ties in a bed of gravel ballast. The line was originally constructed in 1878, but has been continuously maintained and upgraded. No date stamps were observed from the public right-of-way during survey. Multiple sidings are located at the western end of the linear route at a small switchyard south of the plant. These sidings were constructed in the 1940s or 1950s. The tracks merge into one set east of Railroad Avenue.

Photograph 2: Former SPRR tracks east of Loveridge Road showing typical construction and appearance. Camera facing southeast, May 14, 2008.

The route traverses industrial, residential, and undeveloped property. The undeveloped land and industrial uses are located mainly at the east and west ends of the linear route. The industrial sites date from the World War II era to near current. The majority are large, one-story utilitarian buildings (Photograph 3). A group of light industrial and commercial buildings along the south side of the Pittsburg-Antioch Highway are smaller and more varied in appearance, although they lack any style (Photograph 4). The administrative building associated with the DDSD WTP is a two story modern structure (Photograph 5). The DDSD WTP was established in 1979, and the administration building was constructed within the last 10 years. Nearly all of the buildings along the linear route that were built in the mid-twentieth century show signs of additions and alterations. The materials used in the buildings vary, but include metal, synthetic siding, concrete, and stucco.

Photograph 3: Signode Western Operations, 1 Leslie Drive, camera facing north. Typical industrial construction along linear route.

Photograph 4: Monsam Enterprises, Inc., 2685 Pittsburg-Antioch Highway, camera facing southwest. Small light-industrial development along Pittsburg-Antioch Highway.

Photograph 5: Delta Diablo Sanitation District Administration Building.

The construction of residential areas in the study area can be divided into three periods: early twentieth century, post-World War II, and twenty-first century construction. (See Appendix A, Figure 4 for the locations of residential developments along the linear route.) The Pacini Tract between Railroad Avenue and Harbor Street is the earliest of the residential tracts adjoining the linear route. These single-story houses are wood frame with stucco siding. Each house is located on a small lot or shares a larger lot with one or more similar buildings. The majority have flat roofs with small front stoops sheltered with a variety of roof forms. These buildings are modest examples of Spanish Eclectic design, which was popular between 1915 and 1940, and is characterized by low or flat roofs with red tile covering, stucco siding, and asymmetrical facades. Details on Spanish Eclectic homes often borrow from all periods of Spanish history, but the homes in the Pacini Tract do not feature many architectural details, and instead incorporate materials like stucco and tile to create the Spanish Eclectic look. In addition to the lack of such details, many of the homes have had alterations in the form of window and doors replacements.

Photograph 6: 207-209 East 15th Street, typical homes backing onto linear route from Pacini Tract. Camera facing north.

The eastern edge of the tract has larger lots with multiple small cottages. These cottages are also one-story wood frame; however, they have gable roofs and are either wood- or stucco-sided. The roofs are either end- or side-gabled and reference Craftsman influences. Craftsman architecture is typified by low-pitched roofs with deep, open overhangs with exposed beams or brackets. Craftsman homes frequently have porches with supporting columns and pedestals. The only Craftsman detail used in these modest cottages is the deep, open eaves. The cottages are placed with one in the front of the lot and a second to the rear. In each case, windows have been replaced with vinyl or metal frame replacements.

Photograph 7: Multiple-building property in Pacini Tract, roofline of rear cottage can be seen to the right.

Parkside Manor between Railroad and Andrew Avenues, near the eastern end of the linear route is another residential subdivision that dates to the pre-war era and continued to be developed into the post-war era. Parkside Manor is typified by one-story, L-shaped ranch houses with cross-gable or cross-hip roofs. Siding choices include wood, stucco, or synthetic replacements. Houses typically have attached garages, some with original single-piece tilt-up doors; others feature modern replacements. Window and siding replacements are a common alteration.

Photograph 8: 15 Andrew Avenue, typical Parkside Manor ranch house. Camera facing southeast.

Post-World War II residential subdivisions are located at the eastern edge of Pittsburg near the mid-point of the linear route. The Central Addition along the north side of the linear route contains a number of small Minimal Traditional homes. In the core of the subdivision are some Tudor and Spanish Eclectic examples, but the edge of the subdivision facing the linear route is dominated by modest Minimal Traditional homes with side and cross gables and small partial front porches. The houses have composition shingle roofs and are sided with stucco, wood, or synthetic replacement materials. Windows are a mix of metal and vinyl replacements. Awnings of various styles are a common adornment.

Photograph 9: 14th Street facing northwest from Birch Street. Camera facing northwest.

South of the SPRR tracks and east of Harbor Street are four subdivisions, HJ and JK Siino, John Evola, Biltmore, and Lincoln Park, all developed between 1950 and 1955. Carpino Avenue runs through all four subdivisions. The homes are single-story Minimal Traditional buildings that reflect a series of stock plans with multiples repeated in groups along the road (Photograph 10).

Photograph 10: Streetscape of Carpino Avenue, showing repeating forms. Camera facing east.

The residences along Carpino Avenue consist of both single-family and duplex plans. The buildings are wood frame with stucco siding and composite shingle roofing, and each house has an attached garage with overhead door. Roof forms include gable, hip, and flat. The most common forms include covered entries recessed under the main roofline (Photograph 11), or

projecting from the main building and supported on simple posts (Photograph 12). Alterations include the replacement of garage doors, windows, and additions to side and rear facades.

Photograph 11: One of the typical minimal traditional standard plans found in the Siino Suburban Partition. Camera facing east.

Photograph 12: 651 and 653 Carpino Avenue, duplex plan found in John Evola Suburban Partition. Camera facing northeast.

Two gated developments are located along the linear route. These subdivisions are small pockets of new development in Pittsburg and were constructed between 2003 and 2005. One is southeast of the PPP entrance and the other is west of Harbor Avenue, north of the proposed linear route. Each development is walled off from the surrounding community with gates on the

major thoroughfares. The residences are two-story, with stucco siding, complex rooflines, and minimal architectural details referencing past styles.

Photograph 13: Gated subdivision southeast of the PPP entrance. Camera facing southwest.

5. FINDINGS AND CONCLUSIONS

5.1. Evaluation Criteria

JRP evaluated the properties in the study area using the criteria for the CRHR to determine if they are historical resources for the purposes of CEQA. The State of California references cultural resources in CEQA—Public Resources Code (PRC) Division 13, Sections 21000 through 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) created the CRHR and set 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 is modeled after the NRHP, and Office of Historic Preservation's instructions for interpreting and applying the California criteria include directions to use the National Park Service, *National Register Bulletin 15*, "How to Apply the National Register Criteria for Evaluation," and other National Register bulletins.[11] Eligibility for listing in the 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 CRHR Criteria 1 through 4. Properties may be significant at the local, state, or national level:

- Criterion 1: association with events or trends significant in the broad patterns of our history;
- Criterion 2: association with the lives of significant individuals;
- Criterion 3: a resource 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;
- CRHR Criterion 4: has yielded, or is likely to yield, information important to history or prehistory (OHP, 2001:69-70).

In addition to meeting one or more of the four eligibility criteria, properties considered for the CRHR must also retain *integrity*, which means "…the authenticity of an historical resource's

[11] The most widely accepted guidelines are contained in U.S. Department of the Interior, National Park Service, 1991.

physical identity evidenced by the survival of characteristics that existed during the resource's period of significance" (OHP, 2001:69-70). In other words, the significant physical features of a property must remain intact in order to communicate its significance under one or more of the significance criteria. Seven aspects of integrity are considered: location, design, setting, workmanship, materials, feeling, and association. These seven aspects 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 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.

Historic buildings, structures, and objects are rarely found eligible under NRHP Criterion D (CRHR Criterion 4). Although these properties can occasionally be recognized for the important information they might yield regarding historic construction or technologies, most are otherwise well documented and the properties themselves are not principal sources of important information.

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.
- 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.

5.2. Evaluation

Other than the PPP facility, all of the other buildings or structures within the study area were field checked to confirm that they were less than 45 years old, and that none required evaluation as exceptionally significant. The PPP facility itself is more than 45 years old and it was surveyed and 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. The PPP was evaluated under California Register and National Register criteria, as summarized below, and is not considered a historical resource for the purposes of CEQA.

Units 1 through 6[12] and associated buildings within the PPP are not significant within the context of the development of electrical generation or steam power plants (Criterion A or 1). PPP was one of several power plants built to supply the growing post-World War II demand for electricity. Companies throughout California, including PG&E, Southern California Edison, and San Diego Gas and Electric, built plants to meet the need during that period. These electrical companies built steam power plants at that time because of the lack of economical hydroelectric sites and the increased availability of oil and gas. The plants were built within a short period of time and with standardized plants. PPP is neither the first nor the last of the plants built by PG&E, whose other facilities include Kern (1948), Hunter's Point (1948), Moss Landing (1951), Contra Costa (1951), Morro Bay (1955), and Humboldt Bay (1956) (CEC, 2007). Together, these plants and associated substations supplied the power needed by PG&E and its customers, and no one plant can be singled out as individually significant within the company's system. Each was important to the community it served, providing power for the increasing demands of new technology and development. In the context of the time and other community services, the design and operational history of PPP do not suggest any unique significance.

The PPP buildings are also not significant for their design or construction (Criterion C or 3). As mentioned above, PPP was constructed during a period of rapid growth of steam-power plants. Although the construction of PPP was reported in engineering journals along with Contra Costa power plant to the east, the articles discussed the application of previous engineering developments to these plants, and do not indicate any innovative or distinct design elements employed for the PPP. The plant was the first of the PG&E plants to use the "semi-outdoor" mode, with both exposed turbine-generator bays and boilers, that was developed for other plants in the post-World War II era. The semi-outdoor plan was new to PG&E, but Southern California Edison had previously used it at its Etiwanda Steam Station, which was constructed between 1951 and 1953. The lack of cladding allowed the plants to be built faster and more economically, but did not affect their operations (Southern California Edison Company, 1954:2-3, 5, and 14). Large companies that produced major equipment for plants across the country provided the boiler, turbines, and generators. The switchyard is also constructed of standard equipment and in a typical plan. No new equipment was introduced to the design at Pittsburg.

PPP is not associated with the life of a historically significant persons (Criterion B and 2), nor is it significant under Criterion D and 4 as a potential source of data on human history. This

[12] Unit 7 and its associated buildings are less than 45 years old and have not achieved exceptional significance. Unit 7 is a common and necessary piece of infrastructure and has not made an exceptional contribution to events or technological trends within the past 50 years.

property is well documented through company records and construction documents and does not appear to be a principal source of important information. A full evaluation of this property is provided on the DPR 523 form located in Appendix B.

6. PREPARERS' QUALIFICATIONS

Meta Bunse is a partner and Project Manager at JRP Historical Consulting, LLC. Ms. Bunse has a Master's degree in Public History from California State University, Sacramento, and meets the Secretary of the Interior's Standards for historian and architectural historian. As a partner, she has had a primary role in investigation, writing, and project design, in addition to staff management and general research. Since joining JRP in 1990, she has conducted field recordation of historic resources throughout the state of California, and has conducted a substantial amount of research at many public and private repositories, including the National Archives in Washington, D.C. Ms. Bunse served as the Project Manager for this project and conducted field recordation of the main plant site, as well as providing technical oversight of the report and recordation forms.

Cheryl Brookshear is a Staff Historian at JRP Historical Consulting, LLC. Ms. Brookshear received an M.S. in Historic Preservation from University of Pennsylvania in 2000, and has worked at JRP since 2006. During her professional experience in cultural resources management, and more than 10 years in the history field, Ms. Brookshear has participated in numerous cultural resources management projects. As a Staff Historian for JRP, she has conducted field surveys throughout the state of California, and conducted research at public and private repositories in California and Nevada. Ms. Brookshear meets the Secretary of the Interior's Standards for historian and architectural historian, and her contribution to this project has been in fieldwork, research, report writing, DPR 523 form preparation, resource evaluation, and report production.

Production Technician Rebecca Flores prepared mapping and illustrations, and assisted in report production.

7. BIBLIOGRAPHY

Published Sources

Beck, Douglas Stephen and David Gordon Wilson, 1996. *Gas Turbine Regenerators.* New York: Chapman & Hall, 1996.

Bryant, Keith L., 1974. *History of the Atchison, Topeka and Santa Fe Railway*. New York: Macmillan, 1974.

CDMG (California Division of Mines), 1951. "Geologic Guidebook of the San Francisco Bay Counties," *Bulletin 154.* San Francisco, Division of Mines.

City of Pittsburg, 2004. *General Plan: Pittsburg 2020: A Vision of the 21st Century,* Adopted October 2004.

Coleman, Charles M., 1952. *PG&E of California: The Centennial Story of Pacific Gas and Electric Company.* New York: McGraw-Hill, 1952.

Dickey, Walter L., 1956. "The Design of Two Steam Electric Plants," *ASCE Transactions* (1956).

Emanuels, George, n.d. *California's Contra Costa County: An Illustrated History.* Fresno, California: Panorama West Books.

Garbarini, Edgar J., 1953. "Design Saves Construction Dollars on Contra Costa Power Plant," *Civil Engineering* (May 1953).

Heath, Erle, 1945. *Seventy-Five Years of Progress: Historical Sketch of the Southern Pacific.* San Francisco, California: Southern Pacific Bureau of News, 1945.

Myers, William A., 1984. *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company.* Glendale, California: Trans-Anglo Books, 1984.

Purcell, Mae Fisher, 1940. *History of Contra Costa County.* Berkeley, California: The Gillick Press.

R.W. Spencer, 1961. "Cooling Water For Steam Electric Stations in Tidewater, "*Transactions of the American Society of Civil Engineers* 126 (1961):294, 300.

Rice, Richard B., William Bullough, and Richard Orsi, 1988. *The Elusive Eden: A New History of California.* New York: Alfred A. Knopf, 1988.

Steele, I.C., 1950. "Steam Power Gains on Hydro in California," *Civil Engineering* (January 1950).

Termuehlen, Heinz, 2001. *100 Years of Power Plant Development: Focus on Steam and Gas Turbines as Prime Movers.* New York: ASME Press, 2001.

U.S. Department of the Interior, National Park Service, 1991. *Guidelines for Applying the National Register Criteria for Evaluation*, National Register Bulletin 15 (Washington D.C.: U.S. Government Printing Office, 1991

Waters, L.L., 1950. *Steel Trails to Santa Fe.* Lawrence: University of Kansas Press, 1950.

Williams, James C., 1997. *Energy and the Making of Modern California.* Akron, Ohio: University of Akron Press, 1997.

Maps/Aerial Photographs

Arnold, Ralph R., 1938. *Official Map of Contra Costa County.* Martinez, California: n.p., 1938.

Arnold, Ralph R. and H.C. Glass, 1914. *Official Map of Contra Costa County.* n.p., 1914.

Barkley, Josiah W., 1954. *Official Map of Contra Costa County.* Martinez, California: Contra Costa County, 1954.

Contra Costa County Aerial Photographs, 1928. University of California, Berkeley, Bancroft Library, Map collection.

Haviland, P.A., 1915. *Contra Costa County.* Oakland, California: Oakland Blue Print Company, 1915.

McMahon, T.A., 1908. *Official Map of Contra Costa County.* San Francisco: Britton & Rey.

Southern California Edison Company, various years. Annual Reports.

United States, 1950. Agricultural Stabilization and Conservation Service. *Aerial Photographs of Part of Eastern Contra Costa County, California.* Salt Lake City, Utah: U.S. Agricultural Stabilization and Conservation Service.

United States, 1958-1959. Agricultural Stabilization and Conservation Service. *Contra Costa County, California.* Sacramento: Cartwright & Company.

United States, 1966. Agricultural Stabilization and Conservation Service. *Contra Costa County, California.* Salt Lake City, Utah: Agricultural Stabilization and Conservation Service.

USGS (U.S. Geological Survey), 1905. *Mt. Diablo Quadrangle*, Scale 1:62,500, Surveyed in 1896, reprinted 1905 (Washington, D.C.: USGS).

USGS (U.S. Geological Survey), 1908. *Antioch Quadrangle* (Washington, D.C.: USGS, 1908).

USGS (U.S. Geological Survey), 1943. *Antioch.* USGS: Washington, 1908 reprinted 1943.

USGS (U.S. Geological Survey), 1953a. *Antioch North.* 7.5-minute series Topographic, aerial photos 1931 and 1941. USGS: Washington, 1953.

USGS (U.S. Geological Survey), 1953b. *Honker Bay*. USGS: Washington, 1953.

USGS (U.S. Geological Survey), 1968a. *Antioch North.* USGS: Washington, 1953 photorevised 1968.

USGS (U.S. Geological Survey), 1968b. *Honker Bay*. USGS: Washington, 1953 photorevised 1968.

USGS (U.S. Geological Survey), 1973. *Honker Bay*. USGS: Washington, 1953 photorevised 1973.

USGS (U.S. Geological Survey), 1980. *Honker Bay*. USGS: Washington, 1953 photorevised 1980.

Periodicals

ASCE, *Transactions*

Electrical West, 1929. 1928 Steam Plants Account for 45 Percent of New Generating Capacity," *Electrical West* (February 2, 1929):80-81.

Southwest Builder and Contractor, 1951. "News," *Southwest Builder and Contractor*, (October 5, 1951).

Southwest Builder and Contractor, 1962. "Haynes Steam Plant Will Grow With Demand," *Southwest Builder and Contractor* (October 12, 1962).

Unpublished Sources

Department of Parks and Recreation, 1976. *California Inventory of Historic Resources*. March.

Mirant Delta LLC, 2006. "Contra Costa and Pittsburg Power Plants Entrainment and Impingement Monitoring Plan for IEP." August.

NPS (National Park Service), 2008. National Register Information System, online database: www.nr.nps.gov. Accessed April 2008.

OHP (California Office of Historic Preservation), 1992. *California Points of Historical Interest*. Sacramento: California State Parks, May.

OHP (California Office of Historic Preservation), 1996. *California Historical Landmarks*. Sacramento: California State Parks.

OHP (California Office of Historic Preservation), 2001. *California Office of Historic Preservation Technical Assistance Bulletin #10 – California State Law and Historic Preservation: Statues, Regulations, and Administrative Polices Regarding Historic Preservation and Protection of Cultural and Historical Resources* (Sacramento: California Department of Parks and Recreation, May 23, 2001).

OHP (California Office of Historic Preservation), 2004. California Office of Historic Preservation, "Directory of Properties in the Historic Property Data File for Contra Costa County." December 3.

PG&E, no date (a). *Plant Data Units 1-4.* PG&E Record 631440. Pittsburg Power Plant, files.

PG&E, no date (b). *Plant Data Units 5 and 6.* PG&E Record 044099. Pittsburg Power Plant, files.

PG&E, 1971. *Plant Data Unit 7.* PG&E Record 052502. Pittsburg Power Plant, files.

PG&E, 1998. "Pittsburg Power Generation Plant." October.

Southern California Edison Company, 1954. *Etiwanda Steam Station.*

Online Sources

CEC (California Energy Commission), no date. www.energy.ca.gov/electricity/system_power.

CEC (California Energy Commission), 2007. *California Power Plant Database*. 2007, http://www.energy.ca.gov/database/index.html#powerplants accessed May 20, 2008.

City of Pittsburg, 2008. "History of Our City," accessed May 23, 2008, at http://www.ci.pittsburg.ca.us/pittsburg/.

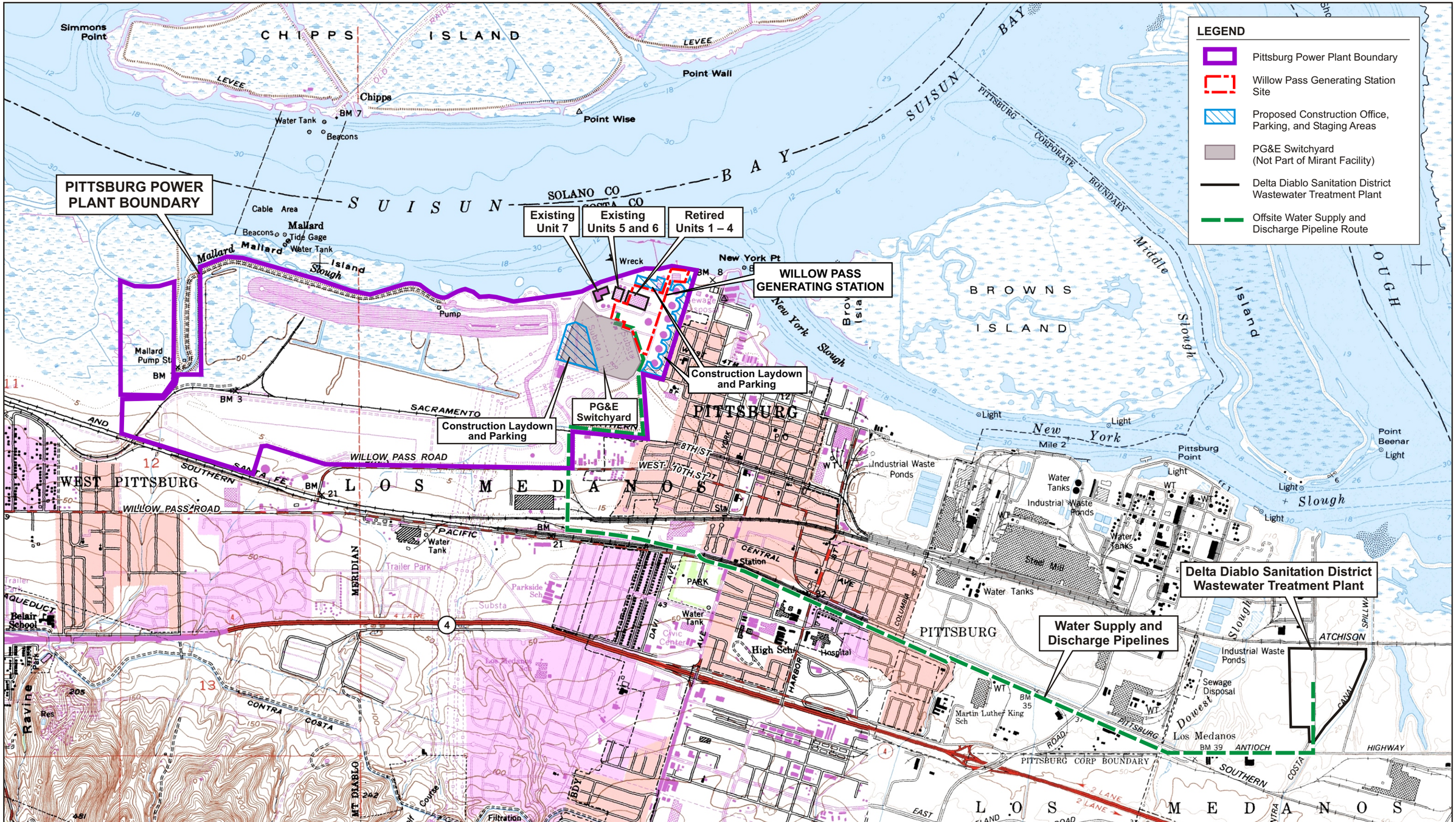
Contra Costa County Assessor's Office, 2008. *Map and Property Info.* http://ccmap.us/gis/ accessed May 12.

Historic Aerials, 2008. Pittsburg, California. http://historicaerials.com accessed May 12.

Mosier, Daniel L., 2005. *California Bricks*. http://calbricks.netfirms.com/brickhistory.html accessed September 30.

APPENDIX A:

Figures



Source:
USGS Topographic Maps, 7.5 Minute Series:
Honker Bay, CA (Rev. 1980) and
Antioch North, CA (1978)

PROJECT LOCATION MAP

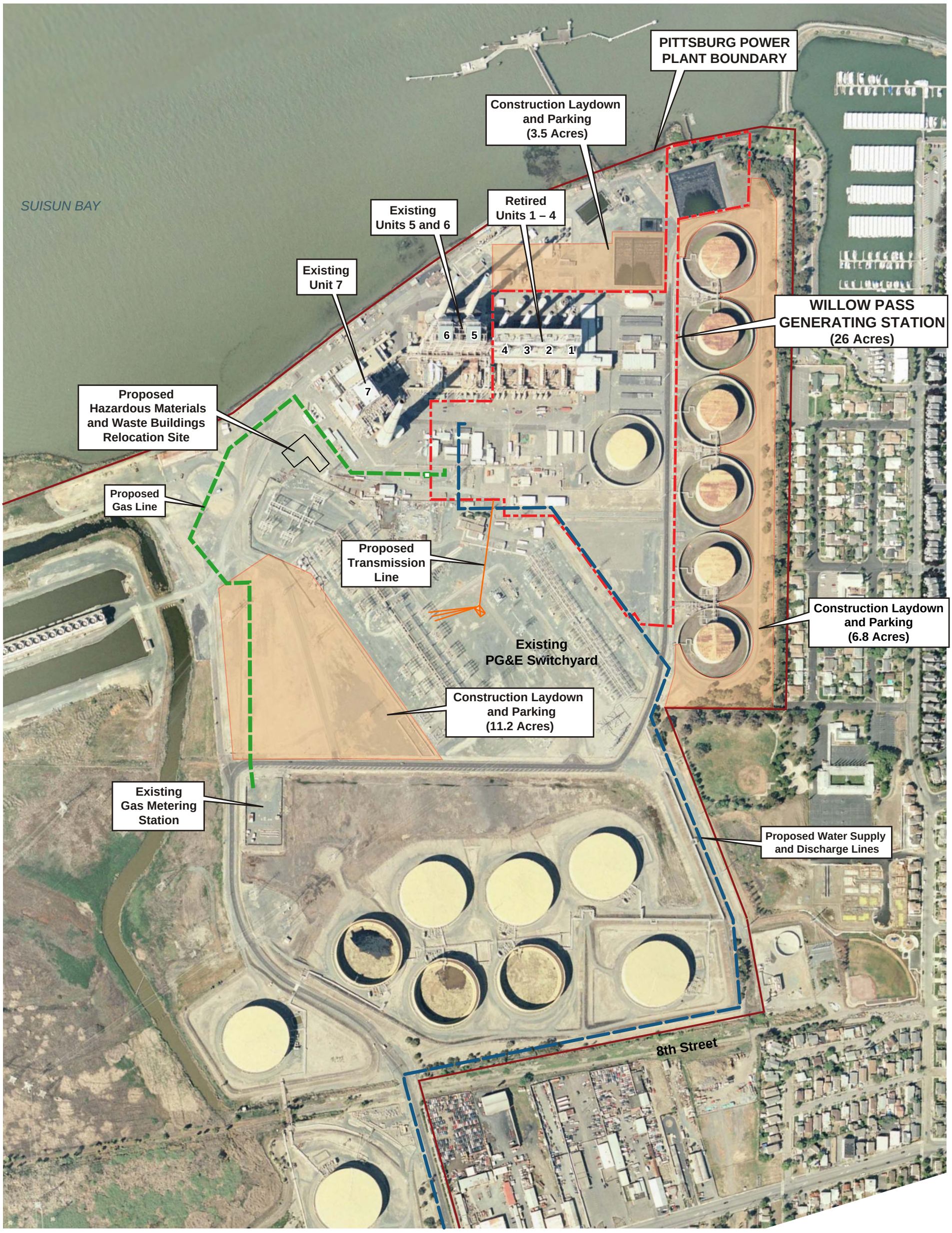
Willow Pass Generating Station
Mirant Willow Pass, LLC
Pittsburg, California

June 2008
28067343

URS

FIGURE 1

6/25/08 vsa ..T:\Mirant Pittsburg-Willow Pass\Graphics\7.03 Cultural\Fig 1_AppL-HA_proj loc.cdr



LEGEND

- Pittsburg Power Plant Boundary
- Willow Pass Generating Station Site
- Construction Laydown and Parking
- Proposed Gas Line
- Proposed Water Supply and Discharge Lines
- Proposed Transmission Line

Photo Source:
DigitalGlobe; Airphoto USA 2007

N

0 400
Scale in Feet

SITE PLAN

Willow Pass Generating Station
Mirant Willow Pass, LLC
Pittsburg, California

June 2008
28067343

URS

FIGURE 2

6/12/08 vsa ..\T:\Mirant Pittsburg-Willow Pass\Graphics\7.03 Cultural\Fig 1_AppL-HA_siteplan.ai

PITTSBURG POWER PLANT BOUNDARY

SUISUN BAY

Existing Unit 7

Existing Units 5 and 6

Retired Units 1 – 4

WILLOW PASS GENERATING STATION

Construction Laydown and Parking

PG&E Switchyard

Construction Laydown and Parking

WILLOW PASS ROAD

8TH ST

WEST 10TH ST

4

Water Supply and Discharge Pipelines

Delta Diablo Sanitation District Wastewater Treatment Plant

LEGEND

- Pittsburg Power Plant Boundary
- Willow Pass Generating Station Site
- Proposed Construction Office, Parking, and Staging Areas
- PG&E Switchyard (Not Part of Mirant Facility)
- Delta Diablo Sanitation District Wastewater Treatment Plant
- Offsite Water Supply and Discharge Pipeline Route

Proposed Historic APE:

- Full Evaluation
- Reconnaissance Survey

Photo Source:
DigitalGlobe; Airphoto USA 2007

N

0 2000 4000 Feet

0 0.5 1 Miles

Scale 1:24,000

HISTORIC ARCHITECTURAL AREA OF POTENTIAL EFFECTS

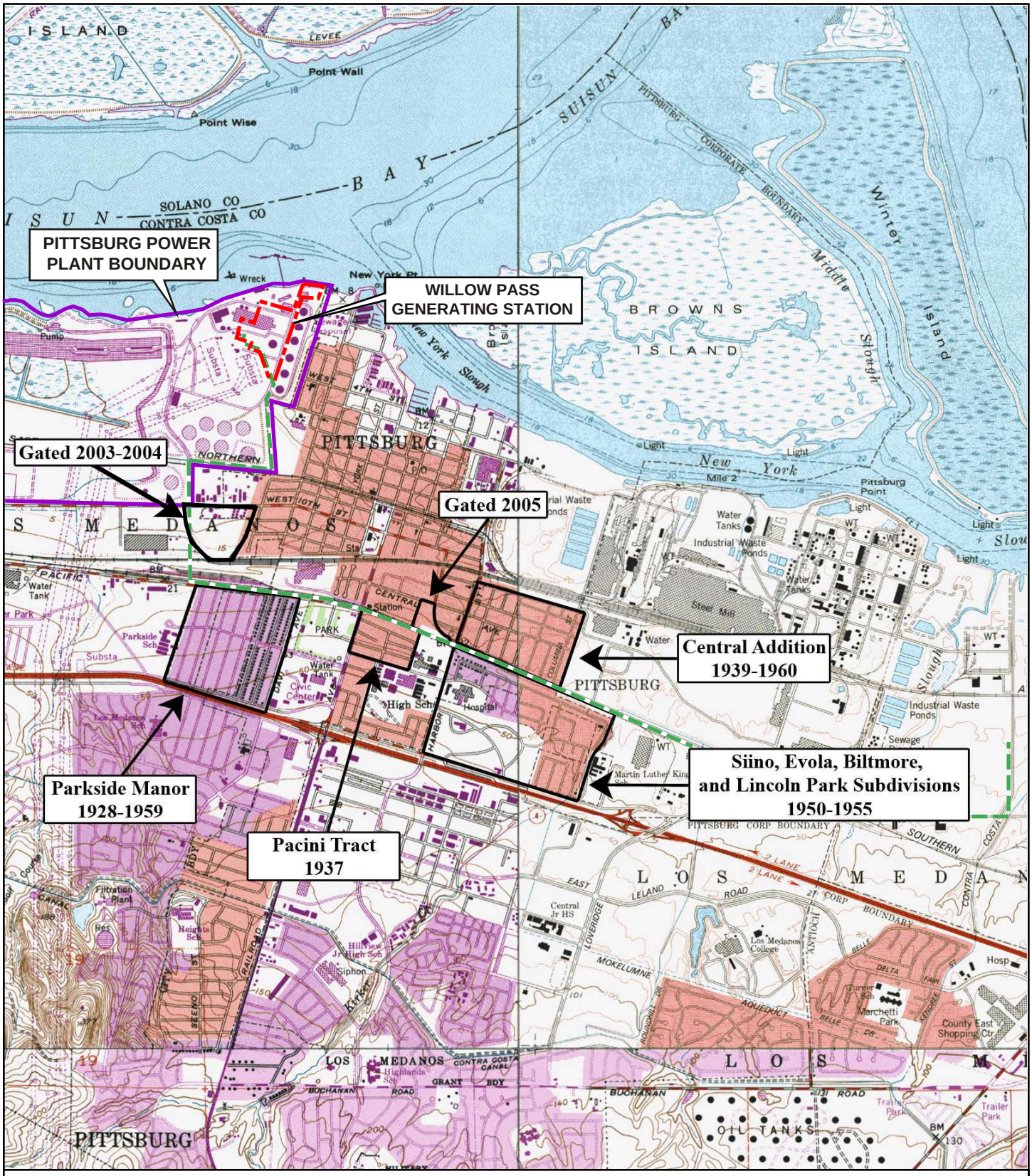
June 2008
28067343

Willow Pass Generating Station
Mirant Willow Pass, LLC
Pittsburg, California

URS

FIGURE 3

6/19/08 vsa ..T:\Mirant Pittsburg-Willow Pass\Graphics\7.03 Cultural\Fig 3_AppL-HA_Hist APE.cdr



LEGEND

Approximate linear route

Sources:

JRP HistoricalConsulting,LLC, May 2008

USGS Topographic Maps, 7.5 Minute Series: Honker Bay, CA (Rev. 1980) and Antioch North, CA (1978)

N

0 2000

Approximate Scale in Feet

RESIDENTIAL SUBDIVISIONS ADJACENT TO THE PROPOSED LINEAR PIPELINE

Willow Pass Generating Station
Mirant Willow Pass, LLC
Pittsburg, California

June 2008
28067343

URS

FIGURE 4

6/24/08 vsa ..\T:\Mirant Pittsburg-Willow Pass\Graphics\7.03 Cultural\Fig 4_AppL_HA-resid.ai

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 or # Pittsburg Power Plant

P1. Other Identifier: Pittsburg Power Plant

*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 photorevised 1980 T2N; R 1E; ___ ¼ of Sec 7; MD B.M.

c. Address 696 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 085-010-014, 085-010-015; 096-100-026

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Pittsburg Power Plant is located on the western edge of Pittsburg California. The plant is on 320 acres at the southern edge of Suisun Bay west of the outlet of the San Joaquin River. The parcels contain a seven-unit steam power plant, associated abandoned oil tanks, a switchyard and substation, two cooling towers on a canal, and a variety of supporting structures and buildings. Units 1-4 were shut down in 2003, the remaining units (Units 5-7) produce 1,311 megawatts of power.

The largest structures at the site are Units 1-6 (Photograph 1). Units 1-4 are identical with 153 foot tall boilers and 200 foot tall stacks. The four stacks are located on the north side of the buildings and adjoin the boilers which are surrounded by permanent metal scaffolding. The top three stories of scaffolding are enclosed with a panel system. On the south side, metal scaffolding surrounds the steam pipes between the boilers and the turbine deck (Photograph 2). The connection between the boilers and the turbine deck is enclosed. Four generators, one for each boiler, are located on the deck with metal covers. Turbines and steam regulating equipment are beneath the cast concrete deck (see Continuation Sheet).

*P3b. Resource Attributes: (List attributes and codes) (HP9) Public Utility Building

*P4. Resources Present: ☒ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) Camera facing northwest, November 29, 2007

*P6. Date Constructed/Age and Sources:
☒ Historic ☐ Prehistoric ☐ Both
Units 1-4 (1951-1954); Unit 5 (1960)
Unit 6 (1961); Unit 7 (1972)

*P7. Owner and Address:
Mirant California
3201 Wilbur Ave
Antioch, CA 94509

*P8. Recorded by: (Name, affiliation, address)
Cheryl Brookshear / Meta Bunse
JRP Historical Consulting, LLC
1490 Drew Ave, Suite 110
Davis, CA 95618

*P9. Date Recorded:
November 29, 2007

*P10. Survey Type: (Describe)
Intensive

*P11. Report Citation: JRP Historical Consulting, LLC "Historic Resources Inventory and Evaluation Report for the Willow Pass Generation Station Project," 2008.

*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: Pittsburg Power Plant
B2. Common Name: Pittsburg Power Plant
B3. Original Use: Power Plant B4. Present Use: Power Plant
***B5. Architectural Style:** Utilitarian
***B6. Construction History:** (Construction date, alteration, and date of alterations) Units 1-4 (1951-1954); Unit 5 (1960), Unit 6 (1961), Unit 7 (1972)
***B7. Moved?** ☒ No ☐ Yes ☐ Unknown Date: Original Location:
***B8. Related Features:**

B9. Architect: Bechtel Corp. b. Builder: Bechtel Corp.
***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 Pittsburg Power Plant does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR) because it does not have historical significance. The power plant is not significant for its association with the development of electrical generation or steam power generation at a local state or national level (Criterion A or 1). The plant does not have direct important associations with a historically significant individual (Criterion B or 2), nor does it embody characteristics of period, type or method of construction (Criterion C or 3). The facility is not a source of important information about the construction methods or technologies (Criterion D or 4). This property has 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 be a historical resource for the purposes of CEQA. (See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:** Mirant Delta LLC. "Contra Costa and Pittsburg Power Plants Entrainment and Impingement Monitoring Plan for IEP." August 2006; PG&E. "Pittsburg Power Generation Plant." October 1998; PG&E. *Plant Data Units 1-4.* PG&E Record 631440. Pittsburg Power Plant, files, no date; PG&E. *Plant Data Units 5 and 6.* PG&E Record 044099. Pittsburg Power Plant, files, no date; PG&E. *Plant Data Unit 7.* PG&E Record 052502. Pittsburg Power Plant, files, 1971. (See footnotes for additional sources)

B13. Remarks:

***B14. Evaluator:** Cheryl Brookshear

***Date of Evaluation:** May 2008

(This space reserved for official comments.)

(Sketch Map with north arrow required.)

See continuation sheet.

P3a. Description (continued):

An 100-ton gantry crane for servicing the generators runs on tracks located along the northern and southern edge of the turbine deck. Units 5 and 6 adjoin Units 1-4 on the west. Units 5 and 6 are aligned similarly with the cast concrete stacks located on the north and the generator deck on the south. The boilers for Units 5 and 6 are 189 feet tall. None of the surrounding scaffolding is enclosed. The 450-foot tall stacks are connected to the boiler through rectangular concrete covered ductwork on each side of the stack. On the south side the section between the boiler and generator deck is not enclosed. Two enclosed sections are located between Unit 4 and 5. One section is brick and may have originally been associated with Units 1-4 the other section is concrete and is most likely associated with Units 5 and 6. The turbine deck for Units 5 and 6 is at the same level as that for Units 1-4. Units 5 and 6 have two generators for each boiler. The service crane serves all eight generators, but an open portion separates the deck between the two sets of generators. The generators for Units 5 and 6 are longer than those for Units 1-4.

At the east end of Units 1-6 are the administrative offices, shop and warehouse (Photograph 3). The three rectangular components are set at right angles to each other. The office runs along the same axis as the generating units. The office portion is three stories tall with brick veneer. Ribbon windows are located on the second and third floor north and south sides. The door is recessed on the south side where the office joins the shop building. The shop is connected to the office at right angles and is also faced with brick. The shop is only two stories tall and has no windows. A pre-fabricated addition is located to the west and has an overhead garage door. The warehouse is set at a right angle to the office on the north side. The warehouse is also brick veneered. It is only one story tall and has two overhead garage doors on the west side. The entire office, shop and warehouse complex has a flat roof.

Unit 7 is west of Units 1-6 and is set at a slight angle from the other units. Unit 7 is the largest unit at the site and discontinuous from the other units (Photograph 4). The cast concrete, 450-foot tall stack is located on the southeast side and connected to the boiler by a cylindrical metal duct. Metal scaffolding surrounds the boiler with a concrete support structure on the west side complete with elevator (Photograph 5). The boiler is covered with a gable roof protecting the top two stories of the boiler. The generator deck is 49 feet above grade. A hundred ton gantry crane for maintenance is located above the deck on rails. A gable roofed shed is on the deck with an overhead garage door located on the east side.

Numerous support buildings and structures surround the generating units. The discussion of these buildings will begin on the east side of the plant site and work around the site in a counterclockwise direction.

Tanks 1-6 are set along the eastern edge of the plant and Tank 7 is set in to the west midway between tank 3 and 4 (Reference #1). A concrete wall surrounds each of the tanks (Photograph 6). Tanks 1-6 are constructed of concrete slabs wrapped with pre-tensioned wire and coated with gunite. Tank 7 is steel. All the tanks are covered with a ridged vinyl siding with metal trim. Metal sectional pipe connects the tanks to the plant. The pipes are covered with an insulation material most of which has been replaced as a part of an asbestos abatement program.

The parking area (Reference #2) consists of three covered aisles (Photograph 7). The covers have a metal frame with metal supports spaced evenly along the length. The shed roof is grooved metal. Additional parking structures are located throughout the facility.

North of the parking area is an auditorium (Reference #3) (Photograph 8). The auditorium is a one story modular building of 12 units. The building is raised with a low skirting of faux vertical siding. The entire building is sided with faux vertical plank siding made of plywood. The building has a low, end gable roof. A decorative blue band runs along the top edge of the building. Metal sliding windows are spaced evenly around the building. The east sand west ides have two doors one with a concrete ramp and the other with a six-stair stoop. Ventilation units are spaced evenly at ground level around the building.

An electrical equipment building (Reference #4) is north of the auditorium. The building is one story tall with a flat roof (Photograph 9). It is constructed of cast tilt up sections on a concrete foundation. Two ribbon windows with operating awning transoms are located near the top of the building. A metal fire door is located on the south side. A double equipment door is located on the east side. Electrical equipment is attached to the building on the north.

West of the electrical equipment building is a training building (Reference #5). The training building is a one story irregular modular building with a flat roof (Photograph 10). The modular building consists of four full-length modules and a shorter one attached to the west side. The building is sided with faux vertical siding. Sliding windows are spaced evenly around the building. Stairs lead to a single door on the east side and a ramp on the west side leads to a door at the end of the short module. Parking shelters are attached to the front and rear of the building.

The storage building near the retaining basins (Reference #6) is prefabricated. The oval shaped building has metal ribs with an irregular gothic arch shape (Photograph 11). Prefabricated panels fill the area between the ribs. The roof has two cylindrical ventilators.

Four retaining basins are located in the northeastern portion of the plant (References #7-10, Photograph 12). The retaining basins are concrete. One to three foot rims are above the surface. A rubberized lining covers the sides and the entire interior of the basins. One basin has a tank and array of equipment situated to the east of the basin (Reference #11, Photograph 13).

The power plant was constructed with a dock for the delivery of equipment and fuel oil (Reference #12). The dock extends into Suisun Bay and then forms a T parallel with the coastline (Photograph 14). The wooden dock is supported on wood pilings with sections of cross bracing. The deck has a rail for moving equipment. A pipeline is located on the west side of the dock just outside the handrail. A mast with cross arms is located at the end of the dock with pulleys and lines to assist with unloading.

West of the retaining basins and along the shoreline is a load center (Reference #13). The building is one story tall with an irregular plan and flat roof (Photograph 15). The building is constructed of tilt up panels on a concrete pad. A semi enclosed attachment is on the east side. The attachment has a flat roof and corrugated metal walls that leave a gap at ground level and near the roof. An overhead door is located on the south side. Electrical equipment is exposed on the southwest side.

The water treatment facility (Reference #14) is west of the retaining basins. The facility has a concrete lined containment basin with six tanks on stands. Southeast of the basin is the treatment building (Photograph 16). The tall one story low gable end building is sided with grooved siding. A tall overhead door and regular overhead door are located on the north side. Two temporary trailers are west of the building. The south side of the building has two overhead garage doors.

North of Unit 4 is the warehouse, a Butler storage building (Reference #15). The corrugated metal building has an end gable roof and shed roof additions to each side (Photograph 17). Each end of the building has two nine light awning windows just below gable height. The north end has a single personnel door the south end has a large overhead door and a personnel door. The sides have a row of nine light metal awning windows just below the eaves and some have been removed or covered by the shed roofed additions. The east side has a shed-roofed addition along the north two thirds. The grooved meal addition has two personnel doors along the side and an open bay at the north end. On the west side a shed-roofed addition runs the full length. The south side of the addition is open and access is restricted with a chain link fence. The addition is constructed of a metal frame and grooved siding.

Opposite the Butler storage building is a small storage building (Reference #16). The square building is one story tall with a low gable roof (Photograph 18). Vertical grooved siding covers the building. The north side has an overhead door. The south and west sides have personnel doors.

The circulator pump (Reference #17) is housed in a building northwest of the Butler building. The rectangular building has a nearly flat roof (Photograph 19). The building is clad in vertical grooved synthetic siding. A single metal personnel door is located on the west side of the building.

A hundred ton gantry equipment crane (Reference #18) is located above the intake pumps on the shoreline west of the dock. The crane travels on rails supported on raised concrete footings (Photograph 20). The metal bracket shaped crane lifts material from the center cross piece.

Along the northern edge is a railroad shed (Reference #19). The shed has a nearly flat roof and vertical grooved siding (Photograph 21). Behind the shed to the east are three hoppers which feed into the shed. The west side of the shed has a large overhead door. Railroad tracks lead to the door.

North of Unit 7 is a small equipment building (Reference #20). The one story building has an L plan and flat roof (Photograph 22). The west side of the L is constructed of concrete block and has two metal personnel doors on the west side and single door on the east side. The die of the L along the bay is slightly shorter and narrower. It is enclosed on three sides and has corrugated sliding panels on the south side.

At the far west end of the plant is a storage building and two cooling towers. The storage shed (Reference #21) is similar to the Butler building. The gable end corrugated metal building has sliding garage doors at the east end (Photograph 23). One small four light window is on the east end and three more are spaced along the north and south side.

The cooling towers (Reference #22 and 23) are located in a manmade oblong pond. The rectangular buildings have concrete ends (Photograph 24). Side panels slant into the building and 13 large circular vents compose the roof. Rectangular concrete pump buildings are located at the east end of each cooling tower.

Ammonia tanks (Reference #24) are west of Unit 7. Three horizontal steel tanks sit on concrete foundations. Metal ladders with surrounding safety cages lead to metal, partial decks above the tanks.

At the southwest corner of the main plant is the insulation and coatings building (Reference #26). The butler building is one story with a gable end roof (Photograph 26). The entire building is constructed of corrugated metal. The east end has an overhead door. A shed roof addition has been placed on the west end. The long sides have three nine-light awning windows each.

Several temporary buildings are located at the plant. In addition to the auditorium (Reference #3) there is a single modular building on the west side of the plant (Reference #25) and a complex of modular buildings south of Units 5 and 6 (Reference #27, Photograph 27). These modular units are the size of mobile homes or multiples thereof. All have plywood skirting which has been painted and grooved to simulate vertical siding. The same material covers the walls. Sliding windows are evenly spaced. The roofs are nearly flat.

The plant has two associated switchyards (Reference #28). The eastern switchyard supports 115kv service and the west switchyard supports 230kv service (Photograph 28). Electrical lines enter the eastern switchyard from the northeast. supported on metal structures consisting of two uprights and a beam. The uprights and beams are constructed of four corner supports reinforced by cross bracing. The wires then attach to lower cross-braced towers with insulators hanging down. From there the wires drop to transformers which are rectangular or cylindrical with insulators pointing up. Most of the exiting lines are gathered onto four sided, cross-braced towers and proceed southwest. One group of wires from the 115kv yard are gathered onto A-frame supports and proceed to the southeast. The western 230kv switchyard has a tall central spine of horizontal beams of cross-braced construction. “Ribs” at right angles are evenly spaced on both sides of the spine. Eight groupings of transformers are located on the east side, seven on the west with wire support structures above them. A newer portion to serve Unit 7 is placed at an angle at the northern end. That portion has two west ribs and one east rib. Lines are

gathered onto four sided, cross-braced towers. At the north and south end wires are gathered onto A frame supports before proceeding to towers. All the lines exit the switchyard to the southwest.

At the northern edge of the switchyard is a control building (Reference #29). The brick veneered building has an irregular plan and irregular flat roof. The concrete foundation rises above ground level and creates a one to two foot base around the building. The central portion of the building is about four feet taller than the two north and south sides. A decorative white belt band is located at the top of the central portion and also at the top of the two sides. The west end has two vents below the belt band and a double door under a cantilevered protective roof. The east end has a ribbon window of three fixed panes and projecting electrical equipment. The southern side is shorter than the central segment and has a cantilevered awning around three sides. A transmission tower is located on the roof.

The hazardous materials storage at the plant consists of three buildings. An older ad hoc building is to the west (Reference #30). The building is square with a gable roof (Photograph 30). The central portion is a plywood building with gable roof. The east end is open and secured with a chain link gate. The building is flanked on either side by cargo containers. The containers are metal with flat roofs and solid doors on the east end. Onion dome roof ventilators have been added to the cargo containers. The other two buildings are more recent (Reference #31 and 32). These identical buildings are prefabricated with low side gable roofs (Photograph 31). The buildings are constructed of vertical grooved synthetic siding. Each has three overhead garage doors on the north side. A personnel door is located on the west end. Horizontal louvered vents are spaced evenly along the bottom of the east, west and south sides of the building.

B10. Significance (continued):

Historic Context

By the time that the Pittsburg Power Plant facility opened, steam powered generation already had a long history in California. These plants had been the first electric generating facilities in California. British designer Sir Charles Parsons built the first steam turbine-generator in 1884, and almost immediately others began making improvements upon his original concept, but the earliest steam generating plants were little more than steam engines converted to drive a generator rather than a locomotive. By the beginning of the twentieth century, engineers designed steam turbines to replace the original steam engine power plants. Aegidius Elling of Norway is credited with creating the first applied method of injecting steam into the combustion chambers of a gas turbine engine in 1903-04 and within a relatively short time, the technology and capacity of these engines to supply power and electricity grew by leaps and bounds. These advance soon brought electricity to a wide range of industrial and domestic applications, however the materials needed to withstand the high temperatures of modern turbines were not available in the beginning stages of steam turbine development. Technology and improvements for steam turbine engines advanced throughout the 1920s and 1930s, leading to a generation of more efficient turbine power plants by the 1950s, when the Pittsburg Power Plant was originally designed and built. During this time, utilities also retired or replaced many of the older steam-electric plant generating units and constructed more modern units.[1]

Steam power generation was part of California's power production throughout the twentieth century, although the role of steam generation diminished considerably during the pre-World War II era when massive hydroelectric generating plants came on line throughout the state. As early as 1920, hydroelectric power accounted for 69% of all electrical power generated in California. In 1930, that figure had risen to 76%; and by 1940 hydroelectric sources provided 89% of California's electricity. Rapid construction of new thermal, or steam-powered electric generating units, however, accounted for most of the new generation capacity in the state after World War II. By 1950, hydroelectricity accounted for only 59%

[1] Heinz Termuehlen, *100 Years of Power Plant Development: Focus on Steam and Gas Turbines as Prime Movers* (New York: ASME Press, 2001), 11, 21-28; Douglas Stephen Beck and David Gordon Wilson, *Gas Turbine Regenerators* (New York: Chapman & Hall, 1996), 30; William A. Myers, *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company* (Glendale, CA: Trans-Anglo Books, 1984), 8.

of the total power generated, falling to 27% in 1960. Some new hydroelectric plants were built during the 1960s, chiefly associated with federal and state water projects, but by 1970, hydroelectric plants accounted for only 31% of all electricity generated in California.[2]

These statistics, however, tend to obscure the work of Pacific Gas & Electric Company (PG&E) and Southern California Edison (SCE), California's largest electrical utility providers, which both built large-scale steam generation plants as early as the 1920s. James Williams, a historian of energy policies and practices in California, noted that the decision by PG&E and SCE to build steam plants may be attributed to several converging trends in the mid- to late-1920s. First, a persistent drought in California caused the major utilities to begin to question the reliability of systems relying so heavily upon hydroelectricity. This drought began in 1924 and continued, on and off, for a decade. At about the same time, new power plants on the East Coast (where steam had always played a more important role than in California) achieved far greater efficiencies than had previously been possible. Between 1900 and 1930, for example, the fuel efficiency of steam plants, measured in kilowatts per barrel of oil, increased more than nine-fold. In addition, new natural gas lines were completed which could bring new supplies to both Northern and Southern California in the late 1920s, tapping large reserves in the San Joaquin Valley. Natural gas has played an important role in steam electric power generation in California since that time.[3]

The confluence of these various factors – a drought, new steam generator technologies, and new supplies of natural gas – induced PG&E, SCE, and other utilities to begin construction of large steam plants during the late 1920s and early 1930s. In 1929, the Great Western Power Company (absorbed by PG&E in 1930) built a large steam plant on San Francisco Bay, near the Hunters Point shipyard, fitted with two 55 MW generators.[4] PG&E also built a steam plant in Oakland in 1928, called Station C, and a few years later a PG&E vice-president for engineering wrote: "under the circumstances which now prevail, it is natural to question the future of hydro in California."[5]

But it was in response to the demands of post-World War II growth in California that PG&E built new steam generation plants throughout the state. Wartime increases in population continued after the end of hostilities and general statewide economic expansion spurred rapid growth in the residential, commercial, and industrial sectors. The need to generate power was imperative and PG&E expanded their systems along with the rest of California's energy industry. Between 1946 and 1953 PG&E invested $1 billion in infrastructure and generating facilities. Because most of the more favorable hydroelectric sites in California had already been developed, and the cost of steam generating facilities had been reduced by technological developments in design and abundant natural gas resources, steam plants became the more favorable option. Steam turbine power plants were cheaper and quicker to build than hydroelectric plants and utility companies moved away from hydroelectricity during this period -- steam turbines became the generator of choice. Such plants conserved water and kept costs down for the business and the consumer.[6]

PG&E steam generation plants built during the postwar period relied upon proven technologies and were assembled quickly and inexpensively relative to earlier plants. In a detailed article in 1950 in *Civil Engineering*, PG&E Chief Engineer I. C. Steele summarized the design criteria that went into construction of four major steam plants the company had under construction at that time, at Moss Landing, Contra Costa, Kern, and Hunters Point in San Francisco. These plants had much

---

[2] James C. Williams, *Energy and the Making of Modern California* (Akron, Ohio: University of Akron Press, 1997), 374.

[3] Williams, *Energy and the Making of Modern California*, 278; Charles M. Coleman, *PG&E of California: The Centennial Story of Pacific Gas and Electric Company* (New York: McGraw-Hill, 1952), 306.

[4] This plant still exists. It was fitted with new units in 1948, at the same time that the Kern Power Plant was being constructed (Coleman, *PG&E of California*, 298).

[5] "1928 Steam Plants Account for 45 Percent of New Generating Capacity," *Electrical West* (February 2, 1929):. 80-81; R.W. Spencer, "Cooling Water For Steam Electric Stations in Tidewater, "*Transactions of the American Society of Civil Engineers* 126 (1961): 294, 300; Williams, *Energy and the Making of Modern California*, 279.

[6] Myers, *Iron Men and Copper Wires*, 200; Williams, *Energy and the Making of Modern California*, 277-78, 282-83; Charles M. Coleman, *PG&E of California*, 331.

in common with each other and with other steam plants under construction in the state. The site selection criteria were the same in all cases: close to load centers to reduce transmission costs; accessibility to fuel supplies; near a water supply; in a location where land was inexpensive; and on land that could provide a good foundation. By the mid 1950s, Walter Dickey, an engineer from Bechtel, touted recent design innovations that improved the economics of steam plant construction even more. These plants, he argued, could be built economically by minimizing the structural material, chiefly by creating semi-outdoor turbo-generator units. Furthermore, virtually all of these plants were designed to be expanded if market conditions warranted, and most of them were.[7]

The decades between 1950 and 1970 were the years of peak expansion of steam generating capacity for PG&E, SCE, and other utility companies. PG&E operated 15 steam electric plants in California in 1950, and during the following decade added several new plants and expanded older ones. Chief among these were the Kern plant (1948-50), Contra Costa (1951-53), Moss Landing (1950-52), Pittsburg (1953-54), Morro Bay (1955), Hunters Point (addition 1958), and Humboldt Bay (1956-58). The Pittsburg plant was at the time of its construction the largest steam station in the west, with a capacity of over 680 Mw when the first four units were complete.[8] By the late 1970s, there were more than twenty fossil fuel thermal plants in California owned by various power companies and clustered around San Francisco Bay, the greater Los Angeles area, and in San Diego County, along with a few interior plants in San Bernardino County and Riverside and Imperial Counties, and a few on the Central Coast.[9]

Most of the oil- or gas-fired steam plants currently in use in California were installed in the period from about 1950 through 1970. After 1970, the major utilities began to look for alternative energy sources, ranging from nuclear power to wind, geothermal, and other "green" energy sources, other than traditional thermal or hydroelectric systems. Despite these efforts, however, fossil fuel steam generation remains the backbone of electrical generating capacity in California and there are currently 34 steam turbine power plants in California of a variety of ages and locations.[10]

Pittsburg Power Plant was constructed in 1951-1954 as a part of the rapid expansion of electrical generation following World War II. PG&E purchased the land in 1951 only miles away from the Contra Costa Power Plant which had just been completed. The site met the requirements for a good power plant site; near a growing load, access to water and fuel, and cost effective. PG&E hired Bechtel Corporation to engineer and construct the $80 million plant.[11] The Pittsburg Power Plant had several similarities with other plants PG&E was constructing as a part of its $1 billion expansion. The plant had four generating units, and had off shore docks (Reference #12) for the delivery of fuel oil similar to the plans for Contra

[7] I. C. Steele, "Steam Power Gains on Hydro in California," *Civil Engineering* (January 1950): 17-21; Edgar J. Garbarini, "Design Saves Construction Dollars on Contra Costa Power Plant," *Civil Engineering* (May 1953): 31-33; Walter L. Dickey, "The Design of Two Steam Electric Plants," *ASCE Transactions* (1956): 253-273.

[8] At its height Pittsburg Power Plant generated 2,080 Mw, units 5 and 6 generated 660Mw, unit 7 740 Mw, leaving 680Mw to be generated from units 1-4. Mirant Delta LLC, "Contra Costa and Pittsburg Power Plants Entrainment and Impingement Monitoring Plan for IEP" (August 2006) 2-12.

[9] Annual Reports of the Southern California Edison Company, various years; Spencer, "Cooling Water For Steam Electric Stations in Tidewater," 280-302; Steele, "Steam Power Gains on Hydro in California," 17-19; Dickey, "The Design of Two Steam Electric Plants," 253-255; "Haynes Steam Plant Will Grow With Demand," *Southwest Builder and Contractor* (October 12, 1962): 24-27; Williams, *Energy and the Making of Modern California*, 257.

[10] The California Energy Commission retains figures on the fuel type for all electricity used in the state, even if the power is generated out of state. In 1999, natural gas-fired generators were responsible for 31% of all electricity used in the state, compared with 20% for hydroelectricity. Coal-fired steam plants, all of them out of state, accounted for 20% of the total. "Green" sources accounted for 12%. The percentage of in-state natural gas-fired steam electricity is much larger than 31%, since all of the coal and much of the hydroelectric power is generated out of state. See www.energy.ca.gov/electricity/system_power.

[11] "News," *Southwest Builder and Contractor*, (October 5, 1951) 18.

Costa and Moss Landing.[12] Pittsburg Power Plant continued the trend of increasing generating capacities, utilizing four 125,000kw General Electric generators to produce over 100,000kw more than the Contra Costa plant's four generators.[13] The generators were powered by steam turbines supplied by boilers which burned oil, but had back up natural gas capability.[14] The semi-outdoor plan was new to PG&E, but had previously been used in southern California by Southern California Edison at its Etiwanda Steam Station which was constructed between 1951 and 1953.[15] In the semi-outdoor plan, eliminating the housing around the turbines and generators reduced costs. For the Pittsburg Power Plant and Contra Costa plant PG&E engineer recorded the application of several techniques used on other buildings. To improve seismic performance the walls of the warehouse and shop were constructed with brick or tile facing with reinforced grout between the two faces. Experiments on the 18-foot diameter and 200-foot tall stacks were performed to prevent wind damage. The Pittsburg Power Plant also utilized a different construction method for the fuel oil storage tanks. The tanks were constructed with concrete slabs, wrapped in pre-tensioned wire before being coated in protective gunite.[16] The plant was designed to support both local and system wide load. Local transmission of power generated by Units 1 and 2 was handled by a 115kv switchyard and system transmission of power generated by Units 3 and 4 by a 230kv switchyard (Reference #28). The switchyards had their own control building (Reference #29) at the northern edge of the yard.[17] In addition to the four generating units, waterside crane (Reference #18), six oil tanks, and oil-loading dock (Reference #12), the plant had a brick administration building and retention basin (Reference #10). During planning and construction the administration building was reconfigured to its current T shape from a linear building at right angles to the plant itself.[18]

The continued growth of electrical use resulted in the addition of Units 5 and 6 in 1960 and 1961. The units added 660 Mw of power nearly doubling the plant's capacity.[19] The new units, while larger than the previous utilized the same architecture and are aligned with the previous units. Babcok and Wilcox designed the boilers with PG&E in house engineers designing the rest of the units. The boilers were larger with a height of 189 feet compared to 153 feet for Units 1-4. The larger boilers were able to provide enough steam that the turbines could power two generators each. Unit 5 utilized a Westinghouse turbine and two Westinghouse generators. Unit 6 utilized General Electric equipment with the same output. Units 5 and 6 were designed to share equipment with Units 1-4. The generator deck was placed at the same height so all six generators could use the same 60 ton gantry crane. Additional pumps were added to the water intake so the units could share the existing water supply system. One bay was added to the western 230kv switchyard and four bays were added to the 115kv switchyard. The major difference between Units 5 and 6 and the preexisting Units 1-4, is that Units 5 and 6 were designed to use natural gas as their primary fuel and oil as a back up supply.[20]

In 1972 Unit 7 was brought online. The new unit was much larger than the previous six and was not aligned with the other units. Unit 7 produces 740 Mw of electricity. The unit was designed separately from Units 1-6 and shares few facilities with them. However, the layout allowed for a potential Unit 8 adjoining Unit 7. The manufacturers provided the designs for

---

[12] Coleman, *PG&E of California*, 334. Moss Landing utilized an offshore pumping platform to unload tankers delivering oil. A submarine pipeline connected the on-shore tanks with the platform.

[13] Williams, *Energy and the Making of Modern California*, 323; PG&E, *Plant Data Units 1-4*, 1-2; Walter L. Dickey, "The Design of Two Steam Electric Plants," *ASCE Transactions* (Volume 121, 1956) 255.

[14] PG&E, *Plant Data Units 1-4*, 1-5.

[15] Southern California Edison Company, *Etiwanda Steam Station*, (1954) 2-3,5&14.

[16] Walter L. Dickey, "The Design of Two Steam Electric Plants" *ASCE Transactions* (Volume 121, 1956) 263, 266, 271.

[17] Walter L. Dickey, "The Design of Two Steam Electric Plants" *ASCE Transactions* (Volume 121, 1956) 255; PG&E, *Plant Data Units 1-4*, PG&E Record # 631440, no date, on file at Pittsburg Power Plant, 1-1; 1959 Aerial Photograph historicaerials.com accessed May 12, 2008.

[18] Coleman, *PG&E of California*, Architect's rendering between 326 & 327; compare to rendering in Walter L. Dickey, "The Design of Two Steam Electric Plants," *ASCE Transactions* (Volume 121, 1956) 254.

[19] Mirant Delta LLC, "Contra Costa and Pittsburg Power Plants Entrainment and Impingement Monitoring Plan for IEP" (August 2006) 2-12.

[20] PG&E, *Plant Data Units 5 and 6*, PG&E Record # 044099, 1960, on file at Pittsburg Power Plant, n.p.

the major components, the boiler and turbine-generator structure. Combustion Engineering Inc., who built the boiler, designed the onsite boiler support and built it. Westinghouse designed the turbine and generator, the turbine pad and generator deck surrounding them were built to specifications provided by Westinghouse. Like Units 5 and 6, Unit 7 was designed to use natural gas as its primary fuel with the option to use oil if necessary. The unit added to existing infrastructure. Tank 7 west of the six existing tanks was provided by Pittsburg-Des Moines Steel Company and unlike the others is constructed of steel and not concrete slab. The switchyard (Reference #28) was expanded to add two additional 230kv lines to Sobrante supplied by Unit 7. Unit 7 is a closed cycle system which reutilizes cooling water. The different water usage for Unit 7 required new infrastructure including two retaining basins for make up water, water treatment facilities (Reference #14), ammonia tanks (Reference #24) for the condenser equipment, and cooling towers (Reference #22 and #23) and canal.[21]

Not directly associated with the construction of Unit 7, but within the period from 1968 to 1979 several structures and buildings were added to the plant. Additional tanks were added south of the plant and the warehouse (Reference #15), rail car shed (Reference #19), load center (Reference #13), storage shed (Reference #21), insulating and coatings shop (Reference #26), were all constructed. The first building of the center complex (Reference #27) and the first hazardous materials (Reference #30) section were laid out.[22] While all units were completed in 1972 and operating the plant continued to grow. Between 1979 and 1987 covered parking (Reference #2) was added to the plant between the administrative building and the storage tanks. A small retaining pond (Reference #8) was added and the western hazardous materials building (Reference #31) was constructed. East of Unit 5 and 6, PG&E added the small storage building (Reference #16) and circulator pump buildings (Reference #17). The hazardous materials buildings were complete in 1993 with the second (Reference #32) added to the east. The auditorium (Reference #3) and training facilities (Reference #5) along with the oblong storage (Reference #6) necessitated the relocation of several parking covers to the west of Tank 7. The warehouse was expanded. In 1998 as a part of the restructuring of power regulation, PG&E sold Pittsburg Power Plant to Mirant.[23] Between 2002 and 2005, the electrical equipment building (Reference #4) was added and the load center (Reference #13) was rebuilt in its current configuration replacing a similar structure at that location. Units 1-4 were removed from service in 2003.

Evaluation

Units 1-6 and their associated buildings of the Pittsburg Power Plant are not significant to the development of electrical generation or steam power plants (Criterion A or 1). Pittsburg Power Plant was one of several power plants built to supply the growing post World War II demand for electricity. Companies though out California including PG&E, Southern California Edison, and San Diego Gas and Electric were all building plants at this time to meet the need. At this time California electrical companies decided to build steam power plants because of the lack of economical hydroelectric sites and the increased availability of oil and gas. These plants were built within a short period of time and with standardized plants. Pittsburg Power Plant is neither the first nor the last of the plants built by PG&E, which include Kern (1948), Hunter's Point (1948), Moss Landing (1951), Contra Costa (1951), Morro Bay (1955), and Humbolt Bay (1956).[24] Together these plants and associated substations supplied the power needed by PG&E, and no single plant can be logically singled out as significant within the system. Each was important to the community it served, providing power for the increasing demands of new technology and development. In the context of the time and other community services, Pittsburg Power Plant does not suggest any unique significance.

---

[21] PG&E, *Plant Data Unit 7*, PG&E Record #052502, August 1971, on file at Pittsburg Power Plant, 1-1, 1-2, 1-7, 2-4, 10-1, 16-2, 21-2.

[22] Comparison of aerial photographs 1968 and 1979, historicaerials.com accessed May 13, 2008.

[23] PG&E, "Pittsburg Power Generation Plant," October 1998.

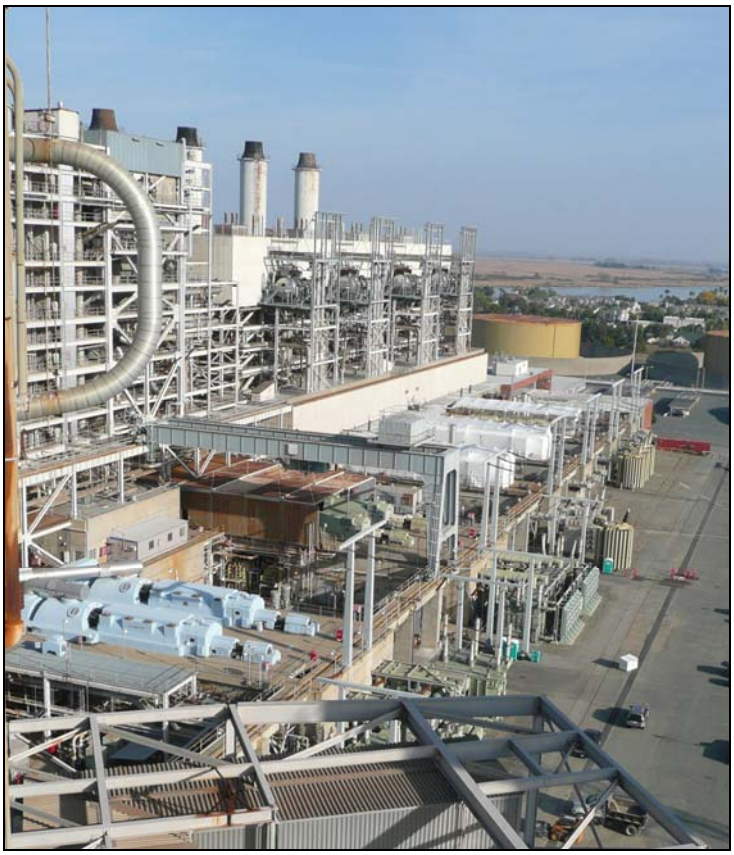
[24] CEC, California Power Plant Database, 2007, available online http://www.energy.ca.gov/database/index.html#powerplants accessed May 21, 2008.

These buildings are also not significant for their design of construction (Criterion C or 3). As mentioned above, Pittsburg Power Plant was constructed during a period of rapid growth of steam power plants. While the construction of Pittsburg Power Plant was covered in engineering journals along with Contra Costa power plant, the articles discussed the application of previous engineering developments to power plants and do not indicate any innovative or distinct design elements for the Pittsburg Power Plant. The plant was the first of the PG&E plants to have both exposed turbine-generator bays and boilers, in the "outdoor" mode, which became common in southern California in this time period. The lack of cladding allowed the plants to be built faster and more economically, but did not affect their operations. Large companies that produced major equipment for plants across the country provided the boiler, turbines and generators. No new equipment was introduced to the design. The switchyard is also constructed of standard equipment and in a typical plan.

Pittsburg Power Plant does not appear to be associated with the life of historically significant person (Criterion B and 2), nor is it significant under Criterion D and 4, as a potential source of data on human history. This property is well documented through company records and construction documents and does not appear to be a principal source of important information. The plant has had continual development, yet as a whole it retains integrity of location, design, setting, materials workmanship, feeling and association.

Unit 7 and its associated buildings are not yet fifty years old and have not achieved exceptional significance. Unit 7 is a common and necessary piece of infrastructure, but has not made an exceptional contribution to events within the past fifty years.

Photographs (cont):



Photograph 2: Oblique view of south side of Units 1-6, camera facing east from boiler structure of Unit 7.

Photograph 3: Administrative offices, shop and warehouse, camera facing northwest.

Photographs (cont):

Photograph 4: Unit 7, camera facing northwest.

Photograph 5: Unit 7, camera facing east.

Photographs (cont):

Photograph 6: Tanks 1-3 (Reference #1), camera facing north.

Photograph 7: Covered Parking (Reference #2), camera facing northwest.

Photographs (cont):

Photograph 8: Auditorium (Reference #3), camera facing northwest.

Photograph 9: Electrical equipment building (Reference #4), camera facing northwest.

Photographs (cont):

Photograph 10: Training building (Reference #5), camera facing east.

Photograph 11: Storage (Reference #6), camera facing northwest.

Photographs (cont):

Photograph 12: Retaining basin (Reference #7) camera facing northwest.

Photograph 13: Equipment associated with retaining basin (Reference #11) camera facing southeast.

Photographs (cont):

Photograph 14: Dock (Reference #12), camera facing north.

Photograph 15: Load center (Reference #13), camera facing northwest.

Photographs (cont):

Photograph 16: Water treatment facility (Reference #14), camera facing southwest.

Photograph 17: Warehouse (Reference #15), camera facing northwest.

Photographs (cont):

Photograph 18: Small storage building (Reference #16), camera facing southwest.

Photograph 19: Circulator Pump (Reference #17) camera facing northeast.

Photographs (cont):

Photograph 20: Equipment crane (Reference #18), camera facing northeast.

Photograph 21: Railroad shed (Reference #19), camera facing north.

Photographs (cont):

Photograph 22: Equipment building (Reference #20), camera facing northwest.

Photograph 23: Storage shed (Reference #21), camera facing west.

Photographs (cont):

Photograph 24: Oblique photograph of cooling towers (Reference #22 and 23) taken from Unit 7, camera facing west.

Photograph 25: Ammonia tanks (Reference #24), camera facing southwest.

Photographs (cont):

Building 26: Insulation and coatings (Reference #26), camera facing southwest.

Building 27: Complex of temporary buildings (Reference #27), camera facing southeast.

Photographs (cont):

Photograph 28: Switchyard (Reference #28), camera facing south.

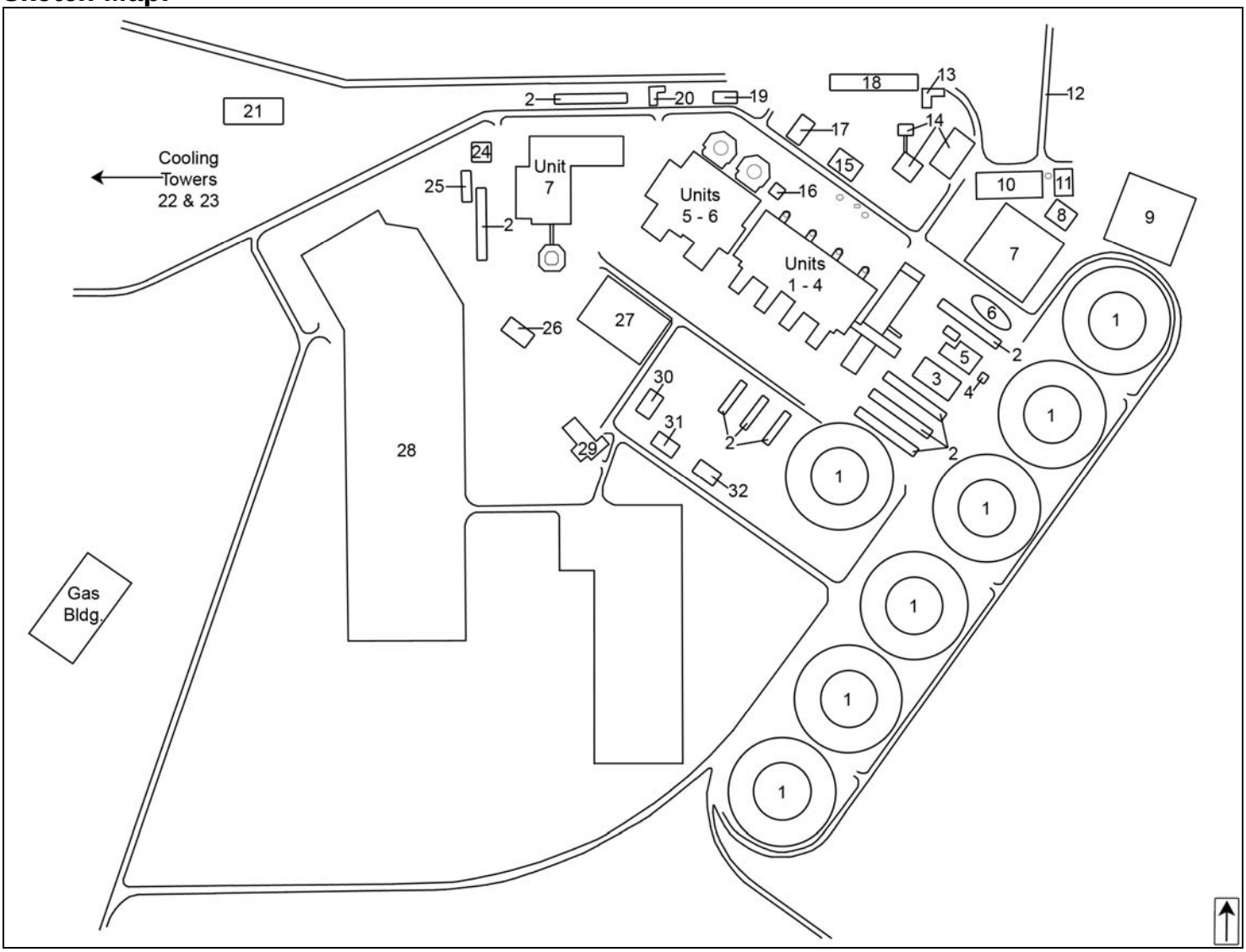
Photograph 29: Switchyard control building (Reference #29), camera facing south.

Photographs (cont):

Photograph 30: Hazardous Materials (Reference #30), camera facing northwest.

Photograph 31. Hazardous Materials storage (Reference #31 and 32), camera facing southeast.

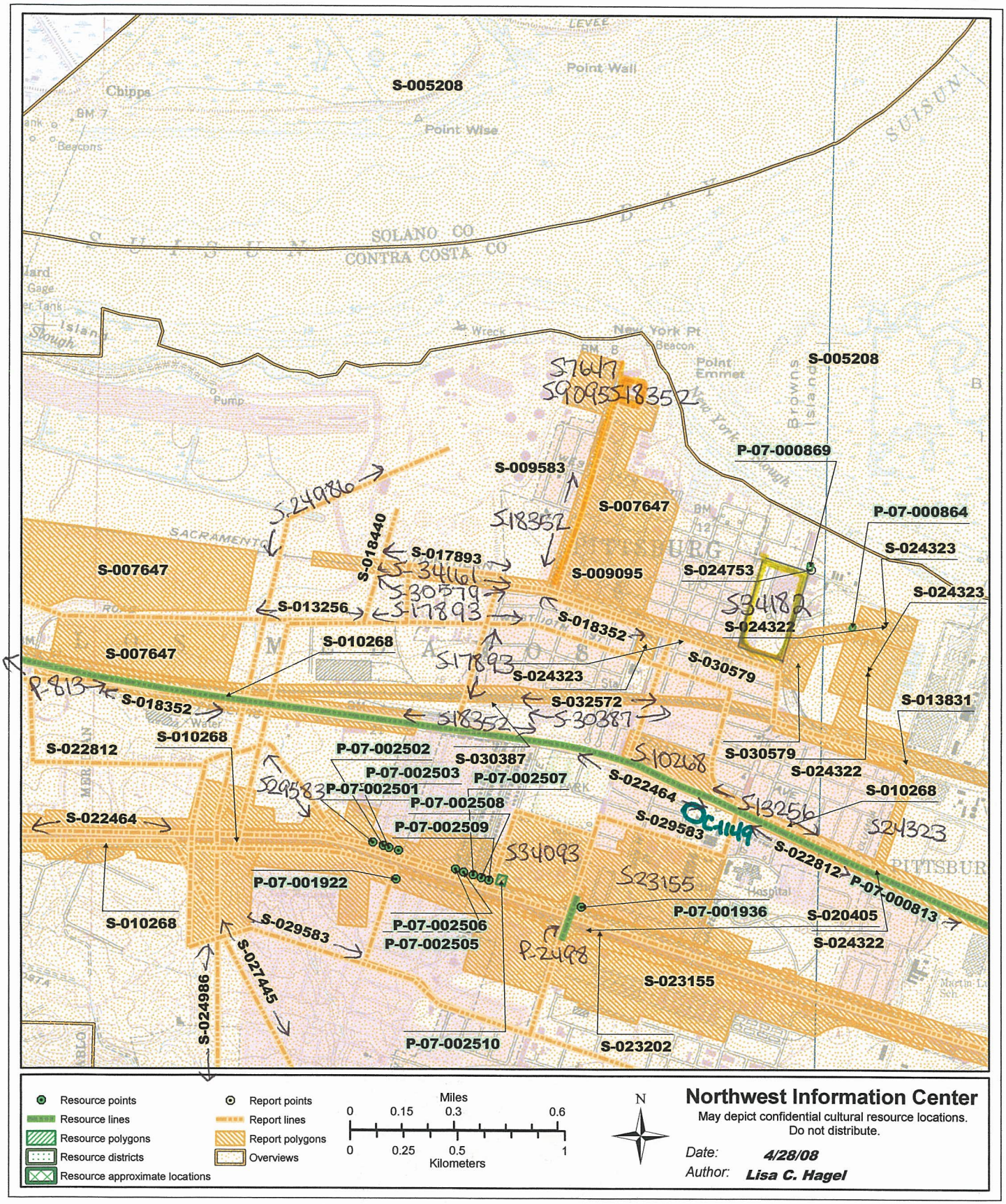
Sketch Map:


Cooling Towers 22 & 23
Unit 7
Units 5 - 6
Units 1 - 4
Gas Bldg.
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
24
25
26
27
28
29
30
31
32

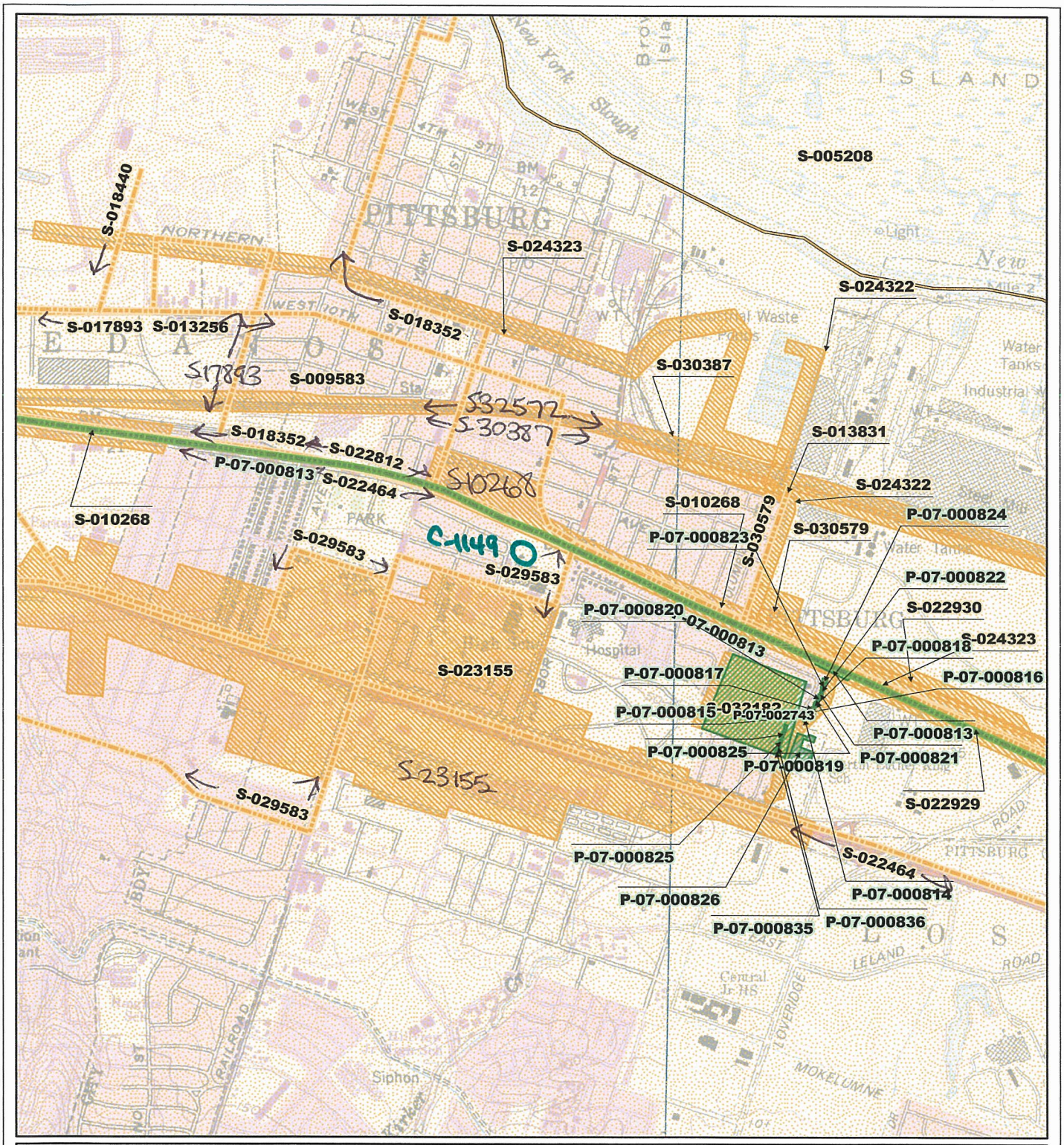
Appendix C:

Literature Search Results

Record Search: ***07-1526, Willow Pass Generating Station***



Record Search: ***07-1526, Willow Pass Generating Station***



Resource points
Resource lines
Resource polygons
Resource districts
Resource approximate locations
Report points
Report lines
Report polygons
Overviews

Miles: 0, 0.125, 0.25, 0.5
Kilometers: 0, 0.2, 0.4, 0.8

N

Northwest Information Center

May depict confidential cultural resource locations.
Do not distribute.

Date: ***4/28/08***

Author: ***Lisa C. Hagel***

Record Search: ***07-1526, Willow Pass Generating Station***

Resource points
Resource lines
Resource polygons
Resource districts
Resource approximate locations
Report points
Report lines
Report polygons
Overviews

Miles: 0, 0.125, 0.25, 0.5
Kilometers: 0, 0.2, 0.4, 0.8

N

Northwest Information Center

May depict confidential cultural resource locations.
Do not distribute.

Date: ***4/28/08***

Author: ***Lisa C. Hagel***

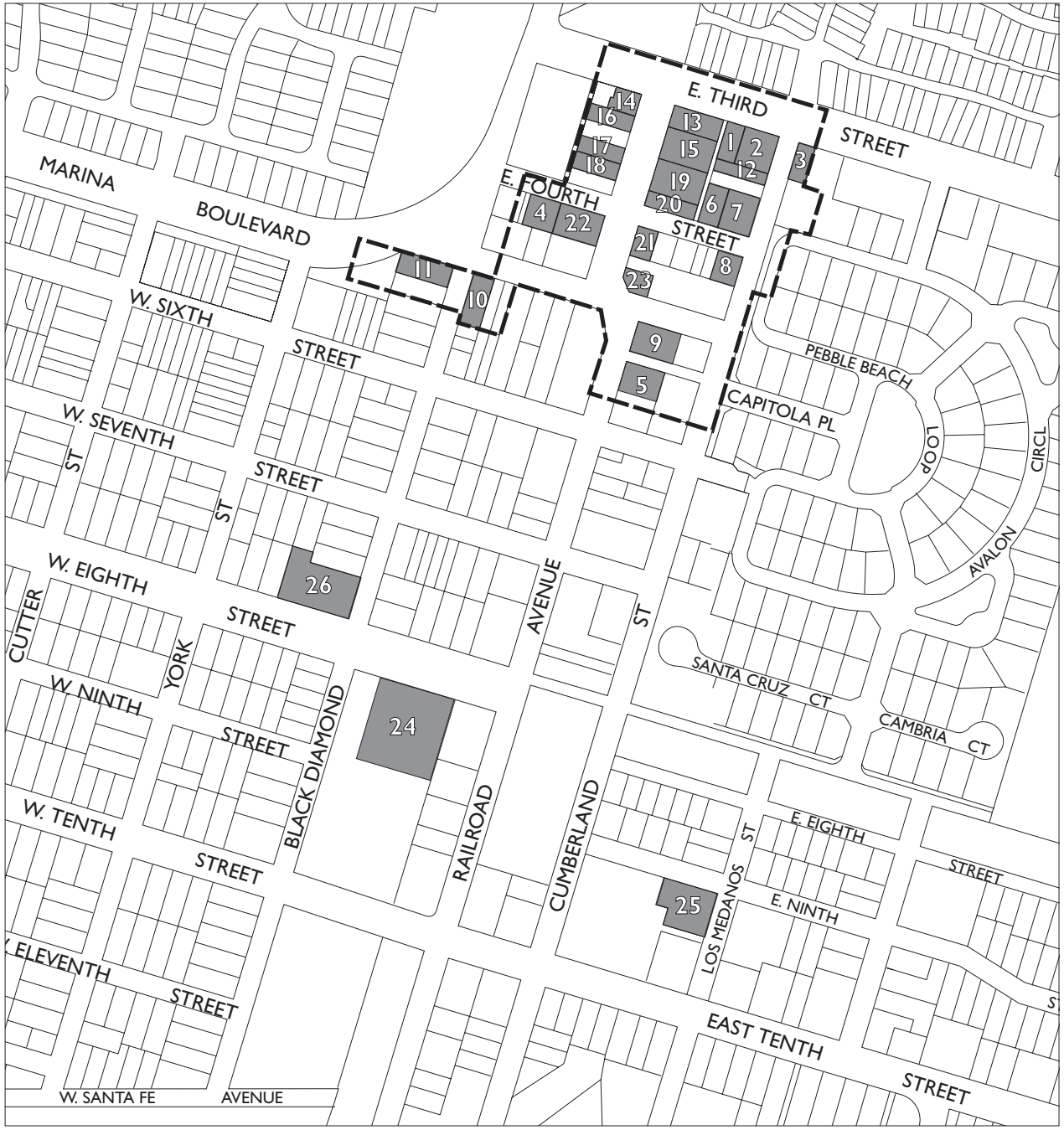
Table 9-2
Pittsburg Historical Resources

#	*Location*	*Name*	*Date Constructed*	*National Register Status*	*Building Condition*
	E. Third St.	New York Landing Historical District		Eligible for Separate Listing	
1	150, 160 E. Third St.	Greenberg Building	1925	Historical District Contributor	refurbished
2	190 E. Third St.	Green Building	1925	Historical District Contributor	refurbished
3	200 E. Third St.	Liberty Hotel	1925	Historical District Contributor	refurbished
4	10 E. Fourth St.	Burlessas Building	1922	Historical District Contributor	refurbished
5	515 Railroad Ave.	Post Dispatch	1924	Local Listing Only	refurbished
6	153 E. Fourth St.	King Parker Building	1929	Historical District Contributor	existing
7	163 E. Fourth St.	Montgomery Ward Building	1929	Historical District Contributor	refurbished
8	190 E. Fourth St.	Aiello Building	1923	Historical District Contributor	existing
9	501–509 Railroad Ave.	Post Office Building	1930	Local Listing Only	refurbished
10	24 E. Fifth St.	Scampini Building	1925	Historical District Contributor	existing
11	510 Black Diamond St.	Lepori Building	1924	Historical District Contributor	refurbished
12	348 Cumberland St.	Last Chance Building	1926	Historical District Contributor	refurbished
13	301 Railroad Ave.	National Building	1922	Historical District Contributor	refurbished
14	306 Railroad Ave.	Martinetti Building	1914	Historical District Contributor	refurbished
15	323 Railroad Ave.	National Dollar Store	1924	Historical District Contributor	refurbished
16	324 Railroad Ave.	Lazio Building	1924	Historical District Contributor	refurbished
17	356 Railroad Ave.	Royce Building	1914	Historical District Contributor	existing
18	368 Railroad Ave.	Demetrakopulos Building	1914	Historical District Contributor	existing
19	371 Railroad Ave.	California Theater	1920	Historical District Contributor	façade rehab only
20	395 Railroad Ave.	Sols Clothing Store	1920	Historical District Contributor	refurbished
21	415 Railroad Ave.	Contra Costa County Bank	1921	Historical District Contributor	refurbished
22	430 Railroad Ave.	Bank of America	1921	Historical District Contributor	refurbished
23	485 Railroad Ave.	Woulf & Ury Building	1926	Historical District Contributor	refurbished
24	W. Eighth St.	Black Diamond School	1914	May Become Eligible	existing

Table 9-2 (continued)
Pittsburg Historical Resources

#	*Location*	*Name*	*Date Constructed*	*National Register Status*	*Building Condition*
25	E. Ninth St.	Pittsburg 7th Day Adventist Church	1919	Appears Eligible	refurbished
26	W. Eighth St.	St. Peter Martyr Church	1925	Appears Eligible	existing
27	Black Diamond Wy.	Coulter Pine	—	Local Listing Only	
28	Buchanan Rd.	Fages Crespie Turnback Camp	1772	Local Listing Only	
29	Harbor St.	Camp Stoneman Military Chapel	1942	Local Listing Only	
30	Nortonville Rd.	Mine Shafts	1850	Local Listing Only	
31	Nortonville Rd.	Latimer Ranch & Home	1850	Local Listing Only	
32	Pittsburg-Antioch Hwy.	Pittsburg Mine Railroad	1866	Local Listing Only	
33	Railroad Ave.	Camp Stoneman Gates	1942	Local Listing Only	

Source: California Office of Historic Preservation, 1997; City of Pittsburg.



1-25 Historic Building

New York Landing District

0 1/8 1/4 MILES

Source: California Office of Historic Preservation, 1997; New York Landing Historical District

Figure 9-3

Historic Resources

Appendix L3
Cultural Resources Record Search
(Submitted Separately
Under the Rules of Confidentiality)