FINAL MITIGATED NEGATIVE DECLARATION

Pacific Rod and Gun Club Upland Soil Remedial Action Project

PLANNING DEPARTMENT
CASE NO. 2013.1220E

Preliminary MND Publication Date:	June 25, 2014
Final MND Publication Date:	October 23, 2014

SAN FRANCISCO PLANNING DEPARTMENT

Mitigated Negative Declaration

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Date:	June 25, 2014; amended on October 23, 2014 (Amendments to the PMND are shown in deletions as ~~strikethrough~~; additions as double underline)
Case No.:	**2013.1220E**
Project Title:	**Pacific Rod and Gun Club Upland Soil Remedial Action Project** **520 John Muir Drive** **San Francisco, CA 94132**
Zoning:	Public Use District Open Space Height and Bulk District
Block/Lot:	7283/4
Lot Size:	Approximately 10 acres
Project Sponsor:	San Francisco Public Utilities Commission Yin Lan Zhang – (415) 487-5201 YZhang@sfwater.org
Staff Contact:	Timothy Johnston – (415) 575-9035 Timothy.Johnston@sfgov.org

PROJECT DESCRIPTION:

The San Francisco Public Utilities Commission (SFPUC) proposes to implement the Pacific Rod and Gun Club Upland Soil Remedial Action Plan (the "project"), which would clean up soil contamination at the Pacific Rod and Gun Club (PRGC), located at 520 John Muir Drive on the southwest side of Lake Merced in San Francisco, California. Soil contamination is the result of the former use of lead shot and clay targets made with asphaltic materials at the skeet and trap shooting ranges. The SFPUC prepared the PRGC Remedial Action Plan (RAP) in response to a Cleanup Order issued by the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB). The project consists of excavation and appropriate off-site disposal of up to 46,500 cubic yards of soils containing elevated concentrations of lead and polycyclic aromatic hydrocarbons (PAHs) and backfilling of excavated areas with clean fill material.

FINDING:

This project could not have a significant effect on the environment. This finding is based upon the criteria of the Guidelines of the State Secretary for Resources, Sections 15064 (Determining Significant Effect), 15065 (Mandatory Findings of Significance), and 15070 (Decision to prepare a Negative Declaration), and the following reasons as documented in the Initial Evaluation (Initial Study) for the project, which is attached. Mitigation measures are included in this project to avoid potentially significant effects. See Initial Study Section E, Evaluation of Environmental Effects.

In the independent judgment of the Planning Department, there is no substantial evidence that the project could have a significant effect on the environment.

V. Wise for
SARAH B. JONES
Environmental Review Officer

10/24/14
Date of Issuance of Final Mitigated Negative Declaration

cc: Yin Lan Zhang, SFPUC

INITIAL STUDY

Pacific Rod and Gun Club Upland Soil Remedial Action Project
Case Number 2013.1220E

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Acronyms and Abbreviations

AADT	Annual average daily traffic
AB	Assembly Bill
ADT	Average daily traffic
amsl	above mean sea level
ARB	California Air Resources Board
BAAQMD	Bay Area Air Quality Management District
bgs	below ground surface
Blue book	Regulations for Working in San Francisco Streets
BMP	best management practice
CAA	Clean Air Act
Caltrans	California Department of Transportation
CAP	Clean Air Plan
CCA	CleanPowerSF, San Francisco's community choice aggregation program
CCAA	California Clean Air Act
CCC	California Coastal Commission
CCSF	City and County of San Francisco
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife (formerly CDFG)
CDP	Coastal development permit
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH_4	methane
CHHSL	California Human Health Screening Level
CMP	Congestion Management Plan
CNDDB	California Natural Diversity Database
CNPPA	California Native Plant Protection Act
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2E	carbon dioxide-equivalent
Corps	US Army Corps of Engineers
CRHR	California Register of Historical Resources
CWA	Clean Water Act
dBA	A-weighted decibels
DBI	Department of Building Inspection
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control

EA	Environmental Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EP	Environmental Planning (San Francisco)
ERO	Environmental Review Officer
ESA	Federal Endangered Species Act
ESHA	Environmentally Sensitive Habitat Area
EV	Electric vehicle
FAA	Federal Aviation Administration
FARR	Final Archeological Resources Report
FTA	Federal Transportation Administration
GHG	greenhouse gases
I-	Interstate Highway
in/sec	inches per second
IS	Initial Study
IS/MND	Initial Study/Mitigated Negative Declaration
IWMP	Integrated Waste Management Plan
lbs	pounds
LCP	Local coastal program
L_{dn}	day-night noise level
LEED	Leadership in Energy and Environmental Design
L_{eq}	steady-state acoustical energy level
L_{max}	maximum sound level
LOS	level-of-service
MBTA	Migratory Bird Treaty Act
MGD	Million gallons per day
mg/kg	Milligrams per kilogram
MLD	Most likely descendant
$MMTCO_2E$	million gross metric tons of carbon dioxide-equivalent
MND	Mitigated Negative Declaration
N_2O	Nitrous oxide
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NOP	Notice of Preparation
NO_2	Nitrogen dioxide
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSR	New Source Review
NWIC	Northwest Information Center

OHWM	ordinary high water mark
OPR	California Governor's Office of Planning and Research
PAHs	Polycyclic aromatic hydrocarbons
PM	Particulate matter
PM_{10}	particulate matter, less than 10 microns in diameter
$PM_{2.5}$	fine particulate matter, less than 2.5 microns in diameter
PMND	Preliminary Mitigated Negative Declaration
PPV	peak particle velocity
PRC	Public Resources Code
PRGC	Pacific Rod and Gun Club
QSD	Qualified SWPPP Developer
RAP	Remedial action plan
RCRA	Resource Conservation and Recovery Act
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
SamTrans	San Mateo County Transit District
SB	Senate Bill
SFBAAB	San Francisco Bay Area Air Basin
SFDPW	San Francisco Department of Public Works
SFMTA	San Francisco Municipal Transportation Agency
SFPUC	San Francisco Public Utilities Commission
SFRPD	San Francisco Recreation and Parks Department
SFSUCMP	San Francisco State University Campus Master Plan
SNRAMP	Significant Natural Resource Areas Management Plan
SO_2	Sulfur dioxide
SR	State Route
Standards	Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings
SVP	Society of Vertebrate Paleontology
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TMDL	Total maximum daily load
TASC	SFMTA Transportation Advisory Staff Committee
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WEAP	Worker Environmental Awareness Program
WPCP	Water Pollution Control Plant
μg/m3	micrograms per cubic meter

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INITIAL STUDY

Pacific Rod and Gun Club Upland Soil Remedial Action Project
Case Number 2013.1220E

A. PROJECT DESCRIPTION

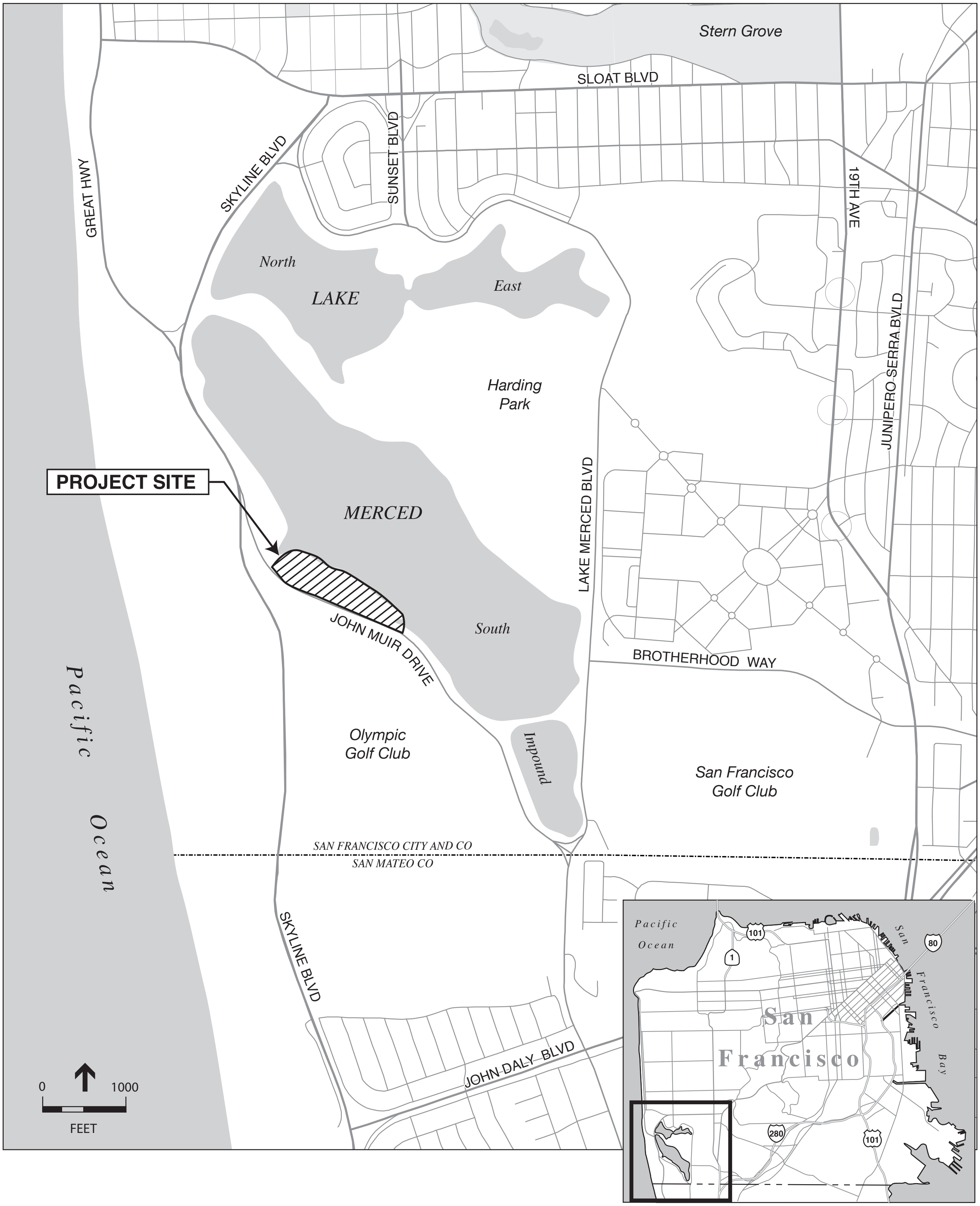
A.1 Project Location

The San Francisco Public Utilities Commission (SFPUC) proposes to implement the Pacific Rod and Gun Club Upland Soil Remedial Action Project (the project), which would remediate upland[1] soil contamination at the Pacific Rod and Gun Club (PRGC), located at 520 John Muir Drive, on the southwest side of Lake Merced, in southwestern San Francisco, California (**Figure 1**, Project Location). The nearest cross street is Skyline Boulevard to the west. The City and County of San Francisco (CCSF) owns the approximately 10-acre property, which is managed by the SFPUC. The CCSF lot and block number for the property is 7283-004.

The SFPUC leases the site to the PRGC, which built and has operated skeet and trap shooting facilities at the site since 1934. PRGC facilities consisted initially of two skeet fields and were expanded over time. Currently, there are three trap fields and six skeet fields at the site, situated on the northern portion of the property next to Lake Merced (**Figure 2**, Site Plan). Paved and gravel parking areas occupy the southern portion of the site, accessed by a driveway on John Muir Drive. There are five main buildings and three small ancillary buildings on the site. The oldest building was constructed in 1937 after the PRGC began leasing the site. All of the buildings are one story. **Table 1**, PRGC Buildings, describes the approximate size, date of construction, and use of these buildings. In addition, there is one tower and a number of small target-launching stands.

Vegetation within the PRGC facility is limited to scattered grasses between the concrete pathways on the trap and skeet fields; this area is littered with shooting target debris. There are a number of trees near the clubhouse, along the southeastern property boundary adjacent to John Muir Drive, and near the southwestern end of the site. To the north of the PRGC facility, the SFPUC property slopes downward steeply toward Lake Merced and is vegetated by shrubs, rushes, and grasses.

[1] Upland refers to the elevated areas lying above the level where water flows or where flooding occurs.



SOURCE: ESA

Pacific Rod and Gun Club . 120468.02

Figure 1
Project Location

Explanation

Approximate Limit of Soil Remediation

0 100
Feet

SOURCE: ESA, 2013

Pacific Rod and Gun Club . 120468.02

Figure 2
Site Plan

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TABLE 1
PRGC BUILDINGS

Building	Construction Date	Approximate Width and Length (in feet)	Use
Clubhouse	1937	40 x 76	Dining facilities and hall for club social activities; also available for rental
Caretaker's House	ca. 1937	22 x 40	Former residence
Rifle Range Building	1939	23 x 114	Indoor rifle range, trophy room, and restroom
Shell House	ca. 1939 expanded 1949	21 x 65	Concession area, kitchen/meeting area, and office
Trap House	ca. 1960	27 x 30	Meeting room, kitchen
Restroom Building	ca. 1965	11 x 20	Public restrooms
Barbeque Shed	ca. 1970	10 x 15	Barbeque storage
Three-Vehicle Garage	ca. 2000	21 x 30	Garage

A.2 Project Background

At the skeet and trap ranges, shotguns are used to shoot pellets (or shot) at clay targets, causing the shot, targets, and debris to fall along the shoreline (or upland areas) and into the lake. Shotgun shells containing lead shot were discharged until 1994 and, until 2000, clay targets made with asphaltic materials or petroleum pitch (which typically contain polycyclic aromatic hydrocarbons [PAHs]), were used on-site. Shot and targets currently used at the skeet and trap ranges no longer contain lead or asphaltic materials.

Based on the number of shells fired in 1989, it was estimated that 27 tons of shot per year were deposited in Lake Merced. During one dredging effort to reclaim lead pellets in 1985 to 1986, the CCSF removed 128 tons of lead shot and debris from Lake Merced.[2] Additional investigations since that time have determined that elevated concentrations of carcinogenic PAHs, lead, and other heavy metals, including arsenic are present in the site's soil and lake sediments.[3,4]

In June 2013, the California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region issued Site Cleanup Requirements Order No. R2-2013-0023 to the PRGC and the SFPUC. The order rescinded and replaced an earlier cleanup order from 1994 (Order No. 94-017), which required cessation of the deposition of lead shot into the waters of Lake Merced and an evaluation of potential risks to waterfowl from ingestion of lead shot. Order R2-2013-0023 considers the site as two separate units—upland soils and

2 California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), 2013. *Order No. R2-2013-0023. Revised Site Cleanup Requirements and Rescission of Order No. 94-017 for Pacific Rod and Gun Club and City and County of San Francisco Public Utilities Commission for the property located at 520 John Muir Drive, Lake Merced, San Francisco*. June 12, 2013.

3 Ibid.

4 AMEC Environment and Infrastructure, Inc. (AMEC), 2013. *Remedial Action Plan, Pacific Rod and Gun Club, San Francisco, California, Prepared for San Francisco Public Utilities Commission*. July 2013.

the lake sediments—and establishes specific site investigation or remediation tasks and compliance schedules for each unit. The general limits of the upland soils area, the project site, are shown on Figure 2.

Order R2-2013-0023 requires the completion of three tasks for the upland soils area: 1) an evaluation of human health risks associated with the exposure to site contaminants and development of appropriate human health cleanup standards; 2) preparation of a remedial action plan (RAP) for removing or managing soil to meet the human health cleanup standards; and 3) implementation of the RAP. The first two tasks have been completed and are discussed further below; the project considered in this initial study (IS) consists of the third task, RAP implementation. For lake sediments, Order R2-2013-0023 requires the preparation of an ecological risk assessment to determine whether elevated levels of lead, arsenic, and PAHs in lake sediments pose an unacceptable risk to benthic organisms[5] and wildlife. If this investigation indicates that there are unacceptable risks to the benthic community and wildlife exposed to contaminants in site sediments, then the RWQCB Order requires preparation and implementation of a RAP for lake sediments.

A supplemental site investigation and human health risk assessment[6] was performed for the upland soils area to supplement previous investigations and to provide the data needed to support the human health risk assessment. As part of the supplemental site investigation, soil borings were advanced at 60 locations using a 100-foot-square grid system. Discrete soil samples were collected from depths of approximately 0.5, 1.0, 1.5, 2.0 and 3.0 feet below ground surface (bgs). One hundred eighty-one samples were analyzed for metals and PAHs, the primary constituents of potential human health risk at the site. The results of the supplemental site investigation, along with the findings of previous environmental investigations, indicate that elevated concentrations of lead are primarily found in upland soil closest to the shoreline; PAHs in soil appear to be distributed at elevated concentrations throughout the site, with higher concentrations found near the shoreline. Concentrations of lead in soil at the site range from "non-detect" (less than 2 milligrams per kilogram [mg/kg]) to 10,000 mg/kg, while detected concentrations of benzo(a)pyrene (a PAH) ranged from non-detect (less than 5 micrograms per kilogram [μg/kg]) to 1,200,000 μg/kg. Concentrations of lead and PAHs in soil are typically restricted to shallow soils and generally decrease with depth. Based on the concentrations of soil contaminants, the preparers of the human health risk assessment concluded that there are potential human health risks from exposure to PAHs, lead, and to a lesser extent arsenic.[7] Based on current site use the risks are within an acceptable range for infrequent visitors, offsite residents, and recreational users; however, they exceed the acceptable risk for individuals with more frequent or regular exposure, such as employees. Risk reduction or risk management measures are needed to mitigate human exposure to lead, arsenic, and PAHs.

5 Benthic organisms live in sediments at the lake bottom.
6 AMEC, 2012. Supplemental Investigation and Health Risk Assessment, Pacific Rod and Gun Club. April 9, 2012.
7 Ibid.

In compliance with the first two tasks of Order R2-2013-0023, the SFPUC has established human health cleanup standards for the site and has prepared the RAP. The site cleanup goal for lead identified in the RAP is 80 mg/kg, based on the California Human Health Screening Level (CHHSL) for residential properties, published by the Office of Environmental Health Hazard Assessment.[8] For PAHs, the cleanup goal is 0.21 mg/kg, based on the site-specific background concentrations of PAHs in upland soil at the site, as approved by the RWQCB.[9,10] Although the SFPUC has no plans to construct housing at the site, cleanup to the residential property standard would achieve the remedial action objective of allowing unrestricted future use of the site for planning purposes.

The RAP proposes excavation to remove upland soils with concentrations of lead and PAHs above the designated cleanup standards as the only effective means of achieving the remedial action objective. The proposed project constitutes the implementation of the RAP, as outlined in more detail in the sections below.

A.3 Project Purpose

The project purpose is to remediate upland soils at the PRGC site in compliance with RWQCB Order No. R2-2013-0023. Completing the project would achieve the following objectives:

- Achieve the highest cleanup standards to minimize the risk of human exposure to elevated concentrations of lead, PAHs, and arsenic in site soils; this would avoid restrictions on site use and additional ongoing, monitoring, and maintenance requirements
- Reduce the potential for leaching of contaminants into Lake Merced

A.4 Project Characteristics

The upland soil remediation project consists solely of construction activities: site preparation, survey and excavation layout, soil excavation and removal, confirmation sampling, waste disposal, backfilling, and site restoration. These activities are described in the following sections. No new structures would be constructed as part of the project. All existing buildings would remain. Before construction, smaller structures, such as target launching stands and towers, would be moved to a secure location onsite or off site in coordination with the PRGC, whose activities would be suspended due to site closure during the approximately 57-week construction period.[11] There are no operations or ongoing maintenance activities associated with the soil remediation.

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8 OEHHA, 2009. *Revised California Human Health Screening Levels for Lead*. September, 2009. http://oehha.ca.gov/risk/pdf/LeadCHHSL091709.pdf.

9 AMEC, 2013. *Remedial Action Plan: Pacific Rod and Gun Club, San Francisco, California.* Prepared for the San Francisco Public Utilities Commission. July 12, 2013.

10 RWQCB, 2013. *Water Board staff concurrence with the Human Health Cleanup Standards for the Pacific Road and Gun Club property located at 520 John Muir Drive, Lake Merced, San Francisco*. August 29, 2013.

11 The existing PRGC lease for the site expires in January 2015 and it is unknown at this time whether this lease will be renewed. Regardless, the project that is the subject of this Initial Study/Mitigated Negative Declaration is limited to the proposed soil remediation, as ordered by the RWQCB.

A.4.1 Site Preparation and Survey

Before construction, the selected contractor would develop a site operations plan that identifies construction equipment staging and support areas, site access, exclusion areas, excavation areas, soil stockpile areas, truck lanes, parking areas, and site office trailers. Because most of the site would be disturbed, the location of construction equipment staging and support areas would be dynamic and would change as construction progresses. The site would likely be divided into multiple zones, with excavation and backfilling occurring simultaneously in different zones. Support areas and stockpiles would be placed in a zone not subject to excavation, while excavation and backfilling would be within the exclusion zones. All of these activities would take place within the project site and would be relocated within the project site as remediation progresses. The operations plan would show the location and type of temporary construction fencing needed to maintain security at the site during construction to prevent public access; this includes fencing near the shoreline of Lake Merced.

A.4.2 Utility Clearance

Before construction, the contractor would coordinate with utility owners and a qualified, private utility locator to mark subsurface utilities. The contractor would expose and confirm the location of all buried utilities before grading and excavation. Buried utilities would be protected where feasible, or they would be removed and/or diverted and reconnected as needed following construction.

A.4.3 Removal of Surface Debris and Trees

Fragments of targets and shot debris litter the shooting ranges and the ground next to the shoreline. All surface debris in the project area would be collected and stockpiled. Analytical testing of samples from the stockpile would determine the disposal requirements (i.e., whether at a Class II or Class III disposal facility would be required). In addition, asphalt and concrete ground surfaces would be removed and disposed of offsite as construction debris. Miscellaneous site features, including benches and tables and wooden and chain-link fencing within the site, would be removed and recycled, if not previously removed by the PRGC.

Most trees and vegetation within the project site need to be removed to ensure that contaminated soils in excess of the Human Health Cleanup Goals approved by the RWQCB are effectively remediated. Of the 88 trees within the project site, up to 7 trees may be retained due to their proximity to structures. **Figure 3**, Tree Survey, identifies trees proposed for removal and those that may be retained.

Surveyed Trees

Trees 66-89

Trees that may be retained

Site Features

Approximate Property Boundary

0 100

Feet

SOURCE: AMEC

Pacific Rod and Gun Club . 120468.02

Figure 3

Tree Survey

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A.4.4 Soil Excavation and Removal

Based on the sampling results and grid system established in the supplemental site investigation described above, the RAP and subsequent sampling[12] outline the depth of soil to be excavated in each grid square to achieve the cleanup goal (**Figure 4**, Remedial Excavation Depths). Remedial excavation would be predominantly within the upland area, although some limited excavation would occur within wetland areas (see Section E.13, Biological Resources). The site would be demarcated into 100-foot by 100-foot grid squares. The depth of soil that would be excavated in each grid square is based on concentrations of lead and PAHs detected above proposed cleanup goals for unrestricted use. Excavation depths generally range from 0.5 to 4.0 feet bgs, as shown on Figure 4, although excavation would extend to 7 feet at four locations. The estimated volume of soil to be excavated is approximately 41,300 cubic yards. If additional excavation is needed, the total excavation volume could be up to approximately 46,500 cubic yards. This higher estimate was used for this initial study to provide a reasonable worst-case analysis of potential environmental effects.

A California-licensed hazardous waste contractor would excavate and remove the contaminated soil. Conventional off-road equipment would be used to excavate, handle, and load the soil. Excavated soil would be stockpiled onsite and would be characterized to determine appropriate disposal requirements.

A.4.5 Confirmation Sampling

Confirmation samples would be collected after excavating to the depths shown on Figure 4 to confirm attainment of cleanup objectives; i.e., that the lead and PAH concentrations, if any, in soil are below the cleanup goals. Sampling would be performed in accordance with the composite sampling method described in the RAP.[13] Data validation and review would be completed before final demobilization, in the event that additional excavation is required, to ensure that the cleanup goals are met.

A.4.6 Characterization and Treatment of Excavated Soil for Disposal

As required by law, composite sampling and laboratory analysis of excavated soil would be performed to determine appropriate disposal facilities, in accordance with the hazardous waste classification of excavated soils. Given that concentrations of lead in soil at the site range from non-detect (less than 2 mg/kg) to 10,000 mg/kg, soil characterization may classify soil as either Resource Conservation and Recovery Act (RCRA) hazardous waste,[14] non-RCRA California hazardous waste, or nonhazardous waste.

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12 AMEC, 2014. *Potential Excavation Boundaries Plan*, February 13, 2014.

13 AMEC, 2013. *Remedial Action Plan: Pacific Rod and Gun Club, San Francisco, California.* Prepared for the San Francisco Public Utilities Commission. July 12, 2013.

14 RCRA (40 CFR, Part 260) outlines the regulations governing hazardous waste identification, classification, generation, management, and disposal.

Remediation area   Sampling grid   1.0 Design excavation depth (ft bgs)

SOURCE: AMEC, 2/14/2014

Pacific Rod and Gun Club . 120468.02

Figure 4

Remedial Excavation Depths

It may be possible to improve the waste classification of soil containing lead by the use of soil washing or chemical stabilization. Soil washing separates lead particles from soil by wet sieving and gravity separation.[15] Separated lead can then be recycled. In chemical stabilization, the leachability of lead is reduced through an additive, such as calcium phosphate.[16] To investigate the feasibility of these approaches, samples may be collected and tested for suitability.

The ultimate use of these techniques would depend on the results of testing and on economic considerations, such as the relative costs of landfill disposal and soil treatment. All equipment and activities would be located within designated areas with appropriate secondary containment. Wastewater from soil washing or chemical stabilization would be discharged to the CCSF's combined sewer system.

A.4.7 Waste Management and Disposal

Materials generated during remediation would be stockpiled on-site, separated according to waste characterization criteria, and either recycled or disposed of in compliance with all applicable regulatory standards. Stockpiles of potential Class I and Class II material would be segregated, stored within a bermed area on liner material, protected from stormwater run-on/runoff, and covered to prevent windblown dust. Any accumulated water would be collected from a low point within the bermed area and pumped into a portable storage tank. The contained water would be tested and treated, if necessary, before disposal. Following separation and characterization for disposal, wastes would be transported offsite to appropriate disposal facilities.

Disposal of impacted soils and other wastes generated as part of remediation would require a maximum of approximately 2,325 truck trips. Off-hauling excavated material would require up to approximately 10 truck trips per day for up to 48 weeks. Based on waste characterization results, soils could require disposal at a range of facilities. Preliminary facilities identified for soil disposal are the Clean Harbors Buttonwillow Facility (Class I) in Buttonwillow, California, and the Recology Hay Road Landfill (Class II, III) in Vacaville. Local truck routes are anticipated to include northbound travel on John Muir Drive to access the truck route on State Route (SR) 35 and southbound travel on John Muir Drive to Lake Merced Boulevard, Brotherhood Way, and 19th Avenue to access Interstate Highway 280 (I-280).

A.4.8 Backfilling and Site Restoration

Excavated areas would be backfilled with clean imported fill material and compacted to engineering specifications. The SFPUC would identify and approve potential import fill sources before delivery to the

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15 See Best Management Practices for Lead at Outdoor Shooting Ranges, EPA-902-B-1-001, June 2005. http://www2.epa.gov/sites/production/files/documents/epa_bmp.pdf.

16 See Chemical Stabilization of Lead in Small Arms Firing Range Soils, US Army Corps of Engineers, Engineer Research and Development Center, September 2003; http://el.erdc.usace.army.mil/elpubs/pdf/trel03-20.pdf.

site to ensure that fill generally conforms to the guidelines set forth in the Department of Toxic Substances Control (DTSC) Fill Advisory.[17] Transporting backfill to the site would require a similar number of trucks as off-hauling excavated material; therefore, backfilling would require up to approximately 2,325 truck trips to the site with imported fill. Because excavating and backfilling would be conducted simultaneously, the total number of truck trips per day would be about 20 (10 for excavated materials, 10 for backfill).

The backfilled excavation would be compacted according to engineering specifications and graded to return the site to conditions similar to the existing site. Some of the existing paved areas would be replaced with compacted base (permeable surface), as required by the Stormwater Management Ordinance.[18] Suitable erosion controls, such as hydroseeding with native plant species, would be provided during restoration.

A.4.9 Construction Equipment

Construction equipment required for the above-described project activities would include at least two each of hydraulic excavators, backhoe loaders, and crawler dozers; a wheel loader; 20-cubic-yard dump trucks; a flat-bed delivery truck; a forklift; a vibrator; and a pickup truck. Some types of equipment would be needed only for certain phases of construction, as shown in **Table 2**, Construction Schedule, Equipment, and Workforce. Approximately 50 truck trips would be needed for mobilizing and demobilizing equipment.

TABLE 2
CONSTRUCTION SCHEDULE, EQUIPMENT, AND WORKFORCE

Activity	Equipment	Number of Construction Workers	Estimated Duration (weeks)
Site preparation	Forklift, pickup truck, 2 backhoe loaders	10–15	2
Utility identification and removal	2 backhoe loaders	10–15	1
Removal of target debris, concrete pads, and trees	Hydraulic excavator	15–20	2
Excavation and backfilling	2 hydraulic excavators, forklift, dump trucks	25–30	48
	Soil washing or stabilization equipment, if used (see text)	10–15	
Site and surface restoration	Vibrator, forklift, pickup truck	15–20	4
Total duration of site remediation			57

17 Department of Toxic Substances Control (DTSC), 2001, *Information Advisory—Clean Imported Fill Material*, 4 pp. fact sheet, October.

18 City and County of San Francisco, 2010. Ordinance No. 83-10, Requiring the Development and Maintenance of Stormwater Management Controls, Public Works Code Article 4.2, Sections 147-147.6, April 22, 2010.

If used, typical soil washing equipment would be a trailer-mounted washing unit, a sediment processor, a sediment washing unit, a cavitation unit, hydrocyclones, shaker screens, water treatment equipment, tanks, and compressors. Typical equipment for chemical stabilization would be trailer-mounted treatment systems or mixing equipment typical of the concrete industry.

A.4.10 Staging Areas

Staging areas would be within the project site and would move around as construction progresses. These areas would be used for temporarily storing debris boxes and segregated stockpiles of concrete and asphalt debris, fencing and miscellaneous nonhazardous debris, recyclable metals, and excavated soil. In addition, construction-related equipment and materials, such as construction vehicles and small quantities of fuels and lubricants, could be stored onsite.

A.4.11 Site Access

Access to and from the site would be from the PRGC driveway on John Muir Drive. If necessary permits can be obtained, a temporary entrance may be installed on John Muir Drive to more efficiently provide for truck traffic circulation. Approximately 10 street parking spots near the site entrance(s) would be restricted during construction for public safety and to provide adequate access for construction vehicles. Construction workers would park in designated areas onsite.

A.4.12 Construction Schedule and Workforce

Table 2 presents a summary of the construction activities and their estimated durations, as well as the number of workers expected for each phase of construction. Construction is proposed to begin in January 2015.

Construction is estimated to take up to 57 weeks. This is a conservative estimate that assumes excavation would be needed in areas that would require confirmatory sampling before excavation. Construction hours are proposed to be Monday through Friday, from 7:00 a.m. to 6:00 p.m. No nighttime or weekend construction is anticipated or proposed.

A.4.13 Noticing of Construction

The SFPUC has established standard construction measures to be included in all construction contracts.[19] In advance of project construction, the SFPUC would provide a 10-day public notice describing project construction activities, schedule information, anticipated effects, such as temporary closure of parking

[19] SFPUC, 2007. Standard Measures to be Included in Construction Contracts and Project Implementation. February 7, 2007.

spaces or detours, and contact information. The notice would be distributed to adjacent property owners and residents and would be included on the SFPUC website, along with project information.

A.5 Project Approvals

This initial study/mitigated negative declaration (IS/MND) provides the information and analysis necessary to help public agency decision-makers consider the approvals necessary for project planning, development, and construction. Permits and authorizations would be required from federal, state, and local agencies, which could rely in whole or in part on this IS/MND. The relevant agencies and permits could include the following:

Federal

- US Army Corps of Engineers (Corps): Clean Water Act (CWA) Section 404 permit

State

- California Coastal Commission (CCC): Issuance of Coastal Development Permit (wetlands affected by the project are potentially within CCC's retained permit jurisdiction for Lake Merced)
- State Water Resources Control Board (SWRCB): National Pollutant Discharge Elimination System (NPDES) order 2009-0009-DWQ, General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit)
- California Department of Fish and Wildlife (CDFW): Section 1602 Streambed Alteration Agreement
- RWQCB: Approval of the RAP and CWA Section 401
- Bay Area Air Quality Management District (BAAQMD): Construction permit

Local

- San Francisco Planning Commission: Approval of a Coastal Development Permit
- SFPUC: Approval of the project and construction contracts, wastewater enterprise stormwater control plan, and other implementation actions
- San Francisco Board of Supervisors: Approval of the RAP, appropriation of funding, consideration of any appeals of the Planning Commission's adoption of the IS/MND
- San Francisco Department of Public Works (SFDPW): Approval of any necessary construction permits for additional site entrance, if needed, and street parking restrictions
- San Francisco Department of Parking and Traffic: Approval of any necessary construction permits for additional site entrance and street parking restrictions

B. PROJECT SETTING

B.1 Regional and Local Setting

The project site is next to the southern shore of Lake Merced's South Lake in San Francisco. The site is an irregularly shaped parcel between South Lake and John Muir Drive, which trends northwest/southeast. The site is approximately 1,500 feet long, 350 feet wide at its western end, and 150 feet wide at its eastern property boundary.

The land surface slopes gently to the northeast across the site parking lot and trap and skeet fields. Ground surface elevations across the site range from approximately 45 feet above mean sea level (amsl) at the southwestern corner near John Muir Drive to 25 feet amsl near the northeastern corner.[20] To the north of the project site remediation area, the land surface slopes steeply down to the shore of Lake Merced, located between approximately 10 and 150 feet from the remediation area boundary. This area is occupied by dune scrub, riparian, and wetland vegetation.

Undeveloped areas bordering the project site on the north side of John Muir Drive include a dense stand of trees and an arm of South Lake to the west and a narrow strip of low-lying riparian wetland to the east. The San Francisco Police Department's outdoor and indoor weapons firing range and bomb disposal facility is also next to Lake Merced and north of John Muir Drive, about 600 feet northwest of the site. Multifamily apartments are across John Muir Drive, approximately 150 feet south of the site. Other than these apartments, the vicinity is generally characterized by recreation and open-space uses. Three golf courses are next to Lake Merced: TPC Harding Park to the north, San Francisco Golf Club to the east, and the Olympic Club to the south. Fort Funston, part of the Golden Gate National Recreation Area, is across Highway 35, approximately 750 feet west of the site, next to the Pacific Ocean. Other residential areas are more than half a mile from the site.

Lake Merced is a nonpotable emergency water supply for San Francisco, to be used for firefighting or sanitation if no other sources of water are available. In the event of a major disaster (e.g., catastrophic earthquake), this supply could be pumped into the CCSF's drinking water distribution system to maintain firefighting, basic sanitation (e.g., flush toilet), and other critical needs.

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20 AMEC, 2013. *Remedial Action Plan: Pacific Rod and Gun Club, San Francisco, California.* Prepared for the San Francisco Public Utilities Commission. July 12, 2013. Ground elevations are based on the San Francisco City Datum, which is 11.37 feet above NAVD88.

B.2 Other Projects in the Vicinity

Past, present, and reasonably foreseeable future projects occurring in the vicinity could result in cumulative impacts, in combination with the PRGC Upland Soil Remediation Project's impacts. These projects are as follows:

- Several projects involving the SFPUC (the San Francisco Groundwater Supply Project, the Regional Groundwater Storage and Recovery Project, the City of Daly City Vista Grande Drainage Basin Improvement Projects, and the Westside Recycled Water Project)
- Resource and open space management plans (Significant Natural Areas Management Plan, Fort Funston Site Improvements, and the Golden Gate National Recreation Area General Management Plan)
- Other residential and mixed-use projects identified by the local planning agencies in the project vicinity (Parkmerced Project, San Francisco State University Campus Master Plan, and 2800 Sloat Boulevard)

Table 3 in Section E, Evaluation of Environmental Effects, describes the potential cumulative projects in the project vicinity. The discussion of potential cumulative impacts is included in the individual environmental issue area subsections within Section E.

C. COMPATIBILITY WITH EXISTING ZONING AND PLANS

	Applicable	*Not Applicable*
Discuss any variances, special authorizations, or changes proposed to the Planning Code or Zoning Map, if applicable.	☐	☒
Discuss any conflicts with any adopted plans and goals of the City or Region, if applicable.	☒	☐
Discuss any approvals and/or permits from City departments other than the Planning Department or the Department of Building Inspection, or from Regional, State, or Federal Agencies.	☒	☐

No variances, special authorizations, or changes to the San Francisco Planning Code or Zoning Map are proposed as part of this project; therefore, these issues are not applicable and are not discussed further.

This section provides a general description of the land use plans and policies and how they apply to the project. Also discussed are potential inconsistencies between the project and the applicable plans. Whether a project is consistent with particular plans for which a consistency determination is required is decided at the time of project approval by the agency charged with that determination. Land use plans typically contain numerous policies emphasizing differing legislative goals, and an interpretation of consistency requires balancing all relevant policies. The board or commission that enacted a plan or policy determines the meaning of the policy and whether an individual project satisfies the policy at the time the board considers approval of the project.

This section discusses the plans and policies of the CCSF, the SFPUC, and other local plans that apply to the project area. The project site is in San Francisco and is owned by the CCSF; the SFPUC has exclusive jurisdiction over the property. As it is an agency of the CCSF, the SFPUC is under the jurisdiction of the CCSF's charter and plans, where applicable. In addition, the SFPUC has adopted plans specific to the management of its water resources. The other local plans discussed here are also relevant to the evaluation of project impacts and the compatibility of the project with certain aspects of local land use plans and policies.

C.1 City and County of San Francisco Plans and Policies

The project is subject to the San Francisco General Plan, which provides policies and objectives to guide land use decisions. In addition, the San Francisco City Charter and other CCSF plans and policies guide SFPUC decisions. These plans are as follows:

- **San Francisco General Plan—**Sets forth the CCSF's comprehensive, long-term planning, land use policy
- **Western Shoreline Area Plan—**The CCSF's certified local coastal program, which is part of the General Plan and governs land use and development in San Francisco's Coastal Zone in accordance with the California Coastal Act
- **Accountable Planning Initiative—**Establishes priority policies to guide decision makers in balancing the objectives of the San Francisco General Plan
- **San Francisco Bicycle Plan—**Includes a citywide transportation plan and specific bicycle improvements
- **San Francisco Sustainability Plan—**Addresses the long-term sustainability of the city

In addition, in Section C.2, SFPUC Plans and Policies, is a description of the SFPUC's plans and policies. The SFPUC Strategic Sustainability Plan provides a framework for planning, managing and evaluating overall SFPUC business performance.

C.1.1 San Francisco General Plan

The San Francisco General Plan[21] sets forth the comprehensive long-term land use policy for the CCSF. The general plan consists of 10 issue-oriented plan elements: air quality, arts, commerce and industry, community facilities, community safety, environmental protection, housing, recreation and open space, transportation, and urban design. Plan elements relevant to the project are briefly described below.

- **Air Quality Element—**Promotes clean air planning through objectives and policies that ensure compliance with air quality regulations.

[21] CCSF, 1988. San Francisco General Plan. As amended through 1996.

- **Commerce and Industry Element—**Guides decisions on economic growth and change in San Francisco. The three goals of the element—continued economic vitality, social equity (with respect to employment opportunities), and environmental quality—address citywide objectives as well as those of San Francisco's major economic sectors.
- **Community Safety Element—**Addresses potential geologic, structural, and nonstructural hazards to CCSF-owned structures and critical infrastructure, with the goal of protecting human life and property from such hazards.
- **Environmental Protection Element—**Addresses the impact of urbanization on the natural environment by promoting the protection of plant and animal life and freshwater sources and addressing the CCSF's responsibility to provide a permanent clean water supply to meet present and future needs as well as to maintain an adequate water distribution system.
- **Recreation and Open Space Element—**Composed of several sections, each dealing with a certain aspect of the CCSF's recreation and open space system: (1) the Regional Open Space System, (2) the Citywide Open Space System, (3) the shoreline, (4) the neighborhoods, and (5) downtown.
- **Urban Design Element—**Promotes the preservation of landmarks and structures with notable historic, architectural, or aesthetic value and seeks to balance development with the natural environment and visual features.

The project would remove contaminated soils at the site. This would protect public health from potential harmful exposures to contaminated soil and would protect Lake Merced water quality from the potential leaching of contaminants into the lake. Thus, the project would promote the protection of plant and animal life and would support the health and safety of the post-remediation occupants and users of the project site. The project would not obviously or substantially conflict with the environmental protection and community safety elements of the General Plan.

Proposed site remediation would not permanently affect land uses within CCSF boundaries (also see Section 5.2, Land Use), as project implementation would not permanently remove structures or build new structures (minor facilities, such as fences and concrete sidewalks, would be removed before remediation activities). Land use policies relevant to the project site are included in the Recreation and Open Space and Urban Design elements and in the Western Shoreline Area Plan of the San Francisco General Plan, as described below.

The Recreation and Open Space element policies address the development, preservation, and maintenance of open spaces; the preservation of sunlight in public open spaces; the elimination of non-recreational uses in parks and the reduction of automobile traffic in and around public open spaces; the maintenance and expansion of the urban forest; and the improvement of the western end of Golden Gate Park for public recreation. Policies specific to the Lake Merced area are described further under Western Shoreline Area Plan, below. The proposed soil remediation would temporarily disrupt recreational trap and skeet shooting and clubhouse functions at the site; however, the project would not interfere with the long-term recreational use of the site.

The Urban Design element policies include protecting major views of the city; conserving resources that provide a sense of nature, continuity with the past, and freedom from overcrowding; preserving notable landmarks and areas of historic, architectural or aesthetic value; preserving areas that have not been developed by man; limiting improvements in open spaces having an established sense of nature to those that are necessary; promoting high-quality design for buildings to be constructed at prominent locations; promoting building forms that respect and improve the integrity of open spaces and other public areas; and, installing and maintaining landscaping in public and private areas. As noted above, project implementation would not permanently remove structures (including potential historic buildings) or build new structures; therefore, building design and form policies are not applicable. As discussed in Sections E.2, Aesthetics, and E.4, Cultural and Paleontological Resources, site remediation requires removing site trees and surface features, although it would preserve the overall architectural and aesthetic value of the area.

The project area is within the Western Shoreline Area Plan. An area plan is a more specific version of the general plan, written for a smaller area within the jurisdiction of the CCSF. The Western Shoreline Area Plan is discussed below.

Western Shoreline Area Plan

The Western Shoreline Area Plan, which is part of the General Plan, is the CCSF's certified Local Coastal Program, which implements the requirements of the California Coastal Act of 1976 for the City's Coastal Zone. The Western Shoreline Area Plan includes objectives and policies pertaining to land use and development along the City's western shoreline extending approximately 6 miles, from Fort Funston to the Point Lobos, including the western portion of Golden Gate Park and Lake Merced. Policies and objectives related to the Lake Merced area include preserving natural habitat, recreational facilities, passive activities, playgrounds, and vistas of the Lake Merced area; maintaining a recreational pathway around the lake for multiple uses; and allowing only activities that would not adversely affect the lake's water quality as a standby reservoir for emergency use.

The proposed soil remediation would not permanently displace recreational or open-space uses (see Section E.10, Recreation). Proposed tree removal would alter the visual character of the site. It would open views of the site and of Lake Merced from the adjacent lake perimeter recreational trail, sidewalks, and John Muir Drive, as discussed in Section E.2, Aesthetics. Also, as discussed in Section E.5, Transportation and Circulation, the project would not result in a long-term increase in automobile traffic in and around public open spaces; bicycle routes along John Muir Drive would be accessible during construction. The project would result in tree and vegetation removal, as discussed in Section E.13, Biological Resources; however, effects on special-status species could be avoided. Remediation of contaminated upland soils would reduce the risk of adverse impacts on the lake's water quality and potential use as a standby reservoir for nonpotable emergency uses.

Overall, there are no apparent inconsistencies between the San Francisco General Plan (including the Western Shoreline Area Plan) and the project. Any conflict between the project and General Plan policies that relate to physical environmental issues are discussed in Section E, Evaluation of Environmental Effects. As part of their determination to approve or disapprove the project, decision makers will consider the compatibility of the project with General Plan policies that do not relate to physical environmental issues. Any potential conflicts identified as part of that process would not alter the physical environmental effects of the project, as analyzed in this IS/MND.

C.1.2 The Accountable Planning Initiative

In November 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative, which added Section 101.1 to the Planning Code to establish the following eight priority policies as a preamble to the San Francisco General Plan. The priority policies are the basis for resolving inconsistencies in the general plan and are as follows:

1. Neighborhood-serving retail uses be preserved and enhanced and future opportunities for resident employment in and ownership of such businesses be enhanced

2. Housing and neighborhood character be conserved and protected in order to preserve the cultural and economic diversity of the neighborhoods

3. The city's supply of affordable housing be preserved and enhanced

4. Commuter traffic not impede MUNI transit service or overburden streets or neighborhood parking

5. A diverse economic base be maintained by protecting industrial and service sectors from displacement by commercial office development, and future opportunities for resident employment and ownership in these sectors be enhanced

6. The CCSF achieve the greatest possible preparedness to protect against injury and loss of life in an earthquake

7. Landmarks and historic buildings be preserved

8. Parks and open spaces and their access to sunlight and vistas be protected from development

The policies established as part of the Accountable Planning Initiative are part of the General Plan and will be evaluated by the Planning Department or Planning Commission as part of a finding of consistency before project approval. Of the eight priority policies, only the seventh and eighth (relating to historic buildings and open space) would be relevant to the project. As described in Section E.4, Cultural and Paleontological Resources, the project would not result in significant effects on landmarks or historic buildings. The site is not a historic landmark and no buildings would be altered or removed. The project would not impede access to sunlight and vistas. Thus, there are no apparent inconsistencies between the project and these policies.

C.1.3 San Francisco Bicycle Plan

In August 2009, the Board of Supervisors approved the San Francisco Bicycle Plan. It includes a citywide bicycle transportation plan (comprised of a Policy Framework and a Network Improvement documents) and implementation of specific bicycle improvements identified within the plan. The Bicycle Plan includes objectives and identifies policy changes that would enhance bicycle access and safety in San Francisco's bikeability. It also describes the existing bicycle route network (a series of interconnected streets in which bicycling is encouraged) and identifies gaps within the citywide bicycle route network that require improvement. The 2009 Bicycle Plan updates the 1997 Bicycle Plan. The final EIR analyzing the Bicycle Plan assessed 56 short-term and long-term bicycle improvement projects, including the bicycle lane along John Muir Drive which has been completed. The project would not affect bicycle improvements along John Muir Drive, and bicycle access and circulation would be maintained during project construction.

C.1.4 San Francisco Sustainability Plan

The San Francisco Board of Supervisors endorsed the Sustainability Plan for the City of San Francisco[22] in 1997, although it has not committed the CCSF to perform the actions addressed in the plan. The plan serves as a blueprint for sustainability, with many of its individual proposals requiring further development and public comment. The plan's underlying goals are to maintain the physical resources and systems that support life in San Francisco and to create a social structure that will allow such maintenance. It is divided into 15 topic areas, some of which address specific environmental issues: air quality, biodiversity, energy, climate change and ozone depletion, food and agriculture, hazardous materials, human health, parks, open spaces and streetscapes, solid waste, transportation, and water and wastewater. Other topic areas are broader in scope and cover many issues: the economy and economic development, environmental justice, municipal expenditures, public information and education, and risk management. Each topic area has a set of indicators that is to be used over time to determine whether San Francisco is moving in a direction that supports sustainability for that area.

The project seeks to remediate hazardous materials in soil, thereby protecting human health and reducing potential impacts on water quality in Lake Merced. Therefore, the project would not conflict with the goals of the plan.

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[22] CCSF, 1997. The Sustainability Plan for the City of San Francisco. Department of the Environment.

C.2 SFPUC Plans and Policies

C.2.1 SFPUC Strategic Sustainability Plan

The SFPUC's 2011 Strategic Sustainability Plan[23] provides a framework for planning, managing, and evaluating SFPUC-wide performance. It takes into account the long-term economic, environmental, and social impacts of the SFPUC's business activities. This plan consists of a Durable Section, which contains goals, objectives, and performance indicators to implement SFPUC's vision and values. The goals and objectives are then used to drive the Dynamic Section, which contains specific actions, targets, measures, and budgeting. The SFPUC uses this document to evaluate its performance semiannually, to provide an annual score card, and to help it measure progress annually. The plan contains actions to develop land use guidance, incorporating the Environmental Stewardship Policy and other land management principles for San Francisco properties.

C.3 Other Plans

C.3.1 Significant Natural Resource Areas Management Plan

In 1995, the San Francisco Recreation and Parks Department (SFRPD) adopted the Significant Natural Resource Areas Management Plan (SNRAMP) for designated significant natural areas within San Francisco, including Lake Merced. The purpose of the management plan was to establish a maintenance and preservation program to protect and enhance natural resource values.[24] The 1995 SNRAMP staff report sets forth a program to identify significant natural areas in San Francisco, develop a standardized procedure for inventorying these areas, and establish management policies and actions for their protection. General policies and management actions in the staff report relevant to biological resources at Lake Merced, include general policies to maintain/promote indigenous plant species and control/remove invasive species, protect special-status species, enhance riparian areas, and maintain/improve water quality of streams and ponds. The project would remediate hazardous materials in soil, thereby enhancing the site's natural resource value and reducing potential impacts on water quality in Lake Merced. Therefore, the project would not conflict with the goals of the plan.[25]

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23 SFPUC, 2011. SFPUC Strategic Sustainability Plan, March.

24 San Francisco Recreation and Park Department, 1995. Staff Report on the Significant Natural Areas Management Plan, January 19, 1995

25 The SFRPD proposed an update to the SNRAMP in 2006 to guide natural resource protection, habitat restoration, trail and access improvements, other capital projects and maintenance over the next 20 years. The proposed update to the plan contains detailed information about the biology, geology and trails in each of the 31 Natural Areas to identify and prioritize monitoring, restoration and management actions in those areas. A Draft Environmental Impact Report on the 2006 SNRAMP was issued in 2011, but has yet to be certified, so the 2006 SNRAMP has not yet been finalized and adopted, and thus is not in effect. However, these documents are mentioned because they provide relevant information about the natural resources setting of the Lake Merced area that is relevant to this analysis.

D. SUMMARY OF ENVIRONMENTAL EFFECTS

The project could potentially affect the environmental factor(s) checked below. The following pages present a more detailed checklist and discussion of each environmental factor.

☐ Land Use	☒ Air Quality	☒ Biological Resources
☒ Aesthetics	☐ Greenhouse Gas Emissions	☐ Geology and Soils
☐ Population and Housing	☐ Wind and Shadow	☐ Hydrology and Water Quality
☒ Cultural and Paleo. Resources	☐ Recreation	☐ Hazards/Hazardous Materials
☒ Transportation and Circulation	☐ Utilities and Service Systems	☐ Mineral/Energy Resources
☒ Noise	☐ Public Services	☐ Agricultural and Forest Resources
		☒ Mandatory Findings of Significance

E. EVALUATION OF ENVIRONMENTAL EFFECTS

This IS examines the project to identify potential effects on the environment. For each item on the IS checklist, the evaluation has considered the impacts of the project both individually and cumulatively. All items on the IS checklist that have been checked “Less than Significant with Mitigation Incorporated,” “Less than Significant Impact,” “No Impact,” or “Not Applicable” indicate that, upon evaluation, staff have determined that the project could not have a significant adverse environmental impact on that issue. A full discussion is included for all items checked “Less than Significant with Mitigation Incorporated” and “Less than Significant Impact,” and a brief discussion is included for items checked “No Impact” or “Not Applicable.” The items checked above have been determined to be Less than Significant with Mitigation Incorporated.

Environmental impacts are numbered throughout this IS/MND using the section topic identifier followed by sequentially numbered impacts. Mitigation measures are numbered to correspond to the impact numbers; for example, Mitigation Measure M-CP-1 addresses Impact CP-1 regarding cultural and paleontological resources. Cumulative impacts are discussed at the end of each environmental topic impact discussion and are identified by the letter C; for example, Impact C-CP addresses cumulative cultural and paleontological resources impacts.

Approach to Cumulative Impact Analysis

Two approaches to a cumulative impact analysis are provided in CEQA Guidelines Section 15130(b)(1): (1) the analysis can be based on a list of past, present, and reasonably foreseeable probable future projects producing closely related impacts that could combine with those of a project, and (2) a summary of projections contained in a general plan or related planning document can be used to determine cumulative impacts. The following factors were used to determine an appropriate list of individual projects to be considered in this cumulative analysis:

- **Similar Environmental Impacts—**A relevant project contributes to effects on resources that are also affected by the project. A relevant future project is defined as one that is "reasonably foreseeable," such as a project for which an application has been filed with the approving agency or whose funding has been approved.
- **Geographic Scope and Location—**A relevant project is one within the geographic area where effects could combine. The geographic scope varies on a resource-by-resource basis. For example, the geographic scope for evaluating cumulative effects on air quality consists of the affected air basin.
- **Timing and Duration of Implementation—**Effects associated with activities for a relevant project (e.g., short-term construction or long-term operations) would likely coincide with the related effects of the project.

Table 3 lists the plans and projects in the project vicinity considered in the cumulative impact analysis, based on the above-referenced factors. Cumulative projects which could have construction schedules that overlap with the construction of the project are listed in **bold**.

TABLE 3
CUMULATIVE PROJECTS IN THE PACIFIC ROD AND GUN CLUB PROJECT VICINITY

I.D. No.	Lead Agency	Project Name	Project Description	Potential Cumulative Impact Topics	Approximate Distance to Project Site	CEQA Status and Estimated Construction Schedule[a]
1	San Francisco Planning Department	**Significant Natural Resource Areas Management Plan (SNRAMP) - Proposed Update**	Fragments of unique plant and animal habitats within San Francisco and Pacifica, known as Significant Natural Resource Areas, have been preserved within parks that are managed by the San Francisco Recreation and Park Department (SFRPD). Management priorities have been set for these areas based on levels of sensitivity, species presence, and habitat complexity. The Lake Merced Natural Area covers approximately 395 of the lake's 614 acres and generally encompasses the lake, the bordering freshwater marsh wetland, and the upland vegetation. Activities prescribed specifically to Lake Merced are as follows: • Reintroducing sensitive species • Removing trees, in conformance with forestry statements • Implementing erosion-control measures as problems arise, including closing informal and social trails • Preventing invasive tree establishment • Prohibiting planting nonnative species	**Temporary:** Construction-related impacts on land use, population and housing; cultural resources; traffic; noise; air quality; utilities; biological resources; soil erosion; hydrology; and hazards **Long-term:** Impacts on aesthetics and biological resources	Next to the project site to the northwest, northeast, and southeast	**Status of environmental review:** Draft Environmental Impact Report (EIR) published in August 2011 **Construction schedule:** To be determined, 2014 or later
2	Daly City (SFPUC is a responsible agency)	**Vista Grande Drainage Basin Improvement Project**	The project would improve existing facilities and construct new facilities to screen stormwater, route flows to the Vista Grande Canal and to Lake Merced, route a portion of low flows through a constructed wetlands treatment system, control the water surface elevation in Lake Merced, and reduce the potential for localized flooding within the Vista Grande watershed. The project would consist of the following: • Improving the Vista Grande watershed collection system to improve the quality of stormwater runoff • Partially replacing the Vista Grande Canal to incorporate a gross solid screening device, a treatment wetland, and diversion and discharge structures to route some stormwater (and authorized nonstormwater) flows from the Vista Grande Canal to South Lake Merced • Replacing the Vista Grande Tunnel to expand its capacity • Replacing the outfall structure at Fort Funston	**Temporary:** Construction-related impacts on land use, population and housing; cultural resources; traffic; noise; air quality; utilities; biological resources; soil erosion; hydrology; and hazards **Long Term:** Impacts on aesthetics and biological resources	Nearest component approximately 0.1 mile south	**Status of environmental review:** Notice of Preparation (NOP) published February 2013 **Construction schedule:** Approximately 2016 through 2018

TABLE 3 (Continued)
CUMULATIVE PROJECTS IN THE PACIFIC ROD AND GUN CLUB PROJECT VICINITY

I.D. No.	Lead Agency	Project Name	Project Description	Potential Cumulative Impact Topics	Approximate Distance to Project Site	CEQA Status and Estimated Construction Schedule[a]
3	National Park Service	Fort Funston Site Improvements	Proposed site improvements at Fort Funston, including construction of restrooms and a maintenance facility, and other minor site enhancements. Onsite sewage system does not have adequate capacity to treat the estimated increase in wastewater from sinks and toilets in new restroom. Widening and straightening the entrance road, lengthening the turn lane from Highway 35 into the site, repaving and restriping the parking area, and upgrading picnic facilities are also planned.	**Temporary:** Construction-related impacts on population and housing; cultural resources; traffic; noise; air quality; utilities; and biological resources	Approximately 0.25 mile west	**Status of environmental review**: Preparation of Draft Environmental Assessment (EA) in progress; project was on hold from 2003 until 2008 **Construction schedule:** Unknown
4	National Parks Service	**Golden Gate National Recreation Area General Management Plan**	The plan creates the vision and framework to guide management of the park for the next 20 years, including land use policies. Plan activities at Ocean Beach and Fort Funston would be near the project site. The environmentally preferred alternative plans the activities below for Ocean Beach and Fort Funston. **Ocean Beach—**Address coastal erosion by relocating vulnerable facilities and restoring natural coastal processes; improve amenities along the Ocean Beach corridor; and improve trail connections to other natural areas nearby, including Lake Merced. **Fort Funston—**Construct new visitor facilities; extend native habitat along the perimeter and northern beach around the site; and expand operational facilities at the southeastern corner of the site, near Skyline Boulevard.	**Temporary:** Construction-related impacts on population and housing; cultural resources; traffic; noise; air quality; utilities; and biological resources	Nearest component approximately 0.25 mile west	**Status of environmental review:** Draft Plan/ Environmental Impact Statement (EIS) published in September 2011; Final Plan/EIS published April 2014 **Construction schedule:** The Plan will be implemented over 20 years following completion of planning. More detailed study and implementation planning will be required.
5	San Francisco Planning Department	**San Francisco Groundwater Supply Project**	The San Francisco Groundwater Supply Project would diversify San Francisco's water supply sources by building or converting up to six deep-water wells and associated treatment facilities around San Francisco. Groundwater pumped from these wells would be blended with Hetch Hetchy water at the Sunset and Sutro reservoirs and then distributed throughout the city using existing infrastructure. The project includes construction and operation of a well facility at the Lake Merced Pump Station, to the east of the project site, and five additional well facilities and distribution pipelines to the north of the project site.	**Temporary:** Construction-related impacts on cultural resources;; noise; utilities; biological resources; hydrology; and hazards	Nearest component approximately 0.5 mile east	**Status of environmental review:** EIR certified December 2013. **Construction schedule:** Lake Merced Well Facility construction scheduled January 2015 through April 2016

TABLE 3 (Continued)
CUMULATIVE PROJECTS IN THE PACIFIC ROD AND GUN CLUB PROJECT VICINITY

I.D. No.	Lead Agency	Project Name	Project Description	Potential Cumulative Impact Topics	Approximate Distance to Project Site	CEQA Status and Estimated Construction Schedule[a]
6	San Francisco Planning Department	San Francisco Westside Recycled Water Project	Construction of a recycled water treatment facility and underground storage and construction of new or upgrades to existing distribution facilities (pipelines and pumping facilities). Facility construction and upgrades that would occur in the vicinity of the project site are the construction of the recycled water treatment facility within the Oceanside Water Pollution Control Plant (WPCP) and the construction of a transmission pipeline along Skyline Boulevard, from the Oceanside WPCP to Sloat Boulevard	**Temporary:** Construction-related impacts on population and housing; cultural resources; traffic; noise; air quality; utilities; and biological resources	Nearest component approximately 0.75 mile northwest	**Status of environmental review:** NOP published in 2010; revised NOP anticipated to be published in 2014 **Construction schedule:** January 2016 through October 2018
7	San Francisco Planning Department	**3711 19th Avenue (Parkmerced)**	The Parkmerced Project is a long-term mixed-use development program to comprehensively replan and redesign the site. The project consists of the following: • Increase residential density • Provide a neighborhood core with new commercial and retail services • Modify transit facilities, including rerouting the MUNI Metro M Oceanview line from its current alignment along 19th Avenue • Install renewable energy sources, such as wind turbines and photovoltaic cells • Improve utilities and open space within the development site, including a new prekindergarten to 5th grade school and day care facility, a fitness center, new open space uses, an approximately two-acre organic farm, and community gardens Over approximately 20 years, 1,538 apartments would be demolished in phases and fully replaced and an additional 5,679 net new units would be added to the project site, for a total of about 8,900 units. In addition to renewable resources being installed, stormwater runoff from buildings and streets would be captured and filtered through a series of bioswales, ponds, and other natural filtration systems. The filtered stormwater would then either percolate into the groundwater that feeds the North Westside Groundwater Basin and Lake Merced or it would be released directly into Lake Merced.	**Temporary:** Construction-related impacts on population and housing; cultural resources; traffic; noise; air quality; utilities; and biological resources	Project located 0.7 mile east of the project site	**Status of environmental review:** EIR certified February 2011 **Construction schedule:** Phased construction from present through 2030

TABLE 3 (Continued)
CUMULATIVE PROJECTS IN THE PACIFIC ROD AND GUN CLUB PROJECT VICINITY

I.D. No.	Lead Agency	Project Name	Project Description	Potential Cumulative Impact Topics	Approximate Distance to Project Site	CEQA Status and Estimated Construction Schedule[a]
8	San Francisco Planning Department	**San Francisco State University Campus Master Plan**	The San Francisco State University Campus Master Plan (SFSUCMP) proposes physical changes and improvements to the campus to address increased enrollment. Some buildings and facilities would be upgraded and expanded, while others would be demolished and replaced. Some new buildings and facilities would be constructed. In total, these proposed physical improvements would result in the net addition of approximately 972,400 square feet and approximately 660 dwelling units to the campus. On November 14, 2007, the California State University Board of Trustees certified the final EIR and approved the 2007–2020 SFSUCMP. Implementation of the 2007–2020 SFSUCMP is underway. The renovation and expansion of the library was completed in March 2012 and Lot 20 Seismic Repairs and Access Modifications were completed in March 2012. **Recreation Wellness Center.** Funded through a student fee, the proposed Recreation Wellness Center is a significant addition to San Francisco State University, revitalizing the northern edge of campus and providing a major new student activity center. The campus master plan located the project on North State Drive; however, given the continued useful life of the Library Annex buildings on that site, the Recreation Wellness Center project has been relocated to the former Sutro Library/Lot 25 site on Winston Drive. The program for the 112,000-square-foot facility includes a two-court gym, a one-court multi-activity gym (for basketball, volleyball, badminton, soccer, and hockey), a climbing wall, weight and fitness space, and an elevated jogging track.	**Temporary:** Construction-related impacts on population and housing; cultural resources; traffic; noise; air quality; utilities; and biological resources	Project located approximately 1 mile northeast of the project site	**Status of environmental review:** Final EIR published August 2007; Recreation Wellness Center Final MND published January 2013 **Construction schedule:** Unknown but could begin at any time; Recreation Wellness Center construction planned for 2014–2016
9	San Francisco Planning Department	2800 Sloat Boulevard	Development of 3 new five-story buildings on Sloat Boulevard at 46th Avenue. The project would require demolition of existing buildings. The new buildings would total 55 dwelling units, 48 parking spaces in an underground parking garage, 26,000 sf of ground floor retail, and 34 covered spaces for commercial use.	**Temporary:** Construction-related impacts on population and housing; cultural resources; traffic; noise; air quality; utilities; and biological resources	Project located approximately 1.5 miles north of project site	**Status of environmental review:** Final MND approved; Performance period extended for 3 years to February 2015. **Construction schedule:** Unknown

TABLE 3 (Continued)
CUMULATIVE PROJECTS IN THE PACIFIC ROD AND GUN CLUB PROJECT VICINITY

I.D. No.	Lead Agency	Project Name	Project Description	Potential Cumulative Impact Topics	Approximate Distance to Project Site	CEQA Status and Estimated Construction Schedule[a]
10	San Francisco Planning Department	**Regional Groundwater Storage and Recovery Project**	The project facilities would include up to 16 new groundwater production well facilities within the South Westside Groundwater Basin. Each groundwater well facility site would contain a groundwater production well, pump station, underground distribution piping, utility connections, and disinfection unit. Well facilities would be connected to Daly City, San Bruno, California Water Service Company, or SFPUC distribution systems. In addition, upgrades to the Westlake pump station in Daly City are planned as part of the project.	**Temporary:** Construction-related impacts on population and housing; cultural resources; traffic; noise; air quality; utilities; and biological resources	Nearest component approximately 1.5 miles southeast	**Status of environmental review:** Draft EIR published April 2013 **Construction schedule:** June 2014 through May 2016
11	San Francisco Planning Department	**800 Brotherhood Way**	The construction of up to 182 dwelling units on an approximately 7.7 acre undeveloped site located on the north side of Brotherhood Way. The project would involve subdividing the site into about 121 lots and constructing 60 single-family homes and 61 2-unit dwellings, and includes additional on- and off-street parking, tree removal, and a new traffic light on Brotherhood Way.	**Temporary:** Construction-related impacts on population and housing; cultural resources; traffic; noise; air quality; utilities; and biological resources	Approximately 1 mile east	**Construction schedule:** Under construction; first phase expected to last at least through spring 2015

Projects in **bold** could have construction schedules that overlap with project construction.

[a] Construction schedules were estimated based on information obtained in project-related documents, such as initial studies and EIRs; city, county, and regional agency websites; and communication with representatives from local jurisdictions. As with all proposed development projects, estimated construction schedules are subject to revisions and delays and therefore could vary from the times indicated.

TBD = To be determined

SOURCES: San Francisco Planning Department, 2011. *Draft Environmental Impact Report: Significant Natural Resources Areas Management Plan*, Volume 1. August.; City of Daly City, 2013. *Notice of Preparation/Notice of Intent to Prepare a Joint EIR/EIS for the Vista Grande Drainage Basin Improvement Project*, February 28.; National Park Service, 2013. *Fort Funston Site Improvements*. http://parkplanning.nps.gov/projectHome.cfm?parkId=303&projectId=15201. Accessed October 31, 2013.; National Park Service, 2011. *Golden Gate National Recreation Area Muir Woods National Monument Draft General Management Plan/Environmental Impact Statement*, Volume 2. August.; San Francisco Planning Department, 2013. *San Francisco Groundwater Supply Project Final Environmental Impact Report*, Volume 1. December.; San Francisco Planning Department, 2010. *Revised Notice of Preparation of an Environmental Impact Report: San Francisco Westside Recycled Water Project*. September 8.; San Francisco Planning Department, 2010. *Parkmerced Project Draft Environmental Impact Report*, Volume 1. May 12.; San Francisco State University, 2013. *Mitigated Negative Declaration: Recreation Wellness Center San Francisco State University*. January.; San Francisco Planning Department, 2012. *Executive Summary Modification of Conditions: 2800 Sloat Boulevard*. February 2.; San Francisco Planning Department, 2013. *Regional Groundwater Storage and Recovery Project: Draft Environmental Impact Report*, Vol. 1. April 10; San Francisco Planning Department, 2012. Letter of Determination: 800 Brotherhood Way. October 26.

E.1 Land Use and Land Use Planning

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
1. LAND USE AND LAND USE PLANNING— Would the project:					
a) Physically divide an established community?	☐	☐	☐	☒	☐
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐	☐
c) Have a substantial impact upon the existing character of the vicinity?	☐	☐	☐	☒	☐

Impact LU-1: The project would not physically divide an established community. (No Impact)

The project consists solely of construction activities within the project site. It would not include construction of new structures. Following soil remediation, the site would be restored to approximately current grade. Further, the project would not result in a change in access between adjacent land uses. Therefore, the project would not physically divide an established community and there would be *no impact*.

Impact LU-2: The project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. (Less than Significant)

Land use impacts are considered significant if the project would conflict with any plan, policy, or regulation adopted for the purpose of avoiding or mitigating and environmental effect. Environmental plans are those that directly address environmental issues and/or contain targets or standards that must be met in order to preserve or improve characteristics of San Francisco's physical environment.

As described in Section C, Compatibility with Existing Zoning and Plans, the project would not obviously or substantially conflict with applicable plans, policies, and regulations. Further, the project would comply with RWQCB Order R2-2013-0023 and all applicable environmental regulations. Therefore, the project would have a *less-than-significant* impact with regard to conflicts with existing plans, policies, and regulations.

Impact LU-3: The project would not have a substantial impact upon the existing character of the vicinity. (No Impact)

Impacts on existing land use character in the project vicinity could result if the project were to result in a long-term change in land use that would be incompatible or conflict with established land uses. The analysis of the project's effects on existing land use character includes consideration of the character of the proposed project relative to the existing land use context. An adverse effect could occur if a new use were placed next to an incompatible existing use, such that the basic function of either the existing use or the new use would be substantially impaired. For example, if a residential use were located next to a factory with toxic air emissions, either or both uses would be unable to function as intended.

The project would occur within lands zoned for public uses and owned by CCSF. The project does not propose any new permanent development or new or changed uses for the site; the project consists solely of the remediation of contaminated soils. Because the project would not change the existing land use, it would not introduce incompatible uses that would conflict with established land uses, and it would therefore have *no impact* upon the existing character of the vicinity.

Impact C-LU: The project, in combination with past, present, and reasonably foreseeable future projects in the vicinity would not result in significant cumulative land use impacts. (No Impact)

The geographic scope for potential cumulative land use impacts encompasses the areas along the shores of Lake Merced, which generally include open space and recreational areas, as well as the residential development across John Muir Drive to the south of the project site. The other cumulative projects within this geographic scope include the proposed update to the Significant Natural Resource Areas Management Plan (SNRAMP), the Vista Grande Drainage Basin Project, and the San Francisco Groundwater Supply Project. As discussed above, construction of the project could have a less-than-significant effect regarding conflicts with applicable land use plans, policies, and regulations. Similarly, the identified cumulative projects would also be required to comply with applicable land use plans, policies, and regulations adopted for the purpose of minimizing an environmental effect. Accordingly, no significant cumulative impact related to conflicts with applicable plans, policies and regulations would result from the cumulative scenario to which the proposed project and other cumulative projects would contribute (*no impact*).

E.2 Aesthetics

Topics:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*	*Not Applicable*
2. AESTHETICS—Would the project:					
a) Have a substantial adverse effect on a scenic vista?	☐	☒	☐	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and other features of the built or natural environment which contribute to a scenic public setting?	☐	☒	☐	☐	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☒	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area or which would substantially impact other people or properties?	☐	☐	☐	☒	☐

Impact AE-1: The project could have a long-term adverse effect on a scenic vista, scenic resources, or the existing visual character or quality of the site and its surroundings. (Less than Significant with Mitigation)

Designated Scenic Resources

The section below describes designated scenic resources located in the vicinity of the project site. There are no state designated scenic highways in San Francisco.[26] State Routes 1 and 35 are identified as eligible for designation as scenic highways, but the project would not be visible from these highways.

Locally Designated Roads. In 1938, San Francisco's Downtown Association created the 49-Mile Scenic Drive to highlight the city's beauty and to promote it as a tourist destination.[27] This scenic roadway encircles Lake Merced. Streets that comprise the 49-Mile Scenic Drive are recognized for their aesthetic value.

San Francisco General Plan. The urban design element of the San Francisco General Plan rates city streets as excellent, good, or average for the quality of their views. In the project area, John Muir Drive is rated as having excellent-quality street views. Lake Merced Boulevard is rated as having average-quality street views, with the exception of a small segment north of Brotherhood Way, where open views of Lake Merced are available; this segment is designated as having excellent-quality street views.

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26 California State Department of Transportation (Caltrans), *Map of Officially Designated Scenic Highways for the San Francisco County*, September 7, 2011. Available online at http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm. Accessed December 12, 2013.

27 San Francisco Convention and Visitors Bureau, *Official Visitors Website, San Francisco 49-mile Scenic Drive*. Available online at http://www.sanfrancisco.travel/maps/49-Mile-Scenic-drive.html?c=y&product=&showMain=. Accessed December 12, 2013.

The urban design element also identifies streets that are important to the "perception" of the city. John Muir Drive and Lake Merced Boulevard are identified as "Streets that Extend[s] the Effect of Public Open Space." The urban design element also identifies Lake Merced as an area where it is important to preserve the existing landscape.

Western Shoreline Area Plan. The Western Shoreline Area Plan, an area plan within the General Plan, is the CCSF's certified Local Coastal Program under the California Coastal Act of 1976. Policies related to the Lake Merced area include preserving recreational facilities, passive activities, playgrounds, and vistas of the Lake Merced area.

Visual Character and Quality of the Project Site and Surroundings

The visual study area for the project is the area from which the project site would come into view. Because the proposed project area is located beyond and adjacent to a heavily vegetated open space setting, trees and shrubs quickly restrict or block views of the project site as viewers move past the site; consequently, these elements limit the visual study area. Ten photos are included in this section to document the existing visual conditions of the project site and adjacent areas. **Figure 5** provides an overview of photo locations; **Figures 6a** through **6c** depict views of the project site and surrounding locations.

The visual study area includes the project site, Lake Merced, and associated open and recreational spaces in the vicinity of the project site. Lake Merced and adjacent areas are closely bounded by the major thoroughfares of Lake Merced Boulevard, John Muir Drive, and Skyline Boulevard. Aside from golf courses, the Lake Merced area is not highly manicured or landscaped, but it does not have an untouched natural setting due to the scattered presence of structures, utilities, and roads.

The project site, located along John Muir Drive, is in a particularly developed portion of the Lake Merced area. Nevertheless, the Lake Merced area is largely undeveloped, with trees, water, and vegetation providing visual variety and a respite from San Francisco's urban setting. Because many of the surrounding roadways and neighborhoods are elevated relative to Lake Merced, the lake and the bordering open space are also important visual resources, offering aesthetically pleasing views for motorists, bicyclists, and pedestrians.

Figures 6a through 6c depict views of the project site and surrounding locations. Photos 1 through 4 provide views of the project site and Lake Merced beyond from the pedestrian path along John Muir Drive; they depict views of the easternmost portion of the project area. This area includes a large amount of tree cover that mostly screens PRGC structures and two of the shooting ranges from public views.

Screening vegetation is less continuous west of the site entrance, but does screen large portions of the westernmost end of the site. Photos 5 through 8 show stretches of trees and shrubs, both within the project site and along John Muir Drive, that screen the site, and also show some areas that lack screening vegetation.

Photo 9 was taken from the Lake Merced boathouse docks, and Photo 10 was taken from the Lake Merced Boulevard pedestrian path, near the Lake Merced Pump Station. They show the project site as a developed and less vegetated area, compared to adjacent Lake Merced areas. They also show the Lakewood apartment complex in the immediate background and the well-developed tree cover beyond. From within the project site, views of Lake Merced and Harding Park are available from most areas of the site.

The project site is characterized by buildings, towers, shooting ranges, and parking areas and roads associated with the PRGC facilities. As described above, most of the boundary along John Muir Drive includes mature trees and shrubs. Vegetation along the site's lake side is low in profile or at a lower elevation than the site. This provides open long-range views of the site from the lake and from areas to the northeast and east. PRGC facility components, where visible from public areas, are perceptibly uncharacteristic of the surrounding area.

Public views of the project site from John Muir Drive, the adjacent pedestrian paths, and the bicycle lanes adjacent to John Muir Drive are intermittent and limited by the trees and shrubs that line the site. As noted above, long-range views of the site from the lake and public areas to the northeast and east are available to boaters, runners, bicyclists, and pedestrians. The 49-Mile Scenic Drive encircles the lake, and it can be reasonably assumed that users of the pedestrian path in particular expect a high-quality environment, given that the streets that comprise the 49-Mile Scenic Drive are recognized for their aesthetic value, as described above. In addition, John Muir Drive is rated as having excellent-quality street views, and as a street that extends the effect of public open space. Thus, these pedestrian path users, motorists, and bicyclists are considered sensitive viewers when considering the potential for aesthetic impacts. Nevertheless, the project site currently has low viewer exposure and is currently seen only briefly as viewers pass by (see Figures 6a through 6c).

Short-term Effects on Scenic Vistas, Scenic Resources, or the Existing Visual Character or Quality

Construction would last approximately one year and would involve the removal of surface debris, asphalt and concrete ground surfaces, trees, and miscellaneous range facilities, such as target launching houses, benches, and fencing. Site buildings, such as the clubhouse, rifle range building, trap house, and shell house, would be unaffected by site remediation.

Explanation

Approximate Limit of Soil Remediation

0 100
Feet

SOURCE: ESA, 2013

Pacific Rod and Gun Club . 120468.02

Figure 5
Photo Location Map

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Photo 1 - Northwest facing view from John Muir Drive Pedestrian Path


Photo 2 - North facing view from John Muir Drive Pedestrian Path


Photo 3 - East facing view from John Muir Drive Pedestrian Path

SOURCE: ESA

Figure 6a
Public Views of Pacific Rod and Gun Club


Photo 4 - Southeast facing view from John Muir Drive Pedestrian Path


Photo 5 - North facing view from John Muir Drive Pedestrian Path


Photo 6 - North facing view from John Muir Drive Pedestrian Path

SOURCE: ESA

Pacific Rod and Gun Club . 120468.02

Figure 6b

Public Views of Pacific Rod and Gun Club

Photo 7 - Southeast facing view from John Muir Drive Pedestrian Path

Photo 8 - East facing view from John Muir Drive Bicycle Lane

Photo 9 - South facing view from Lake Merced boathouse dock area

Photo 10 - West facing view from Lake Merced Boulevard Pedestrian Path

SOURCE: ESA

Pacific Rod and Gun Club . 120468.02

Figure 6c
Public Views of Pacific Rod and Gun Club

While the PRGC facilities are currently actively used three times a week, existing trees and vegetation screen views of the site and it is currently seen only briefly as viewers pass by. Following tree removal, exposed soil, construction vehicles, materials, and equipment on the site on a daily basis would temporarily increase the presence of unappealing visual features at the site. Affected viewers along John Muir Drive would likely notice construction activities as they pass the project site; however, their viewing period would be brief as they move past the site. Longer range views from the lake, or near the Lake Merced boathouse, may last longer in duration; however, construction activities would not necessarily be considerably more apparent than existing structures and activities as seen from a long range vantage point and distance (see photos 9 and 10 of Figure 6c), due to the intervening distance and the frequency of foggy or hazy conditions. Also, considering its relatively short duration, construction would not have a substantial adverse effect on scenic resources or the visual character or quality of the site and its surroundings. Therefore, the construction impacts on aesthetic resources would be *less than significant*.

Long-term Effects on Scenic Vistas, Scenic Resources, or the Existing Visual Character or Quality

As described above, the urban design element of the San Francisco General Plan identifies John Muir Drive and a small segment of Lake Merced Boulevard near Brotherhood Way as having excellent quality street views. The design element also values them as streets that extend the effect of public open spaces. This is primarily due to the unobstructed view of Lake Merced, which, in San Francisco's urban context, provides a unique and exemplary visual setting. Further, the roadways encircling Lake Merced are part of the 49-Mile Scenic Drive. The urban design element also identifies Lake Merced as an area where it is important to preserve the existing landscape.

While the project would not construct new facilities, it would remove trees that could increase views of the existing facility, and the lake beyond in some instances, from John Muir Drive. As shown in Figure 3, most of the trees in the easternmost portion of the site could be removed. As shown in the foreground of Photos 1 through 3 and in the middle ground of Photo 4, these trees predominantly screen views of the eastern portion of the site. While removal of the trees would provide longer range views of the lake beyond the site, it would also increase the visual presence of PRGC structures, parking areas, and driveways in the foreground. Because these features would be seen by pedestrians, bicyclists, and motorists along John Muir Drive, removing the trees would reduce the quality of the short-range views along this portion of the roadway. It would do this by introducing views of additional elements that are lacking in natural visual resource amenities, and that are relatively unappealing and perceptibly uncharacteristic of the of the open-space area around Lake Merced.

The SFPUC is considering retaining up to seven trees due to their proximity to existing buildings on the site. The visual effect of tree removal in this area would be reduced if these trees were retained. However, the potential to retain trees near structures has not been confirmed. Thus, removing the maximum potential number of trees in this vicinity could result in a substantial adverse effect on the scenic quality of the area and designated scenic resources. These include views from John Muir Drive/49-Mile Scenic Drive and of Lake Merced, and would result in a significant impact. However, this impact would be reduced to a less-than-significant level by implementing **Mitigation Measure M-AE-3, Screening Vegetation**, which requires planting trees and shrubs at the eastern end of the site. On maturation, replanted trees and shrubs would restore screening of the PRGC facilities at the easternmost end of the site; therefore, impacts on scenic vistas and scenic resources would be reduced to a *less-than–significant* level.

Mitigation Measure M-AE-3: Screening Vegetation.

The SFPUC shall identify the location and spacing of new plantings that would, at maturity, screen views of the eastern portion of the site. New plants shall include native species indigenous to the San Francisco Peninsula and/or shrubs and trees typical of the surrounding area. Plantings (by way of species type, size, and location) shall ensure that direct views of the site east of the entrance road are substantially obstructed from any location within a ten-year period. The SFPUC shall monitor and photograph screening vegetation annually after completion of remediation activities. If it is determined that success standards are not being met, SFPUC shall take immediate action to re-plant screening vegetation to ensure compliance by the tenth-year period.

As shown on Figure 3, trees 001 through 007, located to the west of the site entrance, would be removed. In this area, trees and shrubs along John Muir Drive would continue to screen views of the PRGC facilities from John Muir Drive. The stand of trees at the westernmost end of the PRGC site would also be removed (shown in the foreground of Photo 6). However, they are next to a stand of trees beyond the project site property line, so views towards the north, away from the site (Photo 6); and views towards the east, and into the site (Photo 7) would not be affected substantially. As a result, the impact on aesthetic resources located west of the site entrance would be *less than significant*.

Trees removed from around the perimeter of the site may be noticeable in long-range views from across South Lake (Photos 9 and 10). Removing these trees also may slightly open views of the Lakewood apartment complex to the south. However, given that the forested areas in the background would continue to dominate views, tree removal at the project site would not substantially change the visual quality or substantially affect Lake Merced as a scenic resource. As a result, the impact on aesthetic resources as viewed from across South Lake would be *less than significant*.

Impact AE-2: The project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. (No Impact)

There would be no substantial sources of light or glare associated with construction of the project that would adversely affect daytime views in the area; and there would be no nighttime construction. Following the excavation of contaminated soils and backfilling with clean fill material, the excavated areas would be compacted and graded to return the land to conditions similar to the site's existing ground contours. These areas would be hydroseeded for erosion control (see Section A.4.8, Backfilling and Site Restoration). Some of the existing paved areas would be replaced with a compacted permeable surface. Neither of these installed materials would constitute new sources of light or glare. Further, the project would not construct structures that could be new sources or light and glare. For these reasons, the project would have *no impact* with respect to daytime or nighttime light and glare.

Impact C-AE: The project, in combination with past, present, and reasonably foreseeable future projects in the vicinity would not result in significant cumulative aesthetics impacts. (Less than Significant)

Table 3 summarizes the present and reasonably foreseeable future projects in the vicinity of the project. The geographic scope for cumulative aesthetics impacts includes all projects that would be located within the publicly accessible viewshed of the proposed project. The cumulative project sites do not necessarily need to be visible simultaneously with the proposed project site from one fixed vantage point; however, for an impact to occur the sites must be visible in the same general vicinity by a viewer. Projects that could have a cumulative aesthetic impact in combination with the project, given their proximity, are the proposed update to the SNRAMP and the Vista Grande Drainage Basin Improvement Project.

The proposed update to the SNRAMP generally seeks to maintain or eventually improve the visual character of the Lake Merced area, so it would not likely contribute adversely to a permanent cumulative aesthetic impact. The Daly City Vista Grande Drainage Basin Improvement Project could remove vegetation and install treatment wetlands at the east end of John Muir Drive, near Impound Lake. A tunnel portal and an overflow structure located near the project site would be improved under the Vista Grande Project; however, the area of disturbance that would be visible in the same general vicinity as the proposed project would be small. Thus, the projects would not combine to create a significant adverse visual environment as compared to existing conditions and, therefore, the cumulative aesthetic impact of these projects considered together would be *less than significant*.

E.3 Population and Housing

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
3. POPULATION AND HOUSING— Would the project:					
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐	☐
b) Displace substantial numbers of existing housing units or create demand for additional housing, necessitating the construction of replacement housing?	☐	☐	☐	☒	☐
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒	☐

Impact PH-1: The project would not induce substantial population growth either directly or indirectly. (Less than Significant)

In general, a project would be considered growth-inducing if it would substantially increase population or new development that might not occur if the project were not implemented. The proposed project does not include the development of residences, additional roads, or infrastructure and therefore would not induce population growth. It is expected that the construction workforce requirements could be met using Bay Area labor and that construction employees would commute from elsewhere in San Francisco or the Bay Area, rather than relocate from more distant cities and towns. Although some workers might temporarily relocate from other areas, any population increase due to this relocation would be minor (fewer than 45 workers) and temporary (estimated at 12 months). The number of such employees would be minute compared to the total population and the available housing stock in San Francisco and the Bay Area; thus, it would not generate a substantial, unplanned population increase. Therefore, the project's growth-inducing impact would be *less than significant*.

Impact PH-2: The project would not displace substantial numbers of existing housing units or people, necessitating the construction of replacement housing. (No Impact)

The project site does not include existing housing or residential use. Therefore, the project would not displace existing housing or people, and as a result, there would be *no impact*.

Impact C-PH: The project, in combination with past, present, and reasonably foreseeable future projects, would not result in cumulative population and housing impacts. (No Impact)

The geographic scope of potential cumulative population and housing impacts encompasses San Francisco and the nearby vicinity. Potential project-specific population and housing impacts would be temporary and limited to the possibility of growth inducement related to the short-term relocation of construction workers.

Project construction could overlap with that of a number of cumulative projects listed in bold in Table 3. Construction of those projects could potentially induce growth to San Francisco or the Bay Area due to short-term construction worker relocation. This could contribute to potential impacts on population and housing resulting from short-term construction worker relocation. However, the number of construction workers seeking temporary relocation for employment is not anticipated to be substantial given the available construction workforce within commuting distance of San Francisco. Therefore, project construction, in conjunction with the other cumulative projects in the vicinity, would not induce substantial population growth, and there would be no significant cumulative impact on population and housing (*no impact*).

E.4 Cultural and Paleontological Resources

Topics:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Not Applicable*
4. CULTURAL AND PALEONTOLOGICAL RESOURCES—Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5, including those resources listed in Article 10 or Article 11 of the San Francisco *Planning Code*?	☐	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archeological resource pursuant to §15064.5?	☐	☒	☐	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐	☐

Impact CP-1. The proposed project could cause a substantial adverse change in the significance of a historical resource as defined in §15064.5, including those resources listed in Article 10 or Article 11 of the San Francisco Planning Code. (Less than Significant with Mitigation)

Approach

The PRGC was established at the project site in 1934 and has been in continuous use since this time, except for a brief hiatus during World War II. Because most of the buildings and structures on the site are more than 50 years old, the entire site was evaluated for its potential significance as a cultural landscape. ESA and its subconsultant, Denise Bradley Cultural Landscapes, completed architectural and historic landscape field surveys of the project site on September 19 and October 2, 2013. The results of the field surveys and associated research are provided in the following technical report: *Pacific Rod and Gun Club*

Draft Cultural Landscape Evaluation Report.[28] This report is presented as **Appendix A** (included on a CD in the pocket of printed copies of the PMND).

The cultural landscape evaluation assessed the potential eligibility of the PRGC site as a historical resource based on criteria established in the National Historic Preservation Act (NHPA) and for listing on the California Register of Historical Resources (CRHR). To be eligible for the CRHR, a historical resource must be significant at the local, state, and/or federal level under one or more of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage
- Is associated with the lives of persons important in our past
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history (PRC Section 5024.1[c]).

For a resource to be eligible for the CRHR, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. If the site appears eligible for listing on the National Register of Historic Places (NRHP) and CRHR as a cultural landscape, and retains sufficient integrity to convey this significance, it would be considered an historical resource as defined in CEQA Section 15064.5.

This section summarizes the findings of the evaluation of the significance of the PRGC site as a cultural landscape under the NRHP and CRHR criteria, including discussion of integrity, and evaluates project impacts in accordance with the CEQA Guidelines and the *Secretary of the Interior's Standards (Standards) for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (CEQA Section 15064.5[b]).[29]

Evaluation of the PRGC Site as a Historical Resource

The PRGC was identified as a cultural landscape that is eligible for listing in the NRHP and CRHR. A cultural landscape is defined as a geographic area shaped by human activity which can result from a conscious design or plan, or evolve as a byproduct or result of people's activities. It may be associated with a historic event, activity, or person or exhibit other cultural or aesthetic values. Of the four general types of cultural landscapes (historic sites, designed landscapes, vernacular landscapes, and ethnographic

[28] Denise Bradley, Cultural Landscapes, 2014. *Pacific Rod and Gun Club, San Francisco, CA, Cultural Landscape Evaluation Report*, May 2014.

[29] Weeks, Kay D., and Grimmer, Anne E., *Secretary of the Interior's Standards (Standards) for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings*, U.S. Department of the Interior, National Park Service, Cultural Resource Stewardship and Partnerships Heritage Preservation Services, Washington, D.C. 1995.

landscapes), the PRGC can best be described as a vernacular landscape—that is, one that has evolved through use by the people whose activities or occupancy shaped it and one in which function played a significant role. As described in NRHP bulletins on cultural landscapes, both the processes that helped to form the landscape and its individual components are critical to the understanding of a cultural landscape. The key processes to the formation of a cultural landscape include land uses and activities, patterns of spatial organization, responses to the natural environment, and cultural traditions. The individual components of a cultural landscape include groupings of features within a larger landscape, circulation-related features, the various types of boundary demarcations, vegetation features, buildings and structures, archaeological resources, and small-scale elements.[30] The description and evaluation of the PRGC site incorporates these cultural landscape characteristics and features.

NRHP/CRHR Criterion A/1 (association with the broad patterns of history)

The PRGC appears eligible for listing on the NRHP and CRHR at the local level of significance under Criterion A/1 for its association with the broad pattern of history related to the increased popularity of sport hunting and with the interrelated development of skeet, during the period in which it evolved from a type of shooting practice into a competitive sport. This occurred during the decades preceding World War II within the context of the early 20th century wildlife conservation movement. The PRGC is important as an example of the type of sportsmen's gun clubs that formed in the 1920s and 1930s within the context of the wildlife conservation movement. Additionally, the PRGC is important as the oldest extant skeet facility in the Bay Area and as the only sportsmen's club in the Bay Area to retain its original pre-World War II grounds configuration, skeet field structures, and club buildings. Other clubs that remain in operation from this pre-World War II era do not have skeet fields or have moved to new facilities. The period of significance for the PRGC's significance under Criterion A/1 appears to begin in 1934 when the club moved to the Lake Merced site and to end in 1941, with the United States' entry into World War II, which ended the club's initial period of development. Although the activities of the club remained unchanged after World War II, its post-war expansion period (1946-early 1960s) was more directly linked with other contexts than to the early 20th century wildlife conservation movement, such as the broad interest in outdoor recreation that occurred as a result of the nation's post-World War II prosperity and an increased interest in skeet that was a by-product of World War II training practices.

[30] United States Department of the Interior, National Park Service, 1999. *National Register Bulletin 30: How to Evaluate and Document Rural Historic Landscapes*. Prepared in 1989 by Linda Flint McClelland, J. Timothy Keller, ASLA, Genevieve P. Keller, and Robert Z. Melnick, ASLA. Revised in 1999. Washington, D.C.: NPS, 1999. Accessed 20 September 2013, http://www.cr.nps.gov/nr/publications/bulletins/nrb30/.

NRHP/CRHR Criterion B/2 (associations with important persons)

The research conducted for this evaluation did not reveal any associations with important individuals who made specific contributions to history; therefore, the PRGC does not appear to possess individual significance under NRHP/CRHR Criterion B/2 for its associations with important persons.

NRHP/CRHR Criterion C/3 (design and construction)

The PRGC site does not appear to possess individual significance under NRHP/CRHR Criterion C/3 for associations related to design or construction. The five skeet fields and three trap fields each individually meet the standard design or construction regulations for their respective sports and retain their essential individual features or components. However; each field is an individual common example of a skeet or trap field that lacks significance related to design or construction. Collectively, the target shooting range at the PRGC represents a vernacular example of the arrangement of skeet and trap fields adapted to the geographic limits of this site (a strip of land situated between the Lake Merced and a public road), does not appear to have been designed or built by a master designer, and lacks significance related to design or construction. The buildings on the site (the Clubhouse, the Caretaker's House, the Rifle Range building, the Shell House, and the Trap House) remain in their original locations and are important for the operational and social functions of the clubs; however, they are all are common examples of vernacular buildings and lack significance related to design or construction.

NRHP/CRHR Criterion D/4 (information about history or prehistory)

NRHP/CRHR Criterion D/4 commonly applies to properties that contain or are likely to contain information bearing on an important archaeological research question. The identification of, and potential effects on, archaeological resources is addressed in Impact CP-2, below.

Integrity. Integrity is the ability of a property to convey its significance. The evaluation of integrity is grounded in an understanding of a property's physical features and how they relate to its significance. Integrity is composed of seven components or aspects—location, design, materials, workmanship, setting, feeling, and association. As discussed above, for a resource to be eligible for the CRHR, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance.

The PRGC cultural landscape appears to exhibit all seven aspects of integrity in relationship to its individual significance under NRHP/CRHR Criterion A/1 in association the development of sportsmen's clubs and skeet within the context of the early 20th century wildlife conservation movement. The arrangement of the site, the four 1938 skeet fields, and the buildings of the PRGC from the 1934-1941 era still exist and are used as they were originally intended. Since 1941, the changes at the PRGC site did not substantially alter the facilities from that era, and were compatible with the continued use of the site as a sportsmen's club and outdoor target shooting range. These changes included the expansion of the skeet and trap fields (Fields 1, 2, 3, 8, and 9), the addition of a duck tower, the addition of a building related to the trap operations (the Trap House), the replacement of minor equipment related to these activities, and the addition of small utilitarian or support structures (the Barbeque Shed, the public restroom, a garage, and storage containers). There have been only minor alterations to some of the original buildings (the Clubhouse, the Caretaker's House, the Rifle Range building, and the Shell House) from the 1934-1941 era, such as changes to the windows and doors, as well as some accessibility improvements. For these reasons, the PRGC retains a sufficient degree of integrity to convey its historical significance.

Contributing and Non-Contributing Features. The features constructed on the PRGC property during its period of significance (1934-1941) and which relate to its significance under NRHP/CRHR Criterion A/1, for its association with the broad pattern of history related to the increased popularity of sport hunting and the development of skeet within the context of the early 20th century wildlife conservation movement, were identified as contributing features to the PRGC cultural landscape. The primary features from this period that contribute to the design of the PRCG cultural landscape and that remain in place include Fields 4 to 7, the broad terrace for these fields, the Clubhouse, the Caretaker's House, the Rifle Range building, and the Shell House.

Those features that: (1) may have been present during the period of significance but were not associated with the pre-World War II design or function of the site as an outdoor target shooting range/sportsmen's club (for example, vegetation); or (2) were added to the property after the end of its period of significance in 1941 (although in some cases these are compatible with its pre-World War II design or function as an outdoor target shooting range/sportsmen's club) were identified as non-contributing features.

These contributing and non-contributing features are described in more detail below.

The contributing features for the PRGC cultural landscape related to its significance under NRHP/CRHR Criterion A/1 for the period between 1934 and 1941 include the following:

Fields 4 to 7 (1938) and their character-defining features:

- a level terrace
- the linear arrangement of the fields
- the semi-circular path system of the skeet field (the form and dimensions, not the concrete materials)
- the high houses (wood frame tower structure, square in plan with a flat roof, clad in a combination of wood siding at the top and smooth stucco siding on the bottom, door that

provides access to the interior to allow loading and maintenance on the trap machinery, wood steps that provide access to this entrance door, and a window on the east side that provides an opening through which the targets are launched).[31]

- the low houses (wood frame tower structure, square in plan with a flat roof, clad in a combination of wood siding at the top and smooth stucco siding on the bottom, door that provides access to the interior to allow loading and maintenance on the trap machinery, and a window on the west side that provides an opening through which the targets are launched).[32]
- the safety fences (wood boards attached to opposite sides of the wood posts so that the position of the boards on one side alternates or is staggered with the ones on the other side)

The buildings that house the operational and social functions of the club:

- The Clubhouse (1937) and its character-defining features (wood-framed, raised single story structure with a rectangular footprint and cross gable roof, exposed eaves, and horizontal wood siding)
- The Caretaker's House (ca. 1937) and its character-defining features (wood-framed, single story structure with a rectangular footprint and gable roof, exposed eaves, horizontal wooden siding, gable ends with fish scale shingles [east side] and thin vertical wooden siding [west side], and original wood frame, double hung windows on the south, north, and west facades, and fixed wood shutters and entry shed on north facade)
- The Rifle Range building (1939) and its character-defining features (wood-framed, raised single story structure with a rectangular footprint and gable roof, exposed eaves, horizontal wood siding, wood frame, double hung, four-pane windows on the north, south, and west facades)
- The Shell House (ca. 1939, expanded in 1949) and its character-defining features (wood-frame, single story structure with a rectangular footprint and low pitch gable roof with exposed eaves, textured stucco cladding, raised porch, and a large, wood frame, fixed pane picture window on the western façade)

The non-contributing features for the PRGC cultural landscape that were constructed after the period of significance (1934 to 1941), or do not relate directly to its historic significance, include the following:

- Trap Fields 1 to 3, their associated features, and the Trap House
- Alterations to Fields 4 to 7 including the equipment shed behind station 4, the concrete paving, the target crossing point post positioned 10 feet north of station 8, and the trap houses (aligned with station 8) in the sloped area next to the lake
- Modifications on Field 6 for the five-stand game (the five stand racks, equipment shed behind stations 2 and 3, the equipment shed behind stations 5 and 6, the equipment shed in the sloped area next to the lake)
- Duck Tower

[31] The external siding on the high house on Field 4 has been remodeled since the end of the period of significance and the structure is now entirely clad in wood siding; however, the high house remains in its original location, retains all of its other character-defining features, and so it continues to retain its integrity.

[32] The external siding on the low house on Field 4 has been remodeled since the end of the period of significance and the structure is now entirely clad in wood siding; however, the low house remains in its original location, retains all of its other character-defining features, and so continues to retain its integrity.

- Fields 8 and 9, used for skeet, and their associated features
- The two landing posts used to calibrate the Olympic Skeet target machinery for Field 7 on the sloped area north of the field and the Rifle Range building
- The internal automobile circulations features (parking lot on the western end of the site and the internal road on the eastern end of the site) and concrete sidewalk between Fields 4 to 7 and the parking lot
- Small structures including the barbeque shed, the public restroom, the three-bay garage, and the storage containers
- Vegetation features
- Small scale features including the entrance sign, the flag pole and water fountain between the Shell House and the fields, site furnishings (benches, trash cans, picnic tables, lights, etc.), shotgun racks, token boxes, center point posts, trap portable scorer's stands, memorial field markers, the rifle pattern board, the fire hose, chain-link fencing, and the interpretive sign commemorating Rancho Merced (located adjacent to the Shell House)

As a site which appears eligible for listing on the NRHP and CRHR at the local level of significance under Criterion A/1 as a cultural landscape, and which retains sufficient integrity to convey this significance, it would be considered an historical resource as defined in CEQA Section 15064.5. Provided below is an assessment of project effects, as well as mitigation measures to reduce these effects to a less-than-significant level.

Project Effects

As described above, the PRGC site contains multiple features that contribute to its significance under Criterion A/1 as an historical resource. Some of these contributing features would remain in place, while others would be removed as a result of project implementation. This analysis evaluates the impact of project implementation on these contributory features in accordance with the CEQA Guidelines Section 15064.5(b) which define a substantial adverse change in the significance of an historical resource as follows:

> Physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired. Material impairment is further defined as demolishing or materially altering in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the CRHR or a local register of historical resources.

The four contributing buildings that house the operational and social functions of the club (Club House, Caretaker's House, Rifle Range Building, and Shell House) would remain onsite, and in their current location and condition. The high/low houses, which are also contributory to the cultural landscape, would be stored during construction. The semi-circular path system of skeet fields 4 – 7 and the safety fences, which are contributory to the cultural landscape, would be removed from the site. Removal of contributory features to the cultural landscape would result in a significant impact on the historical resource as defined above.

As noted in CEQA Section 15064.5(b)(3), a project that follows the *Secretary of the Interior's Standards (Standards) for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* shall be considered as mitigated to a less-than-significant level. Of the four treatment options offered by the Standards, the one that would apply to the proposed project would be Rehabilitation, which is defined as "the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values," generally referred to as the Secretary of Interior's Standards for Rehabilitation.

The Standards for Rehabilitation require that the historic character of a property be retained and preserved, and that the removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property be avoided. Repair is emphasized over replacement. Replacement of historic features is allowable under the Standards, however, the new features should match the old in design, color, texture, and, where possible, materials. The Standards recognize situations where replacement in-kind is not technically, economically, or environmentally feasible. In such situations, compatible substitute materials that have similar characteristics can be considered.

Project components that would comply, or partially comply, with the Standards include retention of the four contributory buildings on the project site, and the temporary relocation of the high/low houses, because they would retain and preserve some of the distinctive features that contribute to the cultural significance of the cultural landscape. However, there is no provision in the project description to relocate the high/low houses back to the skeet fields, or to protect the contributory buildings during construction from accidental damage or deterioration. If the high/low houses were not returned to their original locations, these distinctive features that contribute to the significance of the cultural landscape would be altered, which would contribute to causing a substantial adverse change to the historical resource as defined under CEQA Section 15064.5(b).

Project components that would not comply with the Standards include the permanent removal of the semi-circular station paths and wood safety fences at skeet fields 4 – 7, because they would remove or alter the distinctive features that contribute to the significance of the cultural landscape. This action would materially impair in an adverse manner these physical features of the historical resource.

Because portions of the project would not comply, or would only partially comply with the Standards, the project could have a significant impact on an historical resource as defined in Section 15064.5. However, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-CP-1a, Record and Reconstruct the Semi-Circular Station Paths at Skeet Fields 4 – 7**, **Mitigation Measure M-CP-1b, Record, Protect, and Return (or Replace in-Kind) the High/Low Houses and Wood Fences at Skeet Fields 4-7**, and **Mitigation Measure M-CP-1c, Protect the Four Contributory Buildings During Construction.** These measures would ensure that the features which contribute to the historic landscape of the PRGC are retained, protected and/or reconstructed in a similar size, design, location, and materials as existing, in keeping with the Secretary of Interior's Standards for Rehabilitation.

In addition, as discussed in Impact NO-2, in Section E.6, Noise, vibration from construction equipment used during excavation and backfilling could result in cosmetic or other damage to the four contributory buildings if large vibratory compactors or large earthmoving equipment were operated within 15 feet or 26 feet, respectively, of the buildings. **Mitigation Measures M-NO-2a, Preconstruction Surveys and Repair**, and **M-NO-2b, Construction Equipment Restrictions Near Buildings**, require that site buildings be inspected before and following site remediation to identify any damage caused by project activities and to repair such damage, and to restrict the use of large construction equipment near the Clubhouse, Caretaker's House, Rifle Range Building, Shell House. With implementation of these measures, the potential for vibration impact on contributory buildings would be *less than significant*.

Mitigation Measure M-CP-1a: Record and Reconstruct the Semi-Circular Station Paths at Skeet Fields 4 – 7.

The SFPUC or its contractor shall implement the following to comply with the Secretary of Interior's Standards for Rehabilitation:

- Prior to commencement of site remediation, the SFPUC shall record the original size, configuration, and locations of the semi-circular station paths at skeet fields 4 – 7 through the use of digital photography and mapping. The original dimensions and locations of the station paths shall be mapped on a site plan to aid the later reconstruction of these features.
- Following site remediation, the SFPUC shall reconstruct the semi-circular station paths which define skeet fields 4 – 7 in the same size, configuration, and location as the original station paths, including the level terrace and linear arrangement of the fields. As the existing concrete materials post-date the period of significance and are not character-defining, concrete may be substituted for other compatible materials (e.g. crushed rock, gravel, or wood boardwalks outlining the path configurations).

Mitigation Measure M-CP-1b: Record, Protect, and Return (or Replace in-Kind) the High/Low Houses and Wood Fences at Skeet Fields 4 – 7.

The SFPUC or its contractor shall implement the following measures to comply with the Standards for Rehabilitation:

- Prior to commencement of site remediation, the SFPUC shall record and document the existing structural condition and location of the wood frame high/low houses at skeet fields 4 – 7 (total of 8 structures) and the wood fences which separate these fields (total of 4 fences). This shall be accomplished through; 1) digital photography of all such features, 2) mapping their original locations and configuration on a site plan, and 3) numbering and cataloging each structure. These features shall be carefully relocated to a secure, onsite or off site location to avoid damage. If stored onsite, they may be relocated to alternate safety zones as remediation progresses. The most appropriate temporary relocation sites shall be determined by the SFPUC prior to commencement of work.

- During site remediation activities, the SFPUC shall protect these features from accidental damage during earth moving by storing these elements within a locked, chain-link fence enclosure and posting "Keep Out" or "No Trespassing" signs.
- Following site remediation, the SFPUC shall return these features to their original positions at the reconstructed skeet fields 4 – 7. Based on the pre-construction recording and depending on their structural condition, any damaged components should be repaired in keeping with the Secretary of Interior's Standards for Rehabilitation. If they were previously damaged beyond repair, they are in poor structural condition, or if it is infeasible to return them to their original location due to their condition or other factors, they may be replaced in-kind in a similar size, design, location, and materials as existing, in keeping with the Standards.

Mitigation Measure M-CP-1c: Protect the Four Contributory Buildings During Construction.

The SFPUC or its contractor shall implement the following measures to comply with the Standards for Rehabilitation:

- During site remediation activities, the four contributory buildings (Clubhouse, Caretaker's House, Rifle Range Building, and the Shell House), shall be adequately protected from accidental damage due to construction activities and vandalism. These structures shall be surrounded by protective fencing and shall be secured from entry by boarding up all windows and doors, and posting "Keep Out" or "No Trespassing" signs on each building. Following site remediation, these buildings shall be returned to their original appearance by removing all temporary construction fencing, window and door protection, and signage.

Mitigation Measure M-NO-2a: Preconstruction Surveys and Repair (see Section E.6, Noise, for description)

Mitigation Measure M-NO-2b: Construction Equipment Restrictions Near Buildings (see Section E.6, Noise, for description)

Impact CP-2: The project could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines, §15064.5. (Less than Significant with Mitigation)

Lake Merced was occupied at least seasonally during the prehistoric period. Several prehistoric sites (CA-SFR-25, CA-SFR-106, CA-SFR-181; an isolated discovery of a worked obsidian tool near CA-SFR-101H; and the Lake Merced prehistoric midden[33]) are documented within the project vicinity. Lake Merced has an

[33] A midden is any large refuse heap, mound, or concentration of cultural debris associated with human occupation. The term includes such materials as discarded artifacts, food remains, shells, bones, charcoal and ashes. Middens are valuable sources of archeological data.

abundance of freshwater biotic resources essential to and valued by Holocene epoch indigenous peoples. Because of this, researchers expect there to have been seasonal encampments focused on food and materials procurement in the area. They know the Lake Merced area had even more productive ecosystems during the thousands of years before the sand barrier blocked the former bay-estuary and formed the lake. Older prehistoric sites may lie buried or submerged under alluvial, sand dune, and marine deposits. No recent subsurface archeological field investigation has occurred in the Lake Merced area. Nearly all of the documented sites[34] are known merely from walk-over surveys or happenstance discoveries. Even in these cases, the recording archeologists made little effort to characterize the deposits.[35]

A sizeable prehistoric shell midden deposit, CA-SFR-181 (Ocean Beach Midden), has recently been recorded on the bluff overlooking Ocean Beach, approximately 1 mile northwest of the project site. The prehistoric deposit contains a range of shellfish types, predominantly mussel. Other dietary constituents included barnacle, clam, crab, and marine mammal. Also present are charcoal, lithic debitage (discarded material produced from the shaping of stone tools), and artifactual material, such as a possible shell bead. The sandy bluff that is the location of the prehistoric midden deposit is gradually eroding. Erosion has removed some unknown portion of the western part of the midden; its currently exposed portion measures 15 by 100 meters. Current knowledge of the shell midden suggests that it was not a long-term habitation site but was a seasonal camp or marine resource processing location. The fact that the five documented prehistoric “sites” in the Merced Valley (the Lake Merced watershed) are visible midden sites, despite the alterations that have occurred to historic land surface and landforms since the early 1800s, suggests that there could be a greater number of earlier prehistoric sites that are currently buried or submerged.

Nevertheless, in 1980, the firm Archeological Consultants completed an archeological field reconnaissance survey that included the project site, as part of a larger survey of the western Lake Merced area.[36] The project site may also have been included in an archeological field reconnaissance survey in 1976, but this has not been verified.[37] Regardless, no observations of potential archeological

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34 CA-SFR-25 (an isolate worked biface obsidian tool); CA-SFR-106 (shell midden deposit, mostly oyster, at ground surface and crossed by foot and horse trails); and the Lake Merced shell midden (a shell midden deposit visible at current grade). An additional prehistoric deposit may have been indicated in a geotechnical boring 5 feet bgs in 1977 in what was then the San Francisco Zoo’s Wolf Woods habitat in the zoo’s northeast corner near Sloat Boulevard. However, the consulting archeologist was not able to confirm it was of cultural origin. Recently discovered CA-SFR-181 (the Ocean Beach Midden) may be regarded as an exception, in that some constituent analysis, parameter, and condition assessment was made, and the site was recorded.

35 CA-SFR-106 was noted as a shell midden deposit composed chiefly of oyster shell remains extending over an area measuring 115 meters by 45 meters and having a depth of 40 to 70 centimeters bgs; the Environmental Planning Prehistoric GIS Archeo project noted, based on interviews and walk-over, that the shell midden deposit was in a sandy clay matrix.

36 Shoup, Laurence H., and Suzanne Baker, 1981. Cultural Resource Overview: Lake Merced Transport, San Francisco Clean Water Management Program. January 1981.

37 Dean, Randall, 2013. Environmental Planning Preliminary Archeological Review Checklist, Pacific Rod and Gun Club Remediation Program, Case No: 2012.1220E, October 2013.

deposits were made within the project site by the 1980 study, but the area was partially covered by pavement, gravel, and some structures. In 2012, AMEC completed intensive sampling for hazardous materials in soils of the project site.[38] Although not an archeological assessment by purpose or method, the study represents a good sampling of the soil profiles. AMEC completed 60 borings to the depth of anticipated excavation/removal of the 10-acre project site. Borings were advanced to depths ranging from 3 to 5 ft below ground surface in continuous cores using a direct-push drill rig with a Geoprobe dual-tube soil sampling system. No shell midden deposits or other indication of prehistoric occupation were described in the soil boring logs.

Based on the assessment described above, there is generally a low potential for uncovering archeological resources during project implementation. However, it is possible that previously unrecorded and buried (or otherwise obscured) archeological deposits could be discovered during project ground disturbing activities. Excavating, grading, and moving heavy construction vehicles and equipment could expose and have impacts on unknown archeological resources, which would be a significant impact. However, this impact would be reduced to a *less-than-significant* level with implementation of **Mitigation Measure M-CP-2, Accidental Discovery of Archeological Resources**. This requires that archeological resources be avoided and, if accidentally discovered, that they be treated appropriately.

Mitigation Measure M-CP-2: Accidental Discovery of Archeological Resources.

The following measures shall be implemented should construction activities result in the accidental discovery of a cultural resource:

> The following mitigation measure is required to avoid any potential adverse effect from the proposed project on accidentally discovered buried or submerged historical resources as defined in CEQA Guidelines Section 15064.5(a)(c). The project sponsor shall distribute the Planning Department archeological resource "ALERT" sheet to the project prime contractor; to any project subcontractor (including demolition, excavation, grading, foundation, etc. firms); or utilities firm involved in soils disturbing activities within the project site. Prior to any soils disturbing activities being undertaken each contractor is responsible for ensuring that the "ALERT" sheet is circulated to all field personnel including, machine operators, field crew, supervisory personnel, etc. The project sponsor shall provide the Environmental Review Officer (ERO) with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) to the ERO confirming that all field personnel have received copies of the Alert Sheet.
>
> Should any indication of an archeological resource be encountered during any soils disturbing activity of the project, the project Head Foreman and/or project sponsor shall immediately notify the ERO and shall immediately suspend any soils disturbing activities in the vicinity of the discovery until the ERO has determined what additional measures should be undertaken.

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38 AMEC, 2012. Supplemental Investigation and Health Risk Assessment Report, Pacific Rod and Gun Club, San Francisco, California. Prepared for City and County of San Francisco, California, April 2012.

If the ERO determines that an archeological resource may be present within the project site, the project sponsor shall retain the services of a qualified archeological consultant, based on standards developed by the Planning Department archeologist. The archeological consultant shall advise the ERO as to whether the discovery is an archeological resource, retains sufficient integrity, and is of potential scientific/historical/cultural significance. If an archeological resource is present, the archeological consultant shall identify and evaluate the archeological resource. The archeological consultant shall make a recommendation as to what action, if any, is warranted. Based on this information, the ERO may require, if warranted, specific additional measures to be implemented by the project sponsor.

Measures might include: preservation in situ of the archeological resource; an archeological monitoring program; or an archeological testing program. If an archeological monitoring program or archeological testing program is required, it shall be consistent with the Environmental Planning (EP) division guidelines for such programs. The ERO may also require that the project sponsor immediately implement a site security program if the archeological resource is at risk from vandalism, looting, or other damaging actions.

The project archeological consultant shall submit a Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archeological resource and describing the archeological and historical research methods employed in the archeological monitoring/data recovery program(s) undertaken. Information that may put at risk any archeological resource shall be provided in a separate removable insert within the final report.

Copies of the Draft FARR shall be sent to the ERO for review and approval. Once approved by the ERO, copies of the FARR shall be distributed as follows: California Archeological Site Survey Northwest Information Center (NWIC) shall receive one (1) copy and the ERO shall receive a copy of the transmittal of the FARR to the NWIC. The Environmental Planning division of the Planning Department shall receive one bound copy, one unbound copy and one unlocked, searchable PDF copy on CD three copies of the FARR along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources. In instances of high public interest or interpretive value, the ERO may require a different final report content, format, and distribution than that presented above.

Impact CP-3: The project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (Less than Significant with Mitigation)

Paleontological resources along the San Francisco Peninsula consist of the fossilized remains of plants and animals. These include vertebrates (animals with backbones) and invertebrates (animals without backbones, such as starfish, clams, ammonites, and marine coral), and fossils of microscopic plants and animals (microfossils). The age and abundance of fossilized remains depend on the location, topographic setting, and particular geologic formation in which the fossils are found. Fossil discoveries not only provide a historical record of past plant and animal life but can assist geologists in dating rock formations. Fossil discoveries can expand our understanding of the geologic periods and the geographic range of existing and extinct flora or fauna.

The Society of Vertebrate Paleontology (SVP) has established guidelines for identifying, assessing, and mitigating adverse impacts on nonrenewable paleontological resources.[39] Most practicing paleontologists in the United States adhere closely to the SVP's assessment, mitigation, and monitoring guidelines, which were approved through a consensus of professional paleontologists. Many federal, state, county, and city agencies have either formally or informally adopted the SVP's standard guidelines for mitigating adverse construction-related impacts on paleontological resources.

The SVP has helped define the value of paleontological resources. In particular, it indicates that geologic units of high paleontological potential are those from which vertebrate or significant invertebrate or significant suites of plant fossils have been recovered; that is, those that are represented in institutional collections. Sensitivity is determined based on two criteria: (1) the potential for yielding abundant or significant vertebrate fossils or a few significant fossils, large or small, that are vertebrate, invertebrate, plant, or trace fossils, and (2) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonic, biochronological, or stratigraphic data. Rock units that contain potentially datable organic remains older than late Holocene are also classified as having high potential. These units include deposits from animal nests or middens and units that may contain new vertebrate deposits, traces, or trackways.

Geologic units of low paleontological potential are those that are not known to have produced a substantial body of significant paleontological material. As such, the sensitivity of an area with respect to paleontological resources hinges on its geologic setting and whether significant fossils have been discovered in the area or in similar geologic units.

On the Peninsula and in San Francisco, most fossils are generally found along the Pacific Coast in marine units, such as the Purisima Formation, Monterey Formation, Butano Formation, Colma Formation, and Merced Formation. They are also found within the outcropping marine units in the Santa Cruz Mountains. Fossils found along the coast include vertebrates (e.g., extinct camels, horses, and sea mammals) and invertebrates (e.g., clams and corals). Fossil localities diminish along the eastern flank of the Santa Cruz Mountains, likely due to the presence of chaotically mixed and severely fractured Franciscan Complex bedrock and geologically younger alluvial deposits in the upland foothills.[40]

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39 Society of Vertebrate Paleontology (SVP), *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources*. http://vertpaleo.org/PDFS/24/2482305f-38f8-4c1b-934c-1022d264e621.pdf, accessed on November 9, 2013.

40 Fossils are rarely found in the Franciscan Complex bedrock of the Coast Range Province; any fossil remains originally present in the rock would not likely remain because the Franciscan Complex in this area is a chaotically mixed and fragmented mass of rock in a sheared matrix.

As discussed in Section E.14, Geology and Soils, the project site is located on the southwest shore of Lake Merced, next to the lake edge. Geologic units at the site include artificial fill closest to the lake edge and the Pleistocene-aged Colma Formation in the remainder of the project site.[41] The RAP further states that there is a mixture of range-related debris and sand at the ground surface, ranging in depths of 0.75 foot to 2.75 feet bgs.[42] The debris includes spent shotgun shells shot, and clay target fragments. Beneath this layer, the upper 1.5 to 3.5 feet of geologic materials generally consist of poorly graded sand to silty sand.

A search of the fossil collections database at the University of California Museum of Paleontology did not identify any vertebrate fossil localities within the Colma Formation in San Francisco.[43] However, vertebrate fossils, including parts of mammoths and bison, have been found in the Colma Formation in San Francisco, near the base of Telegraph Hill.[44] In addition, a mammoth tooth was discovered in the Colma Formation during excavation for the Transbay Transit Center in downtown San Francisco in 2012.[45] Because fossil remains of vertebrates have been found in the Colma Formation in two San Francisco locations, the Colma Formation is deemed to have a high potential to include paleontological resources for purposes of this analysis.

As proposed by the project, soil would be removed from depths of approximately 0.5 foot to 7 feet. Excavation of the artificial fill, which is present to depths of 0.75 foot to 2.75 feet, would not contain paleontological resources because it was not naturally deposited. However, the excavation would extend approximately 4 feet into the underlying Colma Formation in most portions of the 10-acre site. While there have been no fossil localities identified in the immediate project vicinity, as discussed above, the Colma Formation is considered to have a high paleontological sensitivity. Consequently, given the sensitivity of the formation and the large excavation area that could extend into the formation, the potential to encounter and adversely impact paleontological resources in the project site could result in a significant impact. This impact would be reduced to *less-than-significant* level with implementation of **Mitigation Measure M-CP-3, Accidental Discovery of Paleontological Resources**. This requires the remediation contractor to stop all ground disturbances within 50 feet if a paleontological resource is encountered during excavation and to implement actions to investigate the discovery and recover the fossil remains by a qualified professional, as appropriate, before ground disturbing activities can resume.

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41 Bonilla, M. G., Preliminary Geologic Map of the San Francisco South 7.5′ Quadrangle and Part of the Hunters Point 7.5′ Quadrangle, San Francisco Bay Area, California.

42 AMEC Environment & Infrastructure, Inc., 2013. Remedial Action Plan, Pacific Rod and Gun Club, San Francisco, California. July.

43 University of California Museum of Paleontology, collections database http://www.ucmp.berkeley.edu/science/collections.php, November 9, 2013.

44 Rodda, Peter U. and Nina Baghai, *Late Pleistocene Vertebrates from Downtown San Francisco*, California, Journal of Paleontology, Vol. 67, No.6 November 1993, pp. 1058-1063, http://www.jstor.org/discover/10.2307/1306122?uid=3739560&uid=2129&uid=2&uid=70&uid=4&uid=3739256&sid=21101675124861

45 Transbay Transit Center, Archaeology http://transbaycenter.org/project/archaeology, December 2, 2013.

Mitigation Measure M-CP-3: Accidental Discovery of Paleontological Resources.

The following measures shall be implemented should construction result in the accidental discovery of paleontological resources:

> To reduce the potential for the proposed project to result in a significant impact on paleontological resources, the SFPUC shall arrange for a paleontological training by a qualified paleontologist regarding the potential for such resources to exist in the project site and how to identify such resources. The training could consist of a recorded presentation that could be reused for new personnel. The training shall also include a review of penalties for looting and disturbance of these resources. An alert sheet shall be prepared by the qualified paleontologist and shall include the following:
>
> 1. A discussion of the potential to encounter paleontological resources;
> 2. Instructions for reporting observed looting of a paleontological resource; and instructions that if a paleontological deposit is encountered within a project area, all soil-disturbing activities in the vicinity of the deposit shall cease within 50 feet and the ERO shall be notified immediately; and,
> 3. Who to contact in the event of an unanticipated discovery.
>
> If potential fossils are discovered by construction crews, all earthwork or other types of ground disturbance within 50 feet of the find shall stop immediately until the qualified professional paleontologist can assess the nature and importance of the find. Based on the scientific value or uniqueness of the find, the paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the fossil. The paleontologist may also propose modifications to the stop-work radius based on the nature of the find, site geology, and the activities occurring on the site. If treatment and salvage is required, recommendations shall be consistent with SVP 1995 guidelines and currently accepted scientific practice, and shall be subject to review and approval by the ERO or designee. If required, treatment for fossil remains may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection, and may also include preparation of a report for publication describing the finds. The SFPUC shall be responsible for ensuring that treatment is implemented and reported to the San Francisco Planning Department. If no report is required, the SFPUC shall nonetheless ensure that information on the nature, location, and depth of all finds is readily available to the scientific community through university curation or other appropriate means.

Impact CP-4: The project could disturb human remains, including those interred outside of formal cemeteries. (Less than Significant with Mitigation)

The project is subject to the provisions of California Health and Safety Code, Section 7050.5, with respect to the discovery of human remains. The PRC, Section 5097.98, regulates the treatment and disposition of human remains encountered during project grading and construction.

Although no known human burials have been identified within the project site or general vicinity, the possibility of encountering human remains cannot be entirely discounted. Earthmoving associated with project construction could directly affect previously undiscovered human remains. Therefore, the potential impact regarding disturbance to human remains could be significant. However, this impact would be reduced to a *less-than-significant* level with implementation of **Mitigation Measure M-CP-4, Accidental Discovery of Human Remains.** This requires avoidance measures or the appropriate treatment of human remains if any are accidentally discovered during project implementation.

Mitigation Measure M-CP-4: Accidental Discovery of Human Remains.

The following measures shall be implemented should construction activities result in the accidental discovery of human remains and associated cultural materials:

> The treatment of human remains and of associated or unassociated funerary objects discovered during any soil-disturbing activities shall comply with applicable state laws. This shall include immediate notification of the coroner of the county within which the project is located and, in the event of the coroner's determination that the human remains are Native American, notification of the California Native American Heritage Commission, which shall appoint a most likely descendant (MLD) (PRC Section 5097.98). The archeological consultant, SFPUC, and MLD shall make all reasonable efforts to develop an agreement for the treatment, with appropriate dignity, of human remains and associated or unassociated funerary objects (CEQA Guidelines Section 15064.5[d]). The agreement should take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. The PRC allows 24 hours to reach agreement on these matters. If the MLD and the other parties do not agree on the reburial method, the SFPUC shall follow Section 5097.98(b) of the PRC, which states that "the landowner or his or her authorized representative shall reinter the human remains and items associated with Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance."

Impact C-CP: Construction of the project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, could result in a significant cumulative impact on cultural resources (Less than Significant with Mitigation).

The geographic scope of potential cumulative impacts on archeological resources, paleontological resources, and human remains encompasses the project area and nearby vicinities. All cumulative projects identified in the vicinity (see Table 3) are assumed to cause some degree of ground disturbance during construction and thus contribute to a potential cumulative impact on buried cultural resources.

Background research suggests that the potential to encounter archeological resources, paleontological resources, or human remains would be low; however, the proposed project would have the potential to affect unknown resources should they be present in the project area. In combination with the other identified cumulative projects, the potential for a cumulative impact would be significant without mitigation. With implementation of **Mitigation Measures M-CP-2, Accidental Discovery of Archeological Resources, M-CP-3, Accidental Discovery of Paleontological Resources**, and **M-CP-4, Accidental**

Discovery of Human Remains, the proposed project's contribution to the potential cumulative impact would be less-than-cumulatively considerable with mitigation (*less than significant with mitigation*).

The analysis of cumulative impacts related to historical resources evaluates whether the impacts of the proposed project, together with the impacts of cumulative development, would result in cumulatively significant impacts on the historical resource described above, namely the contributing features of the PRGC cultural landscape. The geographic scope of potential cumulative impacts on historical resources encompasses the project site and nearby areas which could cause direct or indirect effects on this historical resource. Nearby projects, such as the Vista Grande Drainage Basin Improvement Project and the SNRAMP, are not anticipated to cause or contribute to impacts on the historical resource, as these projects would not alter the physical characteristics that convey the PRGC site's historical significance. Further, with implementation of **Mitigation Measure M-CP-1a, Record and Reconstruct the Semi-Circular Station Paths at Skeet Fields 4 – 7**, **Mitigation Measure M-CP-1b, Record, Protect, and Return (or Replace in-Kind) the High/Low Houses and Wood Fences at Skeet Fields 4-7**, and **Mitigation Measure M-CP-1c, Protect the of Four Contributory Buildings During Construction**, the less-than-significant impact of the proposed project alone would not be sufficiently substantial to cause a significant, adverse, cumulative effect. Therefore, the cumulative impact on historical resources would be less-than-cumulatively considerable with mitigation (*less than significant with mitigation*).

E.5 Transportation and Circulation

Topics:		*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Not Applicable*
E.5.	**TRANSPORTATION AND CIRCULATION— Would the project:**					
a)	Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☒	☐	☐	☐
b)	Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☐	☒
c)	Result in a change in air traffic patterns, including either an increase in traffic levels, obstructions to flight, or a change in location, that results in substantial safety risks?	☐	☐	☐	☒	☐

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses?	☐	☐	☒	☐	☐
e) Result in inadequate emergency access?	☐	☐	☒	☐	☐
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☒	☐	☐	☐

The project site is located in the City and County of San Francisco, which has established level-of-service (LOS) standards and a congestion management plan (CMP) that are intended to monitor and address long-term traffic impacts due to future development but which do not apply to temporary impacts associated with construction projects. There are no operations and maintenance activities included in the project, and therefore, the project would not generate long-term traffic, and consideration of LOS impacts on CMP roadways or local roadways during operation of the project components is not applicable. Therefore, significance criterion 5b above is *not applicable* and is not discussed further.

The study area for transportation and circulation consists of a network of regional and local roadways primarily next to or near Lake Merced, and roadways affected by project construction-related vehicles and related activities. These roadways are John Muir Drive, Lake Merced Boulevard, SR 1 (the Great Highway), SR 35 (Skyline Boulevard), and I-280. Traffic counts were conducted on John Muir Drive and Lake Merced Boulevard during a 72-hour, midweek period (Tuesday, Wednesday, Thursday) in November 2013 to identify the weekday average daily traffic (ADT) volumes along these roadways. Based on these recent counts, the ADT along John Muir Drive is about 8,000 vehicles, and the ADT along Lake Merced Boulevard is about 17,500 vehicles.[46] The most recent data published by the Caltrans indicates that the annual average daily traffic (AADT) on SR 1 near the project site is about 94,000 vehicles.[47] In addition, recent data published by Caltrans indicates the AADT on SR 35 near the project site is about 27,500 vehicles, and the AADT on I-280 near the project site is about 135,000. These roadways would be used by construction workers and operators of other construction vehicles, including trucks transporting construction equipment and materials and accessing the site for remediation (e.g., site preparation, survey and excavation layout, soil excavation and removal, backfilling, and site restoration).

46 CHS Consulting Group, 2013. *72-Hour Machine Traffic Counts.*

47 California Department of Transportation (Caltrans), *2012. Traffic Volumes on California State Highways.* http://traffic-counts.dot.ca.gov/index.htm. Accessed November 7, 2013.

MUNI provides bus service near the project area. The #18 (46th Avenue) bus line operates along John Muir Drive and Lake Merced Boulevard. It provides weekday and weekend bus transit service between the Palace of the Legion of Honor (in Lincoln Park) and Stonestown Shopping Mall (at 19th Avenue and Winston Drive). MUNI bus stops for the #18 (46th Avenue) line are next to and near the project site; there is a bus stop is across the street from the driveway entrance to the project site and another approximately 600 feet west of the driveway entrance, along the east side of John Muir Drive.[48] The San Mateo County Transit District (SamTrans) also provides bus transit service near the project site. The SamTrans Route 122 provides weekday and weekend service between the Colma BART station and the Stonestown Shopping Mall. There are bus stops along both sides of Lake Merced Boulevard, immediately south of Brotherhood Way, and near the surface parking lot on the east side of Lake Merced.[49]

In general, roadways that would be affected by construction have pedestrian facilities, including raised concrete sidewalks, striped crosswalks, and curb ramps at intersections. Bicycle facilities are classified as Class I (bicycle paths separated from roads), Class II (striped bicycle lanes within the paved areas of roadways), or Class III (designated and signed bicycle routes where cyclists share the street with vehicles). A Class I designated multi-use pathway (Citywide Bicycle Route 885) and Class III bicycle route (Citywide Bicycle Route 85) run next to John Muir Drive and Lake Merced Boulevard.[50] The two bicycle routes share the same alignment along Lake Merced and run along Lake Merced Boulevard, John Muir Drive, and SR 35 and back to Lake Merced Boulevard; however, Route 885 deviates from the lake at the north end and is routed via Middlefield Drive, Gellert Drive, Clearfield Drive, Ocean Avenue, and the pathway just west of Sunset Boulevard back to Lake Merced Boulevard.

The transportation impacts identified below allow for a general assessment of the nature and magnitude of potential impacts from planned construction phases of the project. The final construction scheduling of specific facilities could result in traffic impacts from sequential or concurrent (or overlapping) construction activities. Thus, traffic generation is described for individual phases and for potential concurrent construction activities during a particular construction phase. Because most of the transportation impacts from construction would be specific to the project site, they would be limited to project-generated traffic on roads used to access the project site.

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48 MUNI #18 46th Avenue Bus Transit Timetable. http://transit.511.org/schedules/index.aspx?#m1=S&m2=bus&routeid=43915&cid=SF. Accessed November 4, 2013.

49 SamTrans Route 122 Bus Transit Timetable. http://www.samtrans.com/schedulesandmaps.html. Accessed November 7, 2013.

50 Citywide Bicycle Network and classifications established in the City of San Francisco Bicycle Plan (June, 26, 2009). http://www.sfmta.com/sites/default/files/projects/San_Francisco_Bicycle_Plan_June_26_2009_002.pdf. Accessed November 4, 2013.

As stated above, the project would not require any long-term maintenance or monitoring of the site after remediation. No new structures would be constructed as a part of the project, and all existing buildings would remain. Therefore, there would be no increase in vehicle trips to the site once construction is completed. Because the project would not result in an increase in long-term trips relative to existing conditions, impacts on traffic congestion on affected roadways post-construction are not included in the assessment of transportation impacts. Instead, the analysis focuses solely on the effects on the surrounding transportation and circulation network during project construction, as discussed below.

Impact TR-1: The project could conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit. (Less than Significant with Mitigation)

As described in Section A, Project Description, the SFPUC proposes to remediate upland soil contamination at the project site. As such, it would coordinate with, and be guided by, the goals and policies established in the CCSF's General Plan.[51] Furthermore, the applicability of the General Plan to transportation and circulation are embedded within its transportation element. Specifically, the transportation element contains objectives and policies that relate to the nine aspects of the citywide transportation system: general needs, regional transportation, congestion management, vehicle circulation, transit, pedestrian, bicycles, citywide parking, and goods management. Specific policies that are applicable to the project are ensuring the safety and comfort of pedestrians throughout the city (Policy 1.2); designating expeditious routes for freight trucks and minimizing conflicts with automobile traffic (Policy 6.1); and establishing and maintaining truck routes to enhance truck access and to clearly and visibly attract truck traffic away from residential neighborhoods (Policy 39.1). In addition, the Transportation Element references the CCSF's Transit First Policy. This is a set of principles that underscore the CCSF's commitment that transit, bicycle, and pedestrian travel be given priority over travel by private automobile.

The San Francisco General Plan also includes policies specific to Lake Merced, set forth in the Western Shoreline Area Plan. These policies are to preserve a safe, attractive, and usable condition of recreation facilities in the Lake Merced area for the enjoyment of citizens and visitors (Objective 5, Policy 5.1) and to maintain a recreational pathway around the lake designed for multiple use (Objective 5, Policy 5.2).[52]

The San Francisco General Plan also embodies policies set forth in the San Francisco Bicycle Plan which describes a program to provide the safe and attractive environment needed to promote bicycling as a

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51 City and County of San Francisco, General Plan, 1995. http://www.sf-planning.org/ftp/general_plan/index.htm. Accessed November 4, 2013.

52 City and County of San Francisco (CCSF), *San Francisco General Plan, Transportation Element*, adopted July 1995.

transportation mode within the city.[53] As presented in the Bicycle Plan, the only bicycle improvement project planned in the project area was installing Class II bicycle lanes along John Muir Drive, between Lake Merced Boulevard and Skyline Boulevard (Project 8-4). This bicycle project has been completed.

In addition to these local policies, the SFPUC would be required to adhere to federal regulations outlined in Title 49, Code of Federal Regulations (CFR). These address safety considerations for transporting goods, materials, and substances and govern the transportation of hazardous materials, including the types of materials and the marking of the transportation vehicles.[54] On a statewide level, any state facilities that are used as access routes by construction workers and construction vehicles are subject to Caltrans regulations. Caltrans requires that permits be obtained for transporting oversized loads and certain materials and for construction-related traffic disturbance.[55] State highways that construction vehicle operators are likely to use as access routes to the project site are SR 1, SR 35, and I-280.

Because the project could increase traffic along area roadways and could disrupt traffic during construction, the SFPUC or its contractor would be required to implement a construction management plan as part of the SFMTA's Transportation Advisory Staff Committee (TASC) process. The SFPUC or its contractor would coordinate with the appropriate jurisdictional agencies through the Street Construction Coordination Center of the SFDPW and the TASC. As required by the SFMTA *Blue Book* regulations, the construction management plan would, at a minimum, include the following provisions:

- Circulation routes shall be developed to minimize impacts on local street circulation during lane closures, as appropriate. In the event of lane closures, flaggers or signs or both shall be used to guide vehicles through or around the construction zone. Roadside construction safety protocols shall be implemented.
- Truck routes designated by the CCSF shall be identified. Haul routes that minimize truck traffic on local roadways and residential streets shall be used to the extent possible.
- Sufficient staging areas shall be developed for trucks accessing construction zones so as to minimize disruption of access to adjacent land uses, particularly at entries to the project site.
- Construction vehicle movement shall be controlled and monitored by onsite inspectors enforcing standard construction specifications.
- Truck trips shall be scheduled outside the peak morning and evening commute hours, to the extent possible.

53 San Francisco Bicycle Plan http://www.sfmta.com/sites/default/files/projects/San_Francisco_Bicycle_Plan_June_26_2009_002.pdf.

54 49 CFR: Transportation. Office of the Secretary of Transportation http://www.ecfr.gov/cgi-bin/text-idx?SID=f887e38a370ccbfc57574d0c9bf0cb9c&tpl=/ecfrbrowse/Title49/49tab_02.tpl. Accessed November 4, 2013.

55 Caltrans, 2012. California Manual on Uniform Traffic Control Devices for Streets and Highways. Amended January 13, 2012.

- Pedestrian and bicycle access and circulation shall be maintained during project construction where it is safe to do so. The contractor shall be required to maintain bicycle lanes and lane widths to accommodate bicycle traffic; alternatively, the contractor shall seek a permit from the SFMTA to address bicycle route detours and signs for any lane closures, as appropriate. Where construction encroaches on a bicycle lane, advance warning signs (e.g., "Bicyclists Allowed Use of Full Lane" and "Share the Road") shall be posted to indicate that bicycles and vehicles are sharing the lane and to warn bicyclists and drivers of upcoming traffic hazards. If construction encroaches on a sidewalk, safe crossings and appropriate signs shall be provided for pedestrians.

- All equipment and materials shall be stored in designated contractor staging areas on or next to the worksite, such that traffic obstruction is minimized.

- Construction shall be coordinated with facility owners or administrators of police and fire stations (including all fire protection agencies) and transit stations or stops. Emergency service vehicles shall be given priority for access.

- The contractor shall be encouraged to reduce the number of construction workers' vehicle trips by facilitating the use of public transportation and minimizing construction worker parking availability.

Construction Activities

Site remediation would consist of site preparation, survey and excavation layout, soil excavation and removal, confirmation sampling, waste disposal, backfilling, and site restoration. Entrance to and exit from the project site would be via the existing driveway. A temporary (secondary) access point to the site may be constructed along John Muir Drive to better circulate truck traffic during construction; however, the need for and location of secondary access has not yet been determined.

Staging areas for equipment and material stockpiling would be onsite and within appropriate construction or exclusion zones; there would be no staging on public rights-of-way (e.g., adjacent streets or sidewalks) or private properties. Because construction would occur in multiple areas within the site, staging areas would be relocated as remediation progresses. Temporary fencing would be installed at each staging area and in construction zones to maintain security at the site and prevent trespassing.

The duration of construction would vary depending on each phase; however, the total estimated construction period is approximately 57 weeks, proposed to begin in January 2015 and to be completed in early 2016. Construction is expected to occur primarily from 7:00 a.m. to 6:00 p.m., Monday through Friday; no nighttime or weekend construction is anticipated. Because project construction would not occur within public roadways or travel lanes, the project would not reduce the roadway capacity on roads that provide access to the project site. However, on-street parking spots along John Muir Drive next the site entrances would be temporarily restricted during construction. This would be to provide adequate access for haul trucks and to reduce any potential conflicts with the owners of parked vehicles and other users of the roadway.

As shown in Table 2 in Section A, Project Description, the required construction equipment would vary during different phases of construction. Most equipment would be transported to the project site and would remain there. However, the project would require 20-cubic-yard dump trucks, flat-bed delivery trucks, and pickup trucks that would generate external trips to and from the project site daily. Similarly, the project would require an average workforce ranging from 15 to 30 construction workers, depending on the particular phase of construction. Construction activities would generally be sequential, as site preparation would occur before any removal of debris, concrete pads, or vegetation. The site would be restored after excavation and backfilling. Although most construction phases would occur sequentially, excavation and backfilling would generally occur concurrently over a 48-week period (see Table 2) and would require a higher number of construction workers and haul trucks.

As described in Section A, Project Description, the SFPUC has established standard construction measures to be included in all construction contracts.[56] Before construction, the SFPUC would provide a 10-day-advance public notice describing project construction activities, schedule information, anticipated effects, such as temporary closure of street parking spaces, and contact information. The notice would be distributed to adjacent properties and included on the SFPUC website, along with project information.

Construction-Related Vehicle Trips

Construction activities associated with the project would result in short-term increases in worker and haul truck vehicle trips on area roadways. The number of construction-related vehicle trips would vary each day, depending on the type of project component, construction phase, planned activity, and material needs. Furthermore, because certain construction activities could occur simultaneously within each phase of the project (e.g., excavation and backfilling), they could overlap during the same period, thereby increasing overall traffic volumes along affected roadways.

Worker Vehicle Trips. As stated above, the anticipated construction activities would require an average of between 15 and 30 construction workers a day at the project site. However, during concurrent excavation and backfilling, over a 48-week period, up to 45 construction workers would be traveling to and from the project site. Although construction worker travel mode is unknown, for this analysis it was assumed that all workers would travel to and from the project site in their own vehicles. Based on these estimates and assumptions, the project would generate a maximum of 56 construction worker weekday round-trips (112 one-way vehicle trips) and an average of 20 to 40 construction worker round-trips (40 to 80 one-way vehicle trips).[57]

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56 SFPUC, 2007. Standard Measures to be Included in Construction Contracts and Project Implementation. February 7, 2007.

57 The total round-trip and one-way construction worker vehicle trips were multiplied by a factor of 1.25 to account for any miscellaneous midday trips during a typical work day.

Haul Truck Trips. The number of construction-related haul truck trips per day would vary depending on the type of construction technique, the volume of spoils and fill, and the pace of work. As presented in Section A, Project Description, excavation would require disposing of excess spoils, which would be loaded into trucks and transported offsite to an approved landfill. Backfilling would also require trucks to import clean fill to the project site. Excavated and backfill materials would be transported to and from the project site using 20-cubic-yard haul trucks.

Approximately 50 haul trucks would be required to deliver equipment and related machinery to and from the project site during the construction period. Some equipment transported to the site would remain throughout the entire construction period; however, other equipment may be transported or removed from the site during specific phases. Based on these estimates, the project could generate up to one delivery truck trip on a given weekday.

The project would generate approximately 4,650 truck trips, 2,325 truck trips for off-hauling excavated materials and 2,325 truck trips for importing new fill. Because excavation and backfilling would be conducted simultaneously and spread over 48 weeks (approximately 240 days), the total number of daily truck trips would equate to about 20 per day (40 one-way trips per day).[58]

Table 4, below, presents the number of construction-related vehicles generated by the project for each construction phase and duration. As shown, the project would generate a maximum of about 76 vehicle trips a day (152 one-way trips), including both construction workers and haul trucks, during concurrent construction activities (for example, if soil washing or stabilization is performed, it would be conducted concurrently with excavating and backfilling) and fewer daily vehicle trips during sequential activities.

Increased Traffic Impacts

The LOS standards established by the San Francisco Planning Department are intended for evaluating traffic impacts from added vehicle trips during project operation; these standards are generally not applicable to construction-related vehicle traffic. Because project construction and effects on intersection operations would be temporary, an LOS analysis for construction is not required. Furthermore, there are no operations and maintenance activities included in the project; therefore, it would not generate long-term traffic.

58 For every truck load, there would be two one-way trips. For example, an off-haul truck would leave the project site loaded with excavated material and would return the site empty (to be reloaded).

TABLE 4
WEEKDAY CONSTRUCTION VEHICLE TRIP GENERATION

Activity	Duration	Construction Worker Trips[a]		Haul Truck Trips[c,d]	
		Round-Trip	One-Way	Round-Trip	One-Way
Sequential Activity					
Site preparation	2 weeks	10–15	20–30	0	0
Utility identification and removal	1 week	10–15	20–30	0	0
Removal of debris, pads, and trees	2 weeks	15–20	30–40	0	0
Site and surface restoration	4 weeks	15–20	30–40	0	0
Maximum (peak) vehicle trips per day[b]	-	25	50	±1	±2
Concurrent Activity					
Excavation and backfilling	48 weeks	25–30	50–60	20	40
Soil washing or stabilization		10–15	20–30		
Maximum (peak) vehicle trips per day[b]	-	56	112	20	40

[a] The range of daily workers (and worker vehicle round-trips), assuming all workers would travel to and from the project site in their own vehicles.
[b] The maximum (peak) round-trip and one-way construction worker vehicle trips were multiplied by a factor of 1.25 to account for any miscellaneous midday trips during a typical work day.
[c] The total number of haul trucks over the construction period for each project component assumes that the capacity of haul trucks would average 20 cubic yards of material. This is based on the estimated quantities of spoils and structural fill material presented in Section A.4.8, Project Description.
[d] The project would generate approximately 50 truck trips to deliver equipment throughout the construction period, which would equate to less than one truck trip per day.

SOURCE: CHS Consulting Group 2013

The addition of construction traffic to the current roadway volumes, without increasing roadway capacity, could increase congestion and delays for vehicles, including public transit. The impact of construction vehicle traffic on local and regional roadways would vary by time of day, number and type of construction-related vehicles, number of travel lanes on the affected roadways, and existing traffic volumes on these roadways. The presence of construction trucks, with their slower speeds and larger turning radii, could result in some vehicle delays and congestion. Impacts from construction traffic would be most noticeable on roadways in the immediate vicinity of the project work sites. Impacts would be less noticeable on higher-capacity regional roadways, on local roadways farther from the site (as project trips disperse over the road network), and on regional roadways. In addition, because construction activities would occur simultaneously within each phase of the project (e.g., excavating and backfilling), such activities could compound traffic volumes and could worsen traffic conditions along affected roadways. However, the current schedule for project work during each phase indicates excavation and backfilling would occur concurrently, whereas other phases would occur sequentially.

Construction would occur primarily from 7:00 a.m. to 6:00 p.m., Monday through Friday. Workers would travel to the project site before the morning peak traffic period of 7:00 a.m. to 9:00 a.m.; trips from the project site would occur after the evening peak traffic period of 4:00 p.m. to 6:00 p.m. Truck trips would be spread over the course of the 11-hour work day. Traffic associated with concurrent construction activities at the project site would represent less than one percent of existing traffic volumes on the regional roads, SR 1, SR 35, and I-280. This is based on the estimated traffic generation for each phase of construction (see Table 4), the current project schedule, and the reasonable assumption is that workers' residences would be spread among Bay Area cities and worker vehicles and haul trucks would be dispersed on different roads. Project-related traffic would be more noticeable on local roads next to the project site; however, construction activities at the project site would represent two percent of existing traffic volumes along John Muir Drive and less than one percent of existing traffic volumes on Lake Merced Boulevard. Based on these findings, impacts from a temporary increase in traffic volumes on area roadways would be *less than significant.*

Public Transit Impacts

The project would not create new transit trips that could affect existing transit demand or transit service near the project site. Discussed below are the potential conflicts between project-related vehicles and transit vehicles, along with construction-related impacts.

With respect to project construction effects on existing bus transit services, as described above, the short-term traffic increases that would occur on local roadways during project construction would not substantially disrupt transit service. Similarly, construction activities would not temporarily or permanently eliminate access to nearby bus transit stops along John Muir Drive and Lake Merced Boulevard. The temporary influx in haul trucks traveling to and from the project site may result in marginal delays for buses; however, any disruptions to local bus service along affected streets would be temporary, affecting only the immediate area of the project site. Furthermore, the project would not result in the re-routing of existing transit lines. Based on these findings, impacts on public transit and its users would be *less than significant*.

Pedestrian and Bicycle Impacts

The project would not create new pedestrian or bicycle trips that could affect bicycle or pedestrian facilities in the project area, primarily Citywide Bicycle Route 85, along John Muir Drive and Lake Merced Boulevard, and with Citywide Bicycle Route 885, the multi-use pathway that runs along Lake Merced. Additionally, the project would not permanently impede pedestrian and bicycle access, nor would it result in overcrowding of, or increased demand for, pedestrian and bicycle facilities. Discussed below are the potential conflicts between project-related vehicles and pedestrians and bicyclists and the construction-related impacts.

In general, project construction and related traffic would temporarily increase the potential for motor vehicle and bicycle-pedestrian conflicts; however, it would not substantially interfere with the use of pedestrian and bicycle facilities through the project area. Project-generated truck and worker trips to and from the project area is estimated at up to about 76 vehicles (152 one-way trips) per day. Workers would commute before and after the morning and evening peak traffic periods, and haul truck trips would be spread over the course of the day. It is reasonable to assume, given that workers' residences would be spread among Bay Area cities, that project-related trips would be dispersed on different roads.

Existing access to the PRGC results in vehicles crossing the sidewalk and bicycle lane adjacent to John Muir Drive, particularly on Wednesday, Saturday, and Sunday, when the PRGC is open to the public. However, construction activities would increase the use of the existing access to the site and could temporarily and intermittently block pedestrian walkways or bicycle lanes, such as when construction vehicles off-hauling excavated materials cross the sidewalk and bicycle lane approximately 40 times per day at the access driveway and temporary driveway (if implemented), obstructing pedestrian and bicycle traffic. Additionally, these activities could temporarily and intermittently block the bicycle path immediately adjacent to the project site. However, sidewalk and bicycle route closures are not anticipated, outside of intermittent blockages by construction vehicles. Construction safety measures for pedestrians and alternative modes of transportation are required by regulations in the SFMTA's *Regulations for Working in San Francisco Streets (Blue Book)*.[59] In addition, the contractor would be required to maintain bicycle lanes and their widths to accommodate bicycle traffic during construction or seek a permit from the SFMTA to address bicycle detours and provide detour signs. If the SFMTA or SFDPW deem it necessary during the SFMTA's TASC review, a measure could be included in the project-specific Construction Management Plan. This measure would require posting "Share the Road" signs in advance of construction for the safety of bicyclists traveling near construction areas. (The construction management plan is described further below.)

While the SFMTA regulations would reduce the potential for pedestrian and bicycle conflicts, the temporary increase in interference with pedestrian and bicycle accessibility in and around the project site would be considered significant. However, implementation of **Mitigation Measure M-TR-1, Flag Control to Maintain Bicycle and Pedestrian Access,** would further reduce any potential construction-related impacts to pedestrians and bicyclists to a less-than-significant level by providing flaggers at the site entry/exit locations to coordinate the movement of construction vehicles, bicycles and pedestrians.

[59] San Francisco Municipal Transportation Agency (SFMTA), 2013. *Regulations for Working in San Francisco Streets, 8th Edition*, January 2012. www.sfmta.com. Accessed November 7, 2013.

Mitigation Measure M-TR-1: Implement Flag Control to Maintain Bicycle and Pedestrian Access.

The SFPUC and its contractor shall require flaggers to be present onsite during daily construction activities. Flaggers shall be located at the entry and exit locations of the project site and shall coordinate the movement of construction vehicles in and out of the project site. In addition, flaggers shall maintain access to on- and off-street bicycle and pedestrian facilities and the use of flaggers shall reduce any intermittent blockages to such facilities, and eliminate any long-term blockages to such facilities.

Impact TR-2: The project would not result in a change in air traffic patterns, including either an increase in traffic levels, obstructions to flight, or a change in location, that results in substantial safety risks. (No Impact)

The project site is not near an airfield; San Francisco International Airport is about nine miles to the southeast, and Metropolitan Oakland International Airport is about 15 miles to the east. These distances are outside of the limits of established height restrictions for development in the vicinity of airports, described in Federal Aviation Administration (FAA) regulations.[60] The CCSF's Police Pistol Range Heliport is approximately 1/3-mile northwest of the project site; however, the project would not construct any new structures or use equipment that would extend higher than existing structures on the site. Therefore, the project would have *no impact* on air traffic patterns, nor would it result in any substantial safety risks.

Impact TR-3: The project would not substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses. (Less than Significant)

The project and its related construction activities would neither change the road network nor introduce incompatible uses. However, it could cause temporary traffic safety hazards due to (1) conflicts where construction vehicles access a public right-of-way from the project site or (2) increased truck traffic with their slower speeds and wider turning radii. Traffic safety hazards could also occur where delivery and haul trucks share the roadway with other vehicles.

As described in Impact TR-1, above, the increase in daily traffic volumes resulting from construction traffic would not be substantial, relative to the background traffic volumes on roads used to access the project site; that is, generally, existing traffic volumes on regional roadway would increase by less than one percent, and existing traffic volumes on adjacent roadways would increase by one to two percent. In addition, the SFPUC would develop a construction management plan, in accordance with the SFMTA *Blue Book*. This plan would include measures to reduce any potential traffic safety hazards during construction; therefore, potential adverse traffic safety hazards on public roadways during construction would be *less than significant*.

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60 Federal Aviation Administration (FAA). Federal Regulations Part 77 (14 CFR 77). http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&rgn=div5&view=text&node=14:2.0.1.2.9&idno=14. Accessed November 4, 2013.

Impact TR-4: The project would not result in inadequate emergency access. (Less than Significant)

Construction staging areas and activities would be onsite, with no expected roadway or lane closures. The location of construction equipment, machinery, and support areas for stockpiling materials would be placed in zones outside of excavation; excavation and backfilling would be within other areas of the project site. As construction and remediation progress throughout the site, staging areas would be relocated to other zones outside of excavation. Access to the project site would be from the existing driveway entrance, along John Muir Drive, and possibly from a temporary, secondary entrance. These entrances would be accessible to emergency vehicles, and the project does not include any design features that would temporarily or permanently restrict emergency vehicles from the project site.

The increase in slow-moving trucks could briefly delay access to the site. Access to nearby land uses and cross streets for both general and emergency vehicles likewise could be briefly delayed. However, the temporarily increased truck traffic would be small in relation to the existing traffic volumes. Also, the SFPUC's construction management plan would require that emergency access be maintained at all times during construction. Because of these factors, the impacts on access, and in particular emergency access, would be *less than significant*.

Impact TR-5: The project would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. (Less than Significant with Mitigation)

Project construction would not directly or indirectly eliminate existing or planned alternative transportation facilities, such as bicycle/pedestrian paths, bicycle lanes, bus routes, and sidewalks. In addition, construction activities would not change policies or programs that support alternative transportation. Further, as described under Impact TR-1, temporary increases in traffic volumes on area roadways would not substantially affect traffic flow and circulation, including that of public transit vehicles. The SFPUC's construction management plan would maintain access to all modes of transportation along affected roadways and adjacent to the project site. However, construction activities and the increased daily movement of vehicles in and out of the project site could result in increased potential conflicts between construction vehicles and pedestrians and bicyclists, and could intermittently affect access to pedestrian and bicycle facilities in proximity to the project site. Based on these findings, project-related impacts to bicycle and pedestrian facilities and to users of such facilities would be considered significant. Therefore, as described under Impact TR-1, implementation of **Mitigation Measure M-TR-1** would reduce impacts to bicyclists and pedestrians to a *less-than-significant* level.

The project would not conflict with adopted policies, plans, or programs supporting alternative transportation. Given their limited scope, duration, and location within San Francisco, the construction-related activities associated with the proposed project would not conflict with the objectives and policies set forth in the Transportation Element of the *San Francisco General Plan*[61], nor would the project substantially affect the nine aspects of the citywide transportation system as defined in the *San Francisco General Plan*: general regional transportation, congestion management, vehicle circulation, transit, pedestrian, bicycles, citywide parking, and goods management. Furthermore, the proposed project would not result in conflict with the San Francisco's "Transit-First Policy"[62] and would not disrupt transit service or access to such facilities during the construction period. In addition and as previously discussed, Project 8-4 of the *San Francisco Bicycle Plan* (Class II bicycle lanes along John Muir Drive, between Lake Merced Boulevard and Skyline Boulevard) has been completed and the proposed project would not result in any conflict with this improvement project or any other bicycle improvement project identified in the *Bicycle Plan*. As previously discussed, the SFPUC or its contractor would prepare a detailed construction management plan, as required by the SFMTA *Blue Book* regulations, and such measures would not conflict with any adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Impact C-TR: The project, in combination with past, present, and reasonably foreseeable future projects, would not result in cumulative transportation and circulation impacts. (Less than Significant with Mitigation)

The geographic scope for the analysis of cumulative traffic impacts includes the local and regional roadways that would be used for project construction and for access by construction workers and haulers. These roadways include Lake Merced Boulevard, Brotherhood Way, Junipero Serra Boulevard, 19th Avenue, SR35 and SR1.

As indicated in Table 3, project construction could occur within the same vicinity and time frame as other planned projects. In addition to the identified project-related impacts, construction at the project site would contribute incrementally to cumulative traffic increases resulting from concurrent construction of cumulative projects in the same geographic area.

Roadways in the vicinity of the planned projects could experience an increase in traffic volumes due to combined construction activities, which could substantially worsen traffic conditions. The effects of potential detours and the additional construction-related vehicles could be accommodated within the capacity of the roadways and intersections. Nevertheless, the increased traffic volumes, detours, and road

[61] City and County of San Francisco, General Plan, 1995. http://www.sf-planning.org/ftp/general_plan/index.htm.

[62] In 1998, San Francisco voters amended the City Charter (Charter Article 8A, Section 8A.115) to include a Transit-First Policy. The Transit-First Policy is a set of principles that underscore the City's commitment that transit, bicycle, and pedestrian travel be given priority over travel by private automobile. These principles are embodied in the policies and objectives of the Transportation Element of the *San Francisco General Plan* and are addressed in Chapter 4, Plans and Policies.

and lane restrictions from potentially overlapping and concurrent projects could increase potential traffic hazards for drivers, bicyclists, and pedestrians on roadways affected by the proposed project. The combination of construction-related traffic impacts of projects in the cumulative scenario suggests the potential for a significant cumulative traffic impact to occur during construction.

As discussed under Impact TR-1, above, the required project-specific construction management plan and the *Regulations for Working in San Francisco Streets (Blue Book)* would require the SFPUC or its contractor to address potential transportation disruptions. In addition, the construction management plan would require the SFPUC to engage in ongoing coordination with the appropriate jurisdictional agencies through the TASC. Also, the SFPUC would be required to directly address potential cumulative transportation impacts from projects whose schedules and locations could overlap with the PRGC soil remediation project. With implementation of **Mitigation Measure M-TR-1**, potential impacts on bicyclists and pedestrians from trucks and vehicles entering and exiting the site would be reduced to a less-than-significant level. Thus, with mitigation, the project's contribution to a significant cumulative traffic impact on local and regional roads would not be cumulatively considerable (*less than significant with mitigation*).

E.6 Noise

Topics:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*	*Not Applicable*
6. NOISE—Would the project:					
a) Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐	☐
b) Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☒	☐	☐	☐
c) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☐	☒
d) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐	☐
e) For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?	☐	☐	☐	☐	☒
f) For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☐	☒
g) Be substantially affected by existing noise levels?	☐	☐	☐	☐	☒

The project consists solely of construction; no long-term maintenance or monitoring of the site would be necessary. Therefore, project implementation would not result in any permanent increases in ambient noise levels. The project site is not within an airport land use plan area, nor is it in the vicinity of a private airstrip. The project would not be affected by existing noise levels because the PRGC's activities would cease during project construction. Therefore, topics 6c, 6e, 6f, and 6g are not applicable.

Impact NO-1: During construction, the project would not result in a temporary increase in ambient noise levels and vibration in the project vicinity above levels existing without the project and would not expose persons to noise levels in excess of standards in the Noise Ordinance (Article 29 of the Police Code). (Less than Significant)

Article 29 of the *San Francisco Police Code*, revised November 25, 2008, regulates construction-related noise. Section 2907 limits noise levels from individual pieces of equipment to 80 decibels (dBA) at 100 feet, which is equivalent to 86 dBA at 50 feet. Impact tools, such as jackhammers, are exempt from this noise limit if they are equipped with intake and exhaust mufflers approved by the Director of Public Works or the Director of Building Inspection. Section 2908 allows for construction work during nighttime hours (defined by the code as 8:00 p.m. to 7:00 a.m.); however, construction-related noise cannot exceed the ambient noise level by 5 dBA at the nearest property line, unless a special permit is granted by the Director of Public Works or the Director of Building Inspection.

Onsite Construction Activities. Proposed construction hours are primarily from 7:00 a.m. to 6:00 p.m., within regular working hours (7:00 a.m. to 8:00 p.m.), as defined by Article 29 of the Police Code. The proposed construction hours would be consistent with the San Francisco Noise Ordinance, and no nighttime or weekend work is anticipated. With proposed conformance with ordinance time limits, no conflicts would occur during project construction, and this impact would be *less than significant*.

The types of construction equipment that would be used by the project are listed in Table 2 in Section A, Project Description. These are two excavators, two backhoes, a forklift, dump trucks, sediment processing equipment, and mixing equipment. The proposed equipment types are expected to generate maximum noise levels, ranging from about 76 dBA to 84 dBA (the maximum sound level, or L_{max}) at a distance of 50 feet from the source.[63] Thus, each piece of equipment would normally be anticipated to comply with the equivalent daytime ordinance noise limit of 86 dBA at 50 feet. With this proposed conformance with the ordinance noise limit, no conflicts would occur during project construction, and this impact would be *less than significant*.

63 US Department of Transportation, Federal Highway Administration, Construction Noise Handbook, 9.0 Construction Equipment Noise Levels and Ranges, Table 9.1, RCNM Default Noise Emission Reference Levels and Usage Factors. http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm. Accessed on August 28, 2013.

The closest sensitive receptor is a residential development to the southwest, across John Muir Drive. This is approximately 115 to 140 feet from the site's fence line. At this distance, the maximum noise levels of 75 to 84 dBA (L_{max}) would be reduced to 68 to 77 dBA (L_{max}), when adjusted for the minimum distance of 115 feet. Most structures of typical construction with windows closed can reduce noise levels by 25 dBA, resulting in maximum interior noise levels of 43 to 52 dBA. These are acceptable daytime interior noise levels, so temporary noise impacts on adjacent and nearby residents are considered to be *less than significant*.

Offsite Truck Traffic. Construction haul and delivery trucks would access the site using designated truck routes. This increase in truck traffic, compared to existing conditions, would contribute incrementally to traffic noise along these streets. Truck noise levels depend on vehicle speed, load, terrain, and other factors. The effects of construction-related truck traffic would depend on the existing level of background noise at a particular sensitive receptor. In quiet environments, such as residential neighborhoods that are protected by structural or topographic sound barriers, one truck per hour would be noticeable, even though such a low volume would not measurably increase noise levels. In such a scenario, the L_{eq}, or noise equivalent level (the average sound level), would be 50 dBA. In slightly noisier environments, where sensitive receptors are not protected by structural or topographic sound barriers (L_{eq} of 60 dBA), the threshold level is higher; 10 trucks per hour would be required to noticeably increase noise, as calculated by the Caltrans method.[64] In moderately noisy environments (L_{eq} of 70 dBA), a noise increase would be perceptible with the addition of 100 trucks per hour.

Local truck routes are anticipated to include northbound travel on John Muir Drive, to access the truck route on SR 35, and southbound travel on John Muir Drive to Lake Merced Boulevard, Brotherhood Way, and 19th Avenue to access I-280. According to the city-wide noise map[65] prepared by the San Francisco Department of Public Health (see **Figure 7**, Transportation Noise Map), existing traffic noise levels along these streets exceed 70 dBA (L_{dn} [the average day and night noise level]). Based on typical L_{dn}/L_{eq} (day) relationships involving traffic noise, daytime L_{eq} noise levels along these streets are likely approximately 3 to 4 dBA less than the L_{dn} levels. With this adjustment, ambient daytime noise levels along streets designated as proposed truck routes exceed 66 dBA (L_{eq}), depending on distance from the street. Therefore, increases of 40 or more trucks per hour could be perceptible (3 dBA increase). As discussed in Section E.5, Transportation and Circulation, the project would generate a maximum of 40 one way truck trips per day; the maximum number of truck trips would average less than four trucks per hour on identified truck routes. Therefore, truck traffic noise impacts on city streets would be *less than significant*.

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64 Caltrans, 1998. Technical Noise Supplement (TENS), A Technical Supplement to the Traffic Noise Analysis Protocol. October.

65 *Noise Map, Areas Potentially Requiring Noise Insulations*, San Francisco Department of Public Health, March 2009. http://www.sf-planning.org/ftp/files/publications_reports/library_of_cartography/Noise.pdf.

Day-Night Noise Level (Ldn)

- <55
- 55 - 59
- 60 - 64
- 65 - 69
- 70 - 74
- 75 - 79

SOURCE: San Francisco Department of Public Health, 2008.

Figure 7
Transportation Noise Map

Impact NO-2: The project would not result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. (Less than Significant with Mitigation)

Groundborne noise is that which is experienced inside a building or structure from vibrations produced outside of the building and transmitted as ground vibration between the source and receiver. Groundborne noise can be a problem in situations where the primary airborne noise path is blocked, such as in the case of a subway tunnel passing near homes or other noise-sensitive structures. However, the project's noise and vibration-generating construction activities would not involve tunneling or underground construction. Instead, it would use techniques that generate airborne noise and surface vibration. Therefore, no impacts are expected from construction-generated groundborne noise (*no impact*). Because of this, groundborne noise is not discussed further; the discussion below relates to impacts from groundborne vibration.

For transient or intermittent vibration, this analysis applies significance thresholds of cosmetic damage to buildings of 0.5 inch per second (in/sec) peak particle velocity (PPV); it applies 0.4 in/sec PPV for continuous vibration, such as that from vibratory compactors.[66] Typical vibration levels from various types of construction equipment at 25 feet are listed in **Table 5**; some of these are similar to the equipment proposed to be used for this project.

TABLE 5
VIBRATION LEVELS FOR CONSTRUCTION EQUIPMENT

	Peak Particle Velocity (in/sec)
Equipment	**At 25 Feet[a]**
Large, truck-mounted vibratory compactor	0.210
Large bulldozer/earthmoving equipment	0.089
Loaded trucks	0.076
Small, jumping-jack vibratory compactor	0.035
Jackhammer	0.035
Small bulldozer	0.003

[a] Vibration amplitudes for construction equipment assume normal propagation conditions.
SOURCE: FTA[67]

[66] Wilson, Ihrig & Associates, Inc. [WIA], *Vibration Criteria – New Irvington Tunnel Memo.* Prepared for Baseline Environmental – Jones & Stokes. December 9, 2008. "Transient" vibration is typically less than 20 second duration per occurrence and occurs infrequently, while "intermittent" vibration is typically 20 seconds or less per occurrence and occurs several times per hour on a regular basis. "Continuous" occurs when vibratory construction methods are employed, such as a vibratory compactor or vibratory pile driver.

[67] FTA, 2006. *Transit Noise and Vibration Impact Assessment*, DTA-VA-90-1003-06. May 2006. US Department of Transportation. Available on http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf (accessed February 1, 2012).

As indicated in Table 5, project-related construction activities would generate vibration levels well below the 0.5-in/sec PPV and 0.4-in/sec PPV vibration thresholds for offsite buildings. This would be true even if two pieces of equipment (e.g., two excavators or two trucks) were both operating 25 feet from a structure. Since all neighboring residential buildings are well over 25 feet from where construction equipment would operate, construction-related vibration levels would be less than those listed in Table 5. Vibrations from loaded trucks would also be less than those listed in Table 5 because adjacent residential buildings are over 60 feet from travel lanes on John Muir Boulevard. Therefore, vibration effects on adjacent or nearby offsite buildings or structures would be *less than significant*.

However, project-related construction equipment would operate immediately adjacent to onsite buildings, which range in age from 14 to 77 years old. If the large earthmoving equipment or loaded trucks were operated within 10 feet of these structures, or large vibratory compactors were used within 17 feet of buildings, the 0.4-in/sec PPV vibration thresholds for buildings could be exceeded; if so, this would be *a significant impact*. Due to their age (75 years or older) and construction, some of the older onsite buildings could be more easily damaged when large vibratory compactors or earth moving equipment are operated nearby. These buildings are the Clubhouse, Caretaker's House, Rifle Range Building, and Shell House. A more appropriate threshold for older buildings would be 0.2 in/sec PPV,[68] which could be exceeded when large earthmoving equipment is operated within 15 feet or large vibratory compactors/rollers are operated within 26 feet of the buildings. Based on the vibration levels for smaller construction equipment listed in Table 5, small jumping-jack (handheld) vibratory compactors and jackhammers could be operated as close as 8 feet to buildings, while small bulldozers could be operated as close as 1.5 feet to buildings without exceeding the 0.2 in/sec PPV threshold. Nevertheless, operation of heavy construction equipment, particularly large vibratory compactors such as those listed in Table 5, in proximity these buildings could be a significant impact. However, implementation of **Mitigation Measures M-NO-2a**, **Preconstruction Surveys and Repair** and **M-NO-2b, Construction Equipment Restrictions Near Buildings,** which requires preconstruction surveys of structures, repair of any vibration-related damage, and limiting vibration levels near buildings, would reduce potential adverse effects of construction-related vibration to *less than significant*.

Mitigation Measure M-NO-2a: Preconstruction Surveys and Repair.

SFPUC shall conduct a preconstruction survey of onsite buildings to document preconstruction building conditions. Following construction, the buildings shall be reinspected. Any new cracks or other changes in structures shall be compared to preconstruction conditions and a determination made as to whether project activities could have caused such damage. In the event that the project is demonstrated to have caused the damage, SFPUC shall be responsible for having the damage repaired to the pre-existing condition.

68 Ibid.

Mitigation Measure M-NO-2b: Construction Equipment Restrictions Near Buildings.

To minimize vibration effects, no earthmoving equipment shall be used within 1.5 feet of the Clubhouse, Caretaker's House, Rifle Range Building and Shell House; only small earthmoving equipment shall be used between 1.5 feet and 15 feet of the these buildings. No vibratory equipment shall be used within 8 feet of the Clubhouse, Caretaker's House, Rifle Range Building, and Shell House and only small vibratory equipment (including compactors) shall be used between 8 feet and 26 feet of these buildings. Small earthmoving equipment and vibrators shall be used within 10 feet and 17 feet, respectively, from other buildings.

Impact C-NO: The project, in combination with past, present, and reasonably foreseeable future projects, would result in less-than-significant cumulative noise impacts. (Less than Significant)

The geographic scope of potential cumulative noise impacts encompasses the project site, its immediate vicinity, and areas next to proposed haul routes. Construction of the project could result in temporary noise and vibration increases. Potential vibration impacts on onsite structures would be site-specific, as they would only occur within 26 feet of the structures; therefore, no significant impact would result from the cumulative scenario to which the project's incremental impact could contribute. Cumulative noise increases in the site vicinity could occur if there are concurrent construction activities in the site vicinity or if there are cumulative truck noise increases along shared haul routes. Cumulative projects listed in bold in Table 3 could overlap, to some extent, with construction of the proposed project. Of the projects listed in Table 3, the Fort Funston Site Improvements project is closest to the site (about 0.25 mile to the west). Construction at these two sites could pose cumulative noise impacts on residences between them if construction of these two projects were to occur at the same time. However, there is an intervening hill between these residences and the Fort Funston site, and the construction schedule for the Fort Funston project has not yet been determined. The intervening distance and topography would prevent any cumulative effects from construction-related noise even if construction of these two projects were to coincide. The other cumulative projects are located further away and would not contribute to a potential cumulative noise impact on nearby residences.

However, there is the potential for these projects to generate construction-related traffic on local access routes. If this were to occur, cumulative truck traffic and associated traffic noise increases could result on local access roads (John Muir Boulevard, SR 35, Lake Merced Boulevard, Brotherhood Way, and 19th Avenue). Currently, there are high traffic noise levels on these regional roadways (over 66 dBA L_{dn}). In such noise environments, truck traffic increases of 40 trucks per hour or more would be required to cause a perceptible increase in the noise environment (3 dBA increase) along these routes and, with the project contributing an average of less than 4 trucks per hour, such cumulative increases in truck traffic are not expected to occur. Therefore, cumulative noise increases in the site vicinity or cumulative truck noise increases along proposed haul routes from concurrent construction activities would be *less than significant*.

E.7 Air Quality

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact	Not Applicable
7. AIR QUALITY—Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal, state, or regional ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☒	☐	☐	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐	☐

The project consists solely of construction activities and no long-term maintenance or monitoring of the site remediation would be necessary. In addition, the site would be returned to its existing condition and revegetated once the proposed remediation project is completed. Therefore, there would be no long-term operational air quality emissions, and this analysis addresses temporary construction-related air quality impacts associated with project implementation.

The Bay Area Air Quality Management District (BAAQMD) is the regional agency with jurisdiction over the nine-county San Francisco Bay Area Air Basin (SFBAAB), which includes San Francisco, Alameda, Contra Costa, Marin, San Mateo, Santa Clara, and Napa Counties and portions of Sonoma and Solano Counties. The BAAQMD is responsible for attaining and maintaining air quality in the SFBAAB within federal and state air quality standards, as established by the federal Clean Air Act (CAA) and the California Clean Air Act (CCAA), respectively. Specifically, the BAAQMD has the responsibility to monitor ambient air pollutant levels throughout the SFBAAB and to develop and implement strategies to attain the applicable federal and state standards. The CAA and the CCAA require plans to be developed for areas that do not meet air quality standards, generally. The most recent air quality plan, the *2010 Clean Air Plan*, was adopted by the BAAQMD on September 15, 2010. The *2010 Clean Air Plan* updates the *Bay Area 2005 Ozone Strategy* in accordance with the requirements of the CCAA to implement all feasible measures to reduce ozone; provide a control strategy to reduce ozone, particulate matter, air toxics, and greenhouse gases in a single, integrated plan; and establish emission control measures to be adopted or implemented. The 2010 Clean Air Plan contains the following primary goals:

- Attain air quality standards;
- Reduce population exposure and protect public health in the San Francisco Bay Area; and
- Reduce greenhouse gas emissions and protect the climate.

The *2010 Clean Air Plan* represents the most current applicable air quality plan for the SFBAAB. Consistency with this plan is the basis for determining whether the proposed project would conflict with or obstruct implementation of air quality plans in Impact AQ-3, below.

San Francisco Clean Construction Ordinance

The San Francisco Clean Construction Ordinance (70-07) requires implementation of measures to reduce diesel emissions generated at publicly funded construction sites and related potential health risks. Specifically, the ordinance requires 1) the use of biodiesel fuel grade B20[69] or higher for off-road diesel equipment; and 2) use of Tier 2 or similar off-road equipment on city-funded projects such as the proposed project to reduce diesel emissions.

Criteria Air Pollutants

In accordance with the state and federal CAAs, air pollutant standards are identified for the following six criteria air pollutants: ozone, carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead. These air pollutants are termed criteria air pollutants because they are regulated by developing specific public health- and welfare-based criteria as the basis for setting permissible levels. In general, the SFBAAB experiences low concentrations of most pollutants when compared to federal or state standards and is designated as either in attainment[70] or unclassified for most criteria pollutants. However, the SFBAAB is designated as non-attainment[71] for ozone and particulate matter.

By its very nature, regional air pollution is largely a cumulative impact in that no single project is sufficient in size to result in non-attainment of air quality standards by itself. Instead, a project's individual emissions contribute to existing cumulative air quality impacts. If a project's contribution to cumulative air quality impacts is considerable, then the project's impact on air quality would be considered significant.[72]

The proposed project consists solely of construction activities and no long-term maintenance or monitoring of the site remediation would be necessary. Therefore, project implementation would not result in any long-term air quality impacts. This analysis addresses temporary construction-related air quality impacts

69 B20 is a mixture of 20 percent biodiesel and 80 percent petroleum.

70 Attainment status refers to those regions that are meeting federal and/or state standards for a specified criteria pollutant. Unclassified refers to regions where there is not enough data to determine the region's attainment status for a specified criteria air pollutant.

71 Non-attainment refers to regions that do not meet federal and/or state standards for a specified criteria pollutant.

72 Bay Area Air Quality Management District (BAAQMD),2011. *California Environmental Quality Act Air Quality Guidelines*, May 2011, page 2-1.

associated with project implementation. **Table 6** identifies air quality significance thresholds followed by a discussion of each threshold. Projects that would result in criteria air pollutant emissions below these significance thresholds would not violate an air quality standard, contribute substantially to an air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants within the SFBAAB.

TABLE 6
CRITERIA AIR POLLUTANT SIGNIFICANCE THRESHOLDS FOR CONSTRUCTION

Pollutant	Average Daily Emissions (lbs./day)
ROG	54
NO_x	54
PM_{10}	82 (exhaust)
$PM_{2.5}$	54 (exhaust)

SOURCE: BAAQMD, 2009

The potential for a project to result in a cumulatively considerable net increase in criteria air pollutants, which may contribute to an existing or projected air quality violation, are based on the state and federal CAAs emissions limits for stationary sources established by the federal New Source Review (NSR) program. Similarly, to ensure that new stationary sources do not cause or contribute to a violation of an air quality standard, BAAQMD Regulation 2, Rule 2 requires that any new source that emits criteria air pollutants above a specified emissions limit must offset those emissions.

The air quality analysis in Impact AQ-1 focuses primarily on the emissions of ozone and particulate matter (PM_{10} and $PM_{2.5}$)[73] because the SFBAAB is designated as non-attainment for these pollutants. These pollutants are described as follows:

Ozone Precursors. As discussed previously, the SFBAAB is currently designated as non-attainment for ozone and particulate matter. Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NO_X), referred to as ozone precursors. The potential for a project to result in a cumulatively considerable net increase in criteria air pollutants, which may contribute to an existing or projected air quality violation, are based on the state and federal Clean Air Acts emissions limits for stationary sources. To ensure that new stationary sources do not cause or contribute to a violation of an air quality standard, BAAQMD Regulation 2, Rule 2 requires that any new source that emits criteria air pollutants above a specified emissions limit must offset those emissions. For ozone precursors ROG and NO_x, the offset

73 PM_{10} is often termed "coarse" particulate matter and is made of particulates that are 10 microns in diameter or smaller. $PM_{2.5}$, termed "fine" particulate matter, is composed of particles that are 2.5 microns or less in diameter.

emissions level is an annual average of 10 tons per year (or 54 pounds [lbs.] per day).[74] These levels represent emissions by which new sources are not anticipated to contribute to an air quality violation or result in a considerable net increase in criteria air pollutants.

Particulate Matter (PM_{10} and $PM_{2.5}$). The federal New Source Review (NSR) program was created by the federal CAA to ensure that stationary sources of air pollution are constructed in a manner that is consistent with attainment of federal health based ambient air quality standards. For PM_{10} and $PM_{2.5}$, the emissions limit under NSR is 15 tons per year (82 lbs. per day) and 10 tons per year (54 lbs. per day), respectively. These emissions limits represent levels at which a source is not expected to have an impact on air quality.[75] Although the regulations specified above apply to new or modified stationary sources, land use development projects result in ROG, NO_x, PM_{10} and $PM_{2.5}$ emissions as a result of increases in vehicle trips, architectural coating and construction activities. Therefore, the above thresholds can be applied to the construction and operational phases of land use projects and those projects that result in emissions below these thresholds would not be considered to contribute to an existing or projected air quality violation or result in a considerable net increase in ozone precursors or particulate matter. Due to the temporary nature of construction activities, only the average daily thresholds are applicable to construction phase emissions.

Fugitive Dust. Fugitive dust emissions are typically generated during the construction phase of a project (see Impact AQ-1). Studies have shown that the application of best management practices (BMPs) at construction sites significantly control fugitive dust.[76] Individual measures have been shown to reduce fugitive dust by anywhere from 30 to 90 percent.[77] The BAAQMD has identified a number of BMPs to control fugitive dust emissions from construction activities.[78] The City's Construction Dust Control Ordinance (Ordinance 176-08, effective July 30, 2008) requires a number of measures to ensure that construction projects do not result in visible dust. The BMPs employed in compliance with the City's Construction Dust Control Ordinance is an effective strategy for controlling construction-related fugitive dust.

74 BAAQMD, Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance, October 2009, page 17.

75 BAAQMD, 2009. Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance, October 2009, page 16.

76 Western Regional Air Partnership. *2006. WRAP Fugitive Dust Handbook.* September 7, 2006. http://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf, accessed February 16, 2012.

77 BAAQMD, 2009. Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance, October 2009, page 27.

78 BAAQMD, 2011. CEQA Air Quality Guidelines, May 2011.

Local Health Risks and Hazards

In addition to criteria air pollutants, individual projects may emit toxic air contaminants (TACs). TACs collectively refer to a diverse group of air pollutants that are capable of causing chronic (i.e., of long-duration) and acute (i.e., severe but of short-term) adverse effects to human health, including carcinogenic effects. Human health effects of TACs include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees of toxicity. Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

Unlike criteria air pollutants, TACs do not have ambient air quality standards but are regulated by the BAAQMD using a risk-based approach to determine which sources and pollutants to control as well as the degree of control. A health risk assessment is an analysis in which human health exposure to toxic substances is estimated, and considered together with information regarding the toxic potency of the substances, to provide quantitative estimates of health risks.[79]

Air pollution does not affect every individual in the population in the same way, and some groups are more sensitive to adverse health effects than others. Land uses such as residences, schools, children's day care centers, hospitals, and nursing and convalescent homes are considered to be the most sensitive to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress or, as in the case of residential receptors, their exposure time is greater than for other land uses. Therefore, these groups are referred to as sensitive receptors. Exposure assessment guidance typically assumes that residences would be exposed to air pollution 24 hours per day, 350 days per year, for 70 years. Therefore, assessments of air pollutant exposure to residents typically result in the greatest adverse health outcomes of all population groups.

Exposures to fine particulate matter ($PM_{2.5}$) are strongly associated with mortality, respiratory diseases, and lung development in children, and other endpoints such as hospitalization for cardiopulmonary disease.[80] In addition to $PM_{2.5}$, diesel particulate matter (DPM) is also of concern. The California Air Resources Board (ARB) identified DPM as a TAC in 1998, primarily based on evidence demonstrating

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79 In general, a health risk assessment is required if the BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggest a potential public health risk. The applicant is then subject to a health risk assessment for the source in question. Such an assessment generally evaluates chronic, long-term effects, estimating the increased risk of cancer as a result of exposure to one or more TACs.

80 SFDPH, 2008. Assessment and Mitigation of Air Pollutant Health Effects from Intra-Urban Roadways: Guidance for Land Use Planning and Environmental Review, May 2008.

cancer effects in humans.[81] The estimated cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other TAC routinely measured in the region.

In an effort to identify areas of San Francisco most adversely affected by sources of TACs, San Francisco partnered with the BAAQMD to inventory and to assess air pollution and exposures from mobile, stationary, and area sources within San Francisco. Areas with poor air quality, termed "Air Pollutant Exposure Zones," were identified based on two health-protective criteria: (1) excess cancer risk from the contribution of emissions from all modeled sources greater than 100 per one million population, and/or (2) cumulative $PM_{2.5}$ concentrations greater than 10 micrograms per cubic meter ($\mu g/m^3$).

Excess Cancer Risk. The above 100 per one million persons (100 excess cancer risk) criteria is based on United State Environmental Protection Agency (USEPA) guidance for conducting air toxic analyses and making risk management decisions at the facility and community-scale level.[82] As described by the BAAQMD, the USEPA considers a cancer risk of 100 per million to be within the "acceptable" range of cancer risk. Furthermore, in the 1989 preamble to the benzene National Emissions Standards for Hazardous Air Pollutants (NESHAP) rulemaking,[83] the USEPA states that it "…strives to provide maximum feasible protection against risks to health from hazardous air pollutants by (1) protecting the greatest number of persons possible to an individual lifetime risk level no higher than approximately one in one million and (2) limiting to no higher than approximately one in ten thousand [100 in one million] the estimated risk that a person living near a plant would have if he or she were exposed to the maximum pollutant concentrations for 70 years." The 100 per one million excess cancer cases is also consistent with the ambient cancer risk in the most pristine portions of the Bay Area based on BAAQMD regional modeling.[84]

Fine Particulate Matter. In April 2011, the USEPA published *Policy Assessment for the Particulate Matter Review of the National Ambient Air Quality Standards*, "Particulate Matter Policy Assessment." In this document, USEPA staff conclude that the current federal annual $PM_{2.5}$ standard of 15 $\mu g/m^3$ should be revised to a level within the range of 13 to 11 $\mu g/m^3$, with evidence strongly supporting a standard within the range of 12 to 11 $\mu g/m^3$. Air Pollutant Exposure Zones for San Francisco are based on the health protective $PM_{2.5}$ standard of 11 $\mu g/m^3$, as supported by the USEPA's Particulate Matter Policy Assessment, although lowered to

81 California Air Resources Board (ARB), 1998. Fact Sheet, "The Toxic Air Contaminant Identification Process: Toxic Air Contaminant Emissions from Diesel-fueled Engines," October 1998.
82 BAAQMD, Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance, October 2009, page 67.
83 Ibid.
84 Ibid.

10 μg/m^3 to account for uncertainty in accurately predicting air pollutant concentrations using emissions modeling programs.[85]

Land use projects within these Air Pollutant Exposure Zones require special consideration to determine whether the project's activities would expose sensitive receptors to substantial air pollutant concentrations or add emissions to areas already adversely affected by poor air quality. The proposed project site is not located within an identified Air Pollutant Exposure Zone.

Impact AQ-1: The project's construction activities would violate an air quality standard or contribute substantially to an existing or projected air quality violation. (Less than Significant with Mitigation)

Construction activities (short-term) typically result in emissions of ozone precursors and particulate matter in the form of dust (fugitive dust) and exhaust (e.g., vehicle tailpipe emissions). Emissions of ozone precursors and particulate matter are primarily a result of the combustion of fuel from on-road and off-road vehicles. However, ROGs are also emitted from activities that involve painting, other types of architectural coatings, or asphalt paving. The project includes excavation and hauling of up to 46,500 cubic yards of soil for the site remediation, and import and placement of a corresponding volume of backfill materials. During the project's approximately 57-week construction period, construction activities would have the potential to result in fugitive dust emissions, ozone precursors, and particulate matter, as discussed below.

Fugitive Dust

Project-related excavation, backfilling, and other construction activities may cause wind-blown dust that could contribute particulate matter into the local atmosphere. Although there are federal standards for air pollutants and implementation of state and regional air quality control plans, air pollutants continue to have impacts on human health throughout the country. California has found that particulate matter exposure can cause health effects at lower levels than national standards. The current health burden of particulate matter demands that, where possible, public agencies take feasible available actions to reduce sources of particulate matter exposure. According to the ARB, reducing ambient particulate matter from 1998-2000 levels to natural background concentrations in San Francisco would prevent over 200 premature deaths.

Dust can be an irritant causing watering eyes or irritation to the lungs, nose, and throat. Demolition, excavation, grading, and other construction activities can cause wind-blown dust that adds particulate matter to the local atmosphere. Depending on exposure, adverse health effects can occur due to this

85 San Francisco Planning Department, 2013. Air Pollutant Exposure Zones and Proposed Article 38 Amendment Summary Memo, September 5, 2013.

particulate matter in general and also due to specific contaminants such as lead or asbestos that may be constituents of soil.

In response, the San Francisco Board of Supervisors approved a series of amendments to the San Francisco Building and Health Codes generally referred hereto as the Construction Dust Control Ordinance (Ordinance 176-08, effective July 30, 2008) with the intent of reducing the quantity of dust generated during site preparation, demolition and construction work in order to protect the health of the general public and of onsite workers, minimize public nuisance complaints, and to avoid orders to stop work by the Department of Building Inspection (DBI).

The Ordinance requires that all site preparation work, demolition, or other construction activities within San Francisco that have the potential to create dust or to expose or disturb more than 10 cubic yards or 500 square feet of soil comply with specified dust control measures whether or not the activity requires a permit from DBI. The Director of DBI may waive this requirement for activities on sites less than one half-acre that are unlikely to result in any visible wind-blown dust.

In compliance with the Construction Dust Control Ordinance, the project sponsor and the contractor responsible for construction activities at the project site would be required to use the following practices to control construction dust on the site or other practices that result in equivalent dust control that are acceptable to the Director. Dust suppression activities may include watering all active construction areas sufficiently to prevent dust from becoming airborne; increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water must be used if required by Article 21, Section 1100 et seq. of the San Francisco Public Works Code. If not required, reclaimed water should be used whenever possible. Contractors must provide as much water as necessary to control dust (without creating run-off in any area of land clearing, and/or earth movement). During excavation and dirt-moving activities, contractors must wet sweep or vacuum the streets, sidewalks, paths, and intersections where work is in progress at the end of the workday. Inactive stockpiles (where no disturbance occurs for more than seven days) greater than 10 cubic yards or 500 square feet of excavated material, backfill material, import material, gravel, sand, road base, and soil shall be covered with a 10 mil (0.01 inch) polyethylene plastic (or equivalent) tarp, braced down, or use other equivalent soil stabilization techniques.

For projects over one-half acre, such as the proposed project, the Dust Control Ordinance also requires that the project sponsor submit a Dust Control Plan for approval by the San Francisco Department of Public Health. The site-specific Dust Control Plan would require the project sponsor to: submit a map to the Director of Public Health showing all sensitive receptors within 1,000 feet of the site; wet down areas of soil at least three times per day; provide an analysis of wind direction and install upwind and downwind particulate dust monitors; record particulate monitoring results; hire an independent, third-party to conduct inspections and keep a record of those inspections; establish shut-down conditions based on wind, soil migration, etc.; establish a hotline for surrounding community members who may be potentially affected by project-related dust; limit the area subject to construction activities at any one time; install dust curtains and windbreaks on the property lines, as necessary; limit the amount of soil in hauling trucks to the size of the truck bed and securing with a tarpaulin; enforce a 15 mph speed limit for vehicles entering and exiting construction areas; sweep affected streets with water sweepers at the end of the day; install and utilize wheel washers to clean truck tires; terminate construction activities when winds exceed 25 miles per hour; apply soil stabilizers to inactive areas; and sweep off adjacent streets to reduce particulate emissions. The project sponsor would be required to designate an individual to monitor compliance with these dust control requirements.

Compliance with the regulations and procedures set forth by the San Francisco Dust Control Ordinance would ensure that potential dust-related air quality impacts would be maintained at *less-than-significant* levels without the need for additional mitigation.

Criteria Air Pollutants

Construction activities (short-term) typically result in emissions of ozone precursors and particulate matter in the form of dust (fugitive dust) and exhaust (e.g., vehicle tailpipe emissions). Emissions of ozone precursors and particulate matter are primarily a result of the combustion of fuel from on-road and off-road vehicles. However, ROGs are also emitted from activities that involve painting, other types of architectural coatings, or asphalt paving. The proposed project includes excavation and hauling of up to 46,500 cubic yards of soil for the site remediation, and construction would be constructed in five phases including demolition, site preparation, utility clearance, excavation and backfill, and site restoration. Heavy equipment, delivery/haul trucks, and workers commuting to the construction site would all generate exhaust emissions that would include criteria air pollutants. During the project's approximately 57-week construction period, construction activities would have the potential to result in emissions of ozone precursors and particulate matter, as discussed below.

The CalEEMod computer model was used to quantify emissions from construction equipment and the EMFAC2011 computer model was used to quantify emissions from on-site truck idling as well as from haul trips for export of excavated soil, import of clean backfill materials, and equipment delivery.[86] **Table 7** summarizes the assumed equipment fleet for each phase of construction, the number of hours each piece of equipment would be used each day, and how many days each piece of equipment would be used.

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[86] Orion Environmental Associates, 2014. Pacific Rod and Gun Club- Tier 2 Cal EEMod and EMFAC2011 Modeling, February 18, 2014.

TABLE 7
EQUIPMENT INCLUDED IN ESTIMATION OF CONSTRUCTION-RELATED EMISSIONS

Equipment	Quantity	Hours Used each Day	Duration of Use (days)
Demolition			
Excavator	1	8	10
Site Preparation			
Tractor/Loader/Backhoe	2	4	10
Forklift	1	4	10
Utility Clearance			
Tractor/Loader/Backhoe	2	4	5
Excavation and Backfill			
Excavator	2	8	240
Forklift	1	8	240
Dozer	2	8	240
Tractor/Loader/Backhoe	2	8	240
Site Restoration			
Forklift	1	8	20
Compactor	1	8	20

SOURCE: AMEC, Pacific Rod and Gun Club Construction Equipment and Workforce Estimates, November 26, 2013 and updated on February 13, 2014.

In addition, the trucking estimates are based on using 20 cubic-yard trucks to haul the 46,500 cubic yards of excavated soil to the Clean Harbors Buttonwillow Class I disposal facility and the Recology Class III disposal facility in Vacaville and to import an equivalent amount of clean backfill material. For disposal, one half of the exported soil was assumed to be transported to each disposal facility, and the mileage to Buttonwillow includes miles driven only within the SFAAB where the project would be located. With the inclusion of 50 truck trips for equipment delivery, an estimated average of 2,796 on-road truck miles would be driven during the excavation and backfill phase of construction.

Table 6 identifies air quality significance thresholds for specific criteria pollutants. Projects that would result in criteria air pollutant emissions below these significance thresholds would not violate an air quality standard, contribute substantially to an air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants within the SFBAAB.

The estimated unmitigated daily emissions are summarized in **Table 8**. The estimates for off-road construction equipment are based on the equipment and usage rates summarized in Table 7, using an equipment fleet that is comparable to the fleet required by the San Francisco Clean Construction Ordinance described above, including the use of Tier 2 equipment. As shown in this table, the unmitigated daily emissions of the criteria pollutants ROG, PM_{10}, and $PM_{2.5}$ from off-road construction equipment would be below the criteria pollutant thresholds listed in Table 6. NO_x emissions would exceed the 54 pounds/day significance criteria.

TABLE 8
UNMITIGATED AVERAGE DAILY CONSTRUCTION-RELATED CRITERIA POLLUTANT EMISSIONS (pounds/day)[a]

Year	ROG	NO_X	Exhaust PM_{10}	Exhaust $PM_{2.5}$
2014 Off-Road Construction Emissions[a]	1.3	30.1	5.9	3.5
2014 On-Site Idling Emissions[b]	0.05	0.49	0	0
2014 On-Road Trucking Emissions	1.07	55.95	0.77	0.71
Total Emissions – Before Mitigation	2.42	86.54	6.67	4.21
BAAQMD Construction Threshold	*54*	*54*	*82*	*54*
Exceeds Threshold?	No	**Yes**	No	No

NOTES: The construction workforce was assumed to be 15 workers per day for the demolition, site preparation, utility clearance, and site restoration phases of the project, and 30 workers per day for the excavation and backfill phase.

[a] Assumes compliance with San Francisco's Clean Construction Ordinance
[b] Assumes truck idling time is limited to five minutes in accordance with California state law
[c] Assumes the aggregate truck fleet age determined by the California Air Resources Board.

SOURCES: Orion Environmental Associates, 2014. CalEEMod output for equipment emissions and EMFAC2011 output for truck emissions. February 18, 2014

For truck idling emissions, on-site trucks were assumed to limit their idling time to 5 minutes at one time in accordance with the CARB Airborne Toxic Control Measure to limit Diesel-Fueled Commercial Motor Vehicle Idling. For on-road trucking emissions, the EMFAC2011 model used the default truck fleet age. The total maximum daily emissions of NO_X, under the proposed project would be 86.54 pounds per day. Consequently, air quality impacts from construction-related criteria pollutant emissions would be *significant*.

Implementation of **Mitigation Measure M-AQ-1, Construction Emissions Minimization**, would require the SFPUC to submit a Construction Emissions Minimization Plan (Plan) to the Environmental Review Officer (ERO) for review and approval by an Environmental Planning Air Quality Specialist demonstrating a 40 percent reduction in NOx emissions. This performance standard is met by reducing idling times to two minutes, properly maintaining vehicles, and using on-road haul trucks that are year 2010 or newer. As demonstrated in **Table 9**, use of an on-road truck fleet with an average age of not less than 2010 would reduce the maximum daily emissions of NO_X, to well below the threshold of 54 pounds per day. Other methods of reducing NO_X, could include use of Tier 3 engines on off-road diesel equipment which would reduce off-road NO_X, emissions to 17 pounds per day, and restricting truck idling time to two minutes which would reduce idling NO_X, emissions to 0.19 pounds per day, and these measures may be used in any combination to reduce NO_X, emissions during construction. With implementation of this plan, the project's construction-related impacts on criteria air pollutants would be reduced to a *less-than-significant* level.

TABLE 9
MITIGATED AVERAGE DAILY CONSTRUCTION-RELATED CRITERIA POLLUTANT EMISSIONS
(pounds/day)[a]

Year	ROG	NO_X	Exhaust PM_{10}	Exhaust $PM_{2.5}$
2014 Off-Road Construction Emissions[a]	1.3	30.1	5.9	3.5
2014 On-Site Idling Emissions[b]	0.05	0.49	0	0
2014 Mitigated On-Road Trucking Emissions[c]	1.07	9.97	0.77	0.71
Total Emissions – After Mitigation	2.42	40.56	6.67	4.21
BAAQMD Construction Threshold	*54*	*54*	*82*	*54*
Exceeds Threshold?	No	No	No	No

NOTES: Mitigated emissions assume the use of Tier 3 engines in diesel construction equipment and a 2010 average truck fleet age, as specified in Mitigation Measure M-AQ-1, Construction Emissions Minimization.

a Assumes compliance with San Francisco's Clean Construction Ordinance.
b Assumes truck idling time is limited to five minutes in accordance with California state law.
c Assumes an average truck fleet age of 2010.

SOURCES: Orion Environmental Associates, 2014. Pacific Rod and Gun ClubCalEEMod output for equipment emissions and EMFAC2011 output for truck emissions. February 18, 2014

Mitigation Measure M-AQ-1: Construction Emissions Minimization.

A. ***Construction Emissions Minimization Plan.*** The project sponsor shall reduce construction-related NOx emissions by a minimum of 40 percent as compared to that estimated in this environmental analysis. Prior to issuance of a construction permit, the project sponsor shall submit a Construction Emissions Minimization Plan (Plan) to the Environmental Review Officer (ERO) for review and approval by an Environmental Planning Air Quality Specialist. The requirements of this plan may be met by demonstrating project compliance with the following:

1. Limit truck idling time to two minutes. Legible and visible signs shall be posted in multiple languages (English, Spanish, Chinese) in designated queuing areas and at the construction site to remind operators of the two minute idling limit;

2. The project sponsor shall require that construction operators properly maintain and tune equipment in accordance with manufacturer specifications; and

3. All on-road haul trucks (i.e., trucks used for disposal of excavated material and delivery of clean fill) shall be year 2010 or newer.

Should the project sponsor choose to comply with this mitigation measure through any means other than the requirements listed above, the Plan shall demonstrate an equivalent reduction in NOx emissions (40%). The project sponsor shall submit to the ERO, prior to construction, all applicable construction equipment information required to ensure that the project sponsor has fully complied with this mitigation measure.

B. ***Reporting.*** Monthly reports shall be submitted to the ERO indicating the construction phase and off-road equipment information used during each phase including the information required in A, above.

Within six months of the completion of construction activities, the project sponsor shall submit to the ERO a final report summarizing construction activities. The final report shall indicate the start and end dates and duration of each construction phase.

C. ***Certification Statement and On-site Requirements.*** Prior to the commencement of construction activities, the project sponsor must certify (1) compliance with the Plan, and (2) all applicable requirements of the Plan have been incorporated into contract specifications.

Impact AQ-2: The project's construction activities would generate toxic air contaminants, including diesel particulate matter, but would not expose sensitive receptors to substantial pollutant concentrations. (Less than Significant)

Off-road equipment (which includes construction-related equipment) is a large contributor to DPM emissions in California, although since 2007, the ARB has found the emissions to be substantially lower than previously expected.[87] Newer and more refined emission inventories have substantially lowered the estimates of DPM emissions from off-road equipment such that off-road equipment is now considered the sixth largest source of DPM emissions in California.[88] This reduction in emissions is due, in part, to effects of the economic recession and refined emissions estimation methodologies. For example, revised particulate matter (PM) emission estimates for the year 2010, which DPM is a major component of total PM, have decreased by 83 percent from previous estimates for the SFBAAB.[89] Approximately half of the reduction can be attributed to the economic recession and approximately half can be attributed to updated assumptions independent of the economic recession (e.g., updated methodologies used to better assess construction emissions).[90]

Additionally, a number of federal and state regulations are requiring cleaner off-road equipment. Specifically, both the USEPA and California have set emissions standards for new off-road equipment engines, ranging from Tier 1 to Tier 4. Tier 1 emission standards were phased in between 1996 and 2000 and Tier 4 Interim and Final emission standards for all new engines will be phased in between 2008 and 2015. To meet the Tier 4 emission standards, engine manufacturers will be required to produce new engines with advanced emission-control technologies. Although the full benefits of these regulations will not be realized

[87] ARB, 2010. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Proposed Amendments to the Regulation for In-Use Off-Road Diesel-Fueled Fleets and the Off-Road Large Spark-Ignition Fleet Requirements, p.1 and p. 13 (Figure 4), October 2010.

[88] ARB, 2010. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Proposed Amendments to the Regulation for In-Use Off-Road Diesel-Fueled Fleets and the Off-Road Large Spark-Ignition Fleet Requirements, October 2010.

[89] ARB, 2012. "In-Use Off-Road Equipment, 2011 Inventory Model," Query, http://www.arb.ca.gov/msei/categories.htm#inuse_or_category, accessed April 2, 2012.

[90] ARB, 2010. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Proposed Amendments to the Regulation for In-Use Off-Road Diesel-Fueled Fleets and the Off-Road Large Spark-Ignition Fleet Requirements, October 2010.

for several more years, the USEPA estimates that by implementing the federal Tier 4 standards, NO_x and PM emissions will be reduced by more than 90 percent.[91] Furthermore, California regulations limit maximum idling times to five minutes, which further reduces public exposure to DPM emissions.[92]

In addition, construction activities do not lend themselves to analysis of long-term health risks because of their temporary and variable nature. As explained in the BAAQMD's *CEQA Air Quality Guidelines*:

> "Due to the variable nature of construction activity, the generation of TAC emissions in most cases would be temporary, especially considering the short amount of time such equipment is typically within an influential distance that would result in the exposure of sensitive receptors to substantial concentrations. Concentrations of mobile-source diesel PM emissions are typically reduced by 70 percent at a distance of approximately 500 feet (ARB 2005). In addition, current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities. This results in difficulties with producing accurate estimates of health risk."[93]

Therefore, project-level analyses of construction activities have a tendency to produce overestimated assessments of long-term health risks. However, within Air Pollutant Exposure Zones, as discussed above, additional construction activity may adversely affect populations that are already at a higher risk for adverse long-term health risks from existing sources of air pollution.

The project site is not located within an identified Air Pollutant Exposure Zone. Although on-road heavy-duty diesel vehicles and off-road equipment would be used during the 57-week construction duration, emissions would be temporary and variable in nature and would not be expected to expose sensitive receptors to substantial air pollutants. Furthermore, the proposed project would be subject to, and would comply with, California regulations limiting idling to no more than five minutes, which would further reduce nearby sensitive receptors exposure to temporary and variable DPM emissions. Therefore, construction period TAC emissions would result in a less-than-significant air quality impact on sensitive receptors.

Impact AQ-3: The project would not conflict with, or obstruct implementation of the 2010 Clean Air Plan. (Less than Significant)

The most recently adopted air quality plan for the SFBAAB is the *2010 Clean Air Plan*. The *2010 Clean Air Plan* is a road map that demonstrates how the San Francisco Bay Area will achieve compliance with the state ozone standards as expeditiously as practicable and how the region will reduce the transport of

91 United State Environmental Protection Agency (USEPA), 2004. "Clean Air Nonroad Diesel Rule: Fact Sheet," May 2004.
92 California Code of Regulations, Title 13, Division 3, § 2485.
93 BAAQMD, 2011. *CEQA Air Quality Guidelines*, May 2011, page 8-6.

ozone and ozone precursors to neighboring air basins. In determining consistency with the *2010 Clean Air Plan* (CAP), this analysis considers whether the project would: (1) support the primary goals of the CAP, (2) include applicable control measures from the CAP, and (3) avoid disrupting or hindering implementation of control measures identified in the CAP.

To meet the primary goals, the CAP recommends specific control measures and actions. These control measures are grouped into various categories and include stationary and area source measures, mobile source measures, transportation control measures, land use measures, and energy and climate measures. The CAP recognizes that to a great extent, community design dictates individual travel mode, and that a key long-term control strategy to reduce emissions of criteria pollutants, air toxics, and greenhouse gases from motor vehicles is to channel future Bay Area growth into vibrant urban communities where goods and services are close at hand, and people have a range of viable transportation options. To this end, the *2010 Clean Air Plan* includes 55 control measures aimed at reducing air pollution in the SFBAAB.

The measures most applicable to the project are transportation control measures and energy and climate control measures. The project would be consistent with these control measures as discussed in Topic 8, Greenhouse Gas Emissions (below), which demonstrates that the proposed project would comply with the applicable provisions of the City's Greenhouse Gas Reduction Strategy. Therefore, the project would not interfere with implementation of the *2010 Clean Air Plan*, and because the project would be consistent with the applicable air quality plan that demonstrates how the region will improve ambient air quality and achieve the state and federal ambient air quality standards, this impact would be *less than significant*.

Impact AQ-4: The project would not create objectionable odors that would affect a substantial number of people. (Less than Significant)

Typical odor sources of concern include wastewater treatment plants, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical manufacturing facilities, fiberglass manufacturing facilities, auto body shops, rendering plants, and coffee roasting facilities. During construction, diesel exhaust from construction equipment would generate some odors. However, construction-related odors would be temporary and would not persist upon project completion. Observations during a site visit on September 12, 2013, indicated that the project site is not substantially affected by sources of odors**.** Additionally, the proposed project does not include the construction of any new facilities and would be returned to its existing condition upon completion of the soil remediation. Therefore the project would not create a significant source of new odors and odor impacts would be *less than significant*.

Impact C-AQ: The project, in combination with past, present, and reasonably foreseeable future development in the project area would result in less–than-significant cumulative air quality impacts. (Less than Significant)

As discussed above, regional air pollution is by its very nature largely a cumulative impact. Emissions from past, present, and future projects contribute to the region's adverse air quality on a cumulative basis. No single project by itself would be sufficient in size to result in regional nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulative adverse air quality impacts.[94] The project-level thresholds for criteria air pollutants are based on levels by which new sources are not anticipated to contribute to an air quality violation or result in a considerable net increase in criteria air pollutants. As discussed in Impact AQ-1, the project's construction emissions would exceed the project-level thresholds for NO_X, but, implementation of Mitigation Measure M-AQ-1, Construction Emissions Minimization, would ensure that emissions during construction of the project would not exceed the BAAQMD threshold of 54 pounds per day for NO_X. Therefore, implementation of Mitigation Measure M-AQ-1 would ensure that the project would not result in a cumulatively considerable contribution to regional air quality impacts.

Although the project would be a new temporary source of TACs, the project site is not located within an Air Pollutant Exposure Zone. The project's incremental temporary increase in localized TAC emissions resulting from project construction would be minor and would not contribute substantially to cumulative TAC emissions that could affect nearby sensitive land uses. Therefore, cumulative air quality impacts would be considered *less than significant*.

E.8 Greenhouse Gas Emissions

Topics:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Not Applicable*
8. GREENHOUSE GAS EMISSIONS— Would the project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐	☐
b) Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐	☐

94 BAAQMD, 2011. *CEQA Air Quality Guidelines*, May 2011, page 2-1.

This section describes greenhouse gas (GHG) emissions and global climate change, the existing regulatory framework governing GHG emissions, and the potential GHG impacts from implementing the project. The project is evaluated for compliance with San Francisco's *Strategies to Address Greenhouse Gas Emissions*, recognized by the BAAQMD as meeting the criteria of a qualified GHG reduction strategy.

Setting

Gases that trap heat in the atmosphere are referred to as greenhouse gasses (GHGs) because they capture heat radiated from the earth, similar to the way a greenhouse traps heat. The accumulation of GHGs has been implicated as a driving force for global climate change. Definitions of climate change vary between and across regulatory authorities and the scientific community; however, in general it can be described as the changing of the earth's climate caused by natural fluctuations and anthropogenic activities (i.e., those relating to or resulting from the influence of humans) that alter the composition of the global atmosphere.

Sources of Greenhouse Gas Emissions

Individual projects contribute to the cumulative effects of climate change by emitting GHGs during demolition, construction, and operational phases. While the presence of the primary GHGs in the atmosphere is naturally occurring, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are largely emitted from human activities. The actions of humans accelerate the rate at which these compounds occur in earth's atmosphere. Emissions of carbon dioxide are largely by-products of fossil fuel combustion, whereas methane results from off-gassing associated with agricultural practices and landfills. Black carbon has recently emerged as a major contributor to global climate change, possibly second only to CO_2. Black carbon is produced naturally and by human activities as a result of the incomplete combustion of fossil fuels, biofuels, and biomass.[95] N_2O is a byproduct of various industrial processes and has a number of uses, including as an anesthetic and an aerosol propellant. Other GHGs include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, which are generated in certain industrial processes. GHGs are typically reported in "carbon dioxide-equivalent" measures (CO_2E).[96]

There is international scientific consensus that human-caused increases in GHGs have contributed to and will continue to contribute to climate change. Many impacts resulting from climate change, including increased fires, floods, severe storms, and heat waves, are occurring already and will only become more frequent and more costly.[97] Secondary effects of climate change are likely to include a global rise in sea

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95 Center for Climate and Energy Solutions, 2010. What is Black Carbon? April 2010. http://www.c2es.org/docUploads/what-is-black-carbon.pdf. Accessed May 20, 2013

96 Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon dioxide-equivalents," which present a weighted average based on each gas's heat absorption (or "global warming") potential.

97 California Natural Resources Agency, *2009 California Climate Adaptation Strategy Discussion Draft*, 2009, Sacramento. Pp. 48–55.

level; impacts on agriculture, the State's electricity system, and native freshwater fish ecosystems; changes in disease vectors; and changes in habitat and biodiversity.[98, 99]

The California Air Resources Board (ARB) estimated that in 2011 California produced about 448 million gross metric tons ($MMTCO_2E$; about 494 million US tons) of CO_2E.[100] The ARB found that transportation is the source of 38 percent of the state's GHG emissions, followed by industrial sources at 21 percent and electricity generation at 19 percent (both in-state generated and imported electricity). Commercial and residential fuel use (primarily for heating) accounted for 10 percent of GHG emissions.[101]

In the Bay Area, fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) and the industrial/commercial sector were the two largest sources of GHG emissions. Together they accounted for about 36 percent of the Bay Area's 95.8 $MMTCO_2E$ emissions in 2007. Industrial and commercial electricity and fossil fuel consumption (including office and retail) were the second largest contributors of GHG emissions, at about 34 percent of total emissions. Electricity generation accounts for approximately 16 percent of the Bay Area's GHG emissions. This is followed by residential fuel usage (e.g., home water heaters and furnaces) at 7 percent, off-road equipment at 3 percent, and agriculture at 12 percent. Among industrial sources, oil refining currently accounts for more than 40 percent of GHG emissions, or approximately 15 percent of the total Bay Area GHG emissions.[102]

Regulatory Setting

In 2005, in recognition of California's vulnerability to the effects of climate change, then-Governor Schwarzenegger established Executive Order S-3-05, which sets forth a series of target dates by which statewide GHGs emissions would be progressively reduced: by 2010, reduce GHG emissions to 2000 levels (approximately 457 $MMTCO_2E$); by 2020, reduce emissions to 1990 levels (estimated at 427 $MMTCO_2E$); and by 2050 reduce statewide GHG emissions to 80 percent below 1990 levels (approximately 85 $MMTCO_2E$).

In response, the California legislature passed Assembly Bill 32 in 2006 (California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), also known as the Global Warming Solutions Act. AB 32 requires ARB to design and implement emission limits, regulations, and other measures, such that

98 California Climate Change Portal, 2013. http://www.climatechange.ca.gov. Accessed December 12, 2013.

99 California Energy Commission, California Climate Change Center, 2013. Our Changing Climate 2012. http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf. Accessed December 12, 2013.

100 The abbreviation for "million metric tons" is MMT; thus, million metric tons of CO2 equivalents is written as $MMTCO_2E$.

101 California Air Resources Board, "California Greenhouse Gas Inventory for 2000-2011—by Category as Defined in the 2008 Scoping Plan," https://web.archive.org/web/20131213193153/http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-11_2013-08-01.pdf. Accessed November 6, 2013.

102 BAAQMD, *Source Inventory of Bay Area Greenhouse Gas Emissions: Base Year 2007*, February 2010 http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/regionalinventory2007_2_10.ashx. Accessed November 6, 2013.

feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction from forecast emission levels).[103]

Pursuant to AB 32, ARB adopted a scoping plan in December 2008, outlining measures to meet the 2020 GHG reduction limits. The scoping plan is the state's overarching plan for addressing climate change. In order to meet these goals, California must reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emissions levels, or about 15 percent from 2008 levels.[104] The scoping plan estimates a reduction of 174 $MMTCO_2E$ from the transportation, energy, agriculture, forestry, and high global warming potential sectors (see **Table 10**, below). In the scoping plan, ARB identified an implementation timeline for the GHG reduction strategies.[105] ARB is currently updating the 2008 scoping plan, and the 2013 update to the scoping plan will include ARB's climate change priorities for the next five years. Additionally, it will lay the groundwork to reach post-2020 goals set forth in Executive Order S-3-05.

The AB 32 scoping plan recommendations are intended to curb projected business-as-usual growth in GHG emissions and to reduce those emissions to 1990 levels. Therefore, meeting AB 32 GHG reduction goals would result in an overall annual net decrease in GHGs, compared to current levels, even accounting for projected increases in emissions resulting from anticipated growth.

The scoping plan also relies on the requirements of Senate Bill 375 (SB 375) to implement the carbon emission reductions anticipated from land use decisions. SB 375 was enacted to align local land use and transportation planning to further achieve California's GHG reduction goals. SB 375 requires regional transportation plans, developed by metropolitan planning organizations, to incorporate a "sustainable communities strategy" in their regional transportation plans that would achieve GHG emission reduction targets set by ARB. SB 375 also includes provisions for streamlined CEQA review for some infill projects, such as transit-oriented development. SB 375 would be implemented over the next several years. Plan Bay Area, the Bay Area Metropolitan Transportation Commission's 2013 Regional Transportation Plan, is the first plan subject to SB 375.

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103 Governor's Office of Planning and Research (OPR). Technical Advisory- CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review, June 19, 2008. http://opr.ca.gov/docs/june08-ceqa.pdf. Accessed May 22, 2013.

104 ARB. *California's Climate Plan: Fact Sheet*. http://www.arb.ca.gov/cc/facts/scoping_plan_fs.pdf. Accessed May 22, 2013.

105 ARB. *Assembly Bill 32: Global Warming Solutions Act*. http://www.arb.ca.gov/cc/ab32/ab32.htm/. Accessed May 22, 2013.

TABLE 10
GHG REDUCTIONS FROM THE AB 32 SCOPING PLAN SECTORS[a, b]

GHG Reduction Measures By Sector	GHG Reductions ($MMTCO_2E$)
Transportation sector	62.3
Electricity and natural gas	49.7
Industry	1.4
Landfill methane control measure (discrete early action)	1
Forestry	5
High global warming potential GHGs	20.2
Additional reductions needed to achieve the GHG cap	34.4
Total	**174**
Other Recommended Measures	
Government operations	1-2
Methane capture at large dairies	1
Additional GHG reduction measures:	
Water	4.8
Green buildings	26
High recycling/zero waste • Commercial recycling • Composting • Anaerobic digestion • Extended producer responsibility • Environmentally preferable purchasing	9
Total	**41.8-42.8**

[a] ARB. Climate Change Scoping Plan, December 2008. *http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm*. Accessed May 22, 2013.
[b] ARB. California's Climate Plan: Fact Sheet. http://www.arb.ca.gov/cc/facts/scoping_plan_fs.pdf. Accessed May 22, 2013.

AB 32 further anticipates that local government actions will reduce GHG emissions. ARB has identified a GHG reduction target of 15 percent from current levels for local governments themselves and notes that successful implementation of the scoping plan relies on local governments' land use planning and urban growth decisions. This is because local governments have the primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions.[106] The BAAQMD has analyzed the effectiveness of the region in meeting AB 32 goals from the actions outlined in the scoping plan. It determined that in order for the Bay Area to meet AB 32 GHG

[106] ARB. *Climate Change Scoping Plan*. December 2008. http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed November 6, 2013.

reduction goals, the Bay Area would need to achieve an additional 2.3 percent reduction in GHG emissions from the land use driven sector.[107]

Senate Bill 97 (SB 97) required the Office of Planning and Research (OPR) to amend the state CEQA guidelines to address the feasible mitigation of GHG emissions or the effects of GHGs. In response, OPR amended the CEQA guidelines to provide guidance for analyzing GHG emissions. Among other changes to the CEQA Guidelines, the amendments added a new section to the CEQA Checklist (CEQA Guidelines Appendix G) to address questions regarding the project's potential to emit GHGs.

The BAAQMD is the primary agency responsible for regulating air quality in the nine-county San Francisco Bay Area Air Basin. The BAAQMD recommends that local agencies adopt a GHG reduction strategy consistent with AB 32 goals. The BAAQMD also recommends that subsequent projects be reviewed to determine the significance of their GHG emissions, based on the degree to which that project complies with a GHG reduction strategy.[108] As described below, this recommendation is consistent with the approach to analyzing GHG emissions outlined in the CEQA guidelines.

At a local level, the CCSF has developed a number of plans and programs to reduce its contribution to global climate change. San Francisco's GHG reduction goals, as outlined in the 2008 Greenhouse Gas Reduction Ordinance, are as follows:

- By 2008, determine the CCSF's GHG emissions for 1990, which is the baseline level against which reductions are measured
- By 2017, reduce GHG emissions by 25 percent below 1990 levels
- By 2025, reduce GHG emissions by 40 percent below 1990 levels
- By 2050, reduce GHG emissions by 80 percent below 1990 levels

The CCSF's Greenhouse Gas Reduction Strategy documents its actions to pursue cleaner energy, to conserve energy, and to adopt alternative transportation and solid waste policies. As identified in the strategy, the CCSF has implemented a number of mandatory requirements and incentives that have measurably reduced GHG emissions. These include the following: increasing the energy efficiency of new and existing buildings; installation of solar panels on building roofs; implementation of a green building strategy; adoption of a zero waste strategy; a construction and demolition debris recovery ordinance; a solar energy generation subsidy; incorporation of alternative fuel vehicles in the City's transportation fleet

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[107] BAAQMD. California Environmental Quality Act Guidelines Update, Proposed Thresholds of Significance, December 2009. http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Proposed%20Thresholds%20of%20Significance%20Dec%207%2009.ashx. Accessed November 6, 2013.

[108] BAAQMD. *California Environmental Quality Act Air Quality Guidelines*, updated May 2012. http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx?la=en. Accessed November 6, 2013.

(including buses); and, a mandatory recycling and composting ordinance. The strategy also identifies 42 specific regulations for new development that would reduce their GHG emissions.

The Greenhouse Gas Reduction Strategy concludes that the CCSF's policies and programs have reduced GHG emissions below 1990 levels, exceeding statewide AB 32 GHG reduction goals. As reported, San Francisco's communitywide 1990 GHG emissions were approximately 6.15 MMTCO2E. A recent third-party verification of San Francisco's 2010 communitywide and municipal emissions inventory has confirmed that San Francisco has reduced its GHG emissions to 5.26 MMTCO2E, representing a 14.5 percent reduction in GHG emissions below 1990 levels.[109,110]

Approach to Analysis

In compliance with SB 97, OPR amended the CEQA Guidelines to address the feasible mitigation of GHG emissions or the effects of GHGs. Among other changes to the CEQA Guidelines, the amendments added a new section to the CEQA Checklist (CEQA Guidelines Appendix G) to address questions regarding the project's potential to emit GHGs. The potential for a project to result in significant GHG emissions which contribute to the cumulative effects global climate change is based on the CEQA Guidelines and CEQA Checklist, as amended by SB 97, and is determined by an assessment of the project's compliance with local and state plans, policies and regulations adopted for the purpose of reducing the cumulative effects of climate change. GHG emissions are analyzed in the context of their contribution to the cumulative effects of climate change because a single land use project could not generate enough GHG emissions to noticeably change the global average temperature. CEQA Guidelines Sections 15064.4 and 15183.5 address the analysis and determination of significant impacts from a proposed project's GHG emissions. CEQA Guidelines Section 15183.5 allows for public agencies to analyze and mitigate GHG emissions as part of a larger plan for the reduction of greenhouse gases and describes the required contents of such a plan. As discussed above, San Francisco has prepared its own Greenhouse Gas Reduction Strategy, demonstrating that San Francisco's policies and programs have collectively reduced communitywide

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109 ICF International. "Technical Review of the 2010 Community-wide GHG Inventory for City and County of San Francisco." Memorandum from ICF International to San Francisco Department of the Environment, April 10, 2012. http://www.sfenvironment.org/sites/default/files/fliers/files/icf_memo_to_sfe_-_2010_community-wide_ghg_inventory_-_4.10.2012.pdf. Accessed November 6, 2013.

110 ICF International. "Technical Review of San Francisco's 2010 Municipal GHG Inventory." Memorandum from ICF International to San Francisco Department of the Environment, May 8, 2012. http://www.sfenvironment.org/sites/default/files/fliers/files/memo_to_sfe_-_2010_municipal_ghg_inventory_-_icf_international_-_8_may_2012_-_final.pdf. Accessed November 6, 2013.

GHG emissions to below 1990 levels, meeting GHG reduction goals outlined in AB 32. The City is also well on its way to meeting the long-term GHG reduction goal of reducing emissions 80 percent below 1990 levels by 2050. Chapter 1 of the City's *Strategies to Address Greenhouse Gas Emission (*the Greenhouse Gas Reduction Strategy) describes how the strategy meets the requirements of CEQA Guidelines Section 15183.5. The BAAQMD has reviewed San Francisco's Greenhouse Gas Reduction Strategy, concluding that "Aggressive GHG reduction targets and comprehensive strategies like San Francisco's help the Bay Area move toward reaching the state's AB 32 goals, and also serve as a model from which other communities can learn."[111]

With respect to CEQA Guidelines Section 15064.4(b), the factors to be considered in making a significance determination include: 1) the extent to which GHG emissions would increase or decrease as a result of the proposed project; 2) whether or not a proposed project exceeds a threshold that the lead agency determines applies to the project; and finally 3) demonstrating compliance with plans and regulations adopted for the purpose of reducing or mitigating GHG emissions.

The GHG analysis provided below includes a qualitative assessment of GHG emissions that would result from a proposed project, including emissions from an increase in vehicle trips, natural gas combustion, and/or electricity use among other things. Consistent with the CEQA Guidelines and BAAQMD recommendations for analyzing GHG emissions, the significance standard applied to GHG emissions generated during project construction and operational phases is based on whether the project complies with a plan for the reduction of GHG emissions. The City's Greenhouse Gas Reduction Strategy is the City's overarching plan documenting the policies, programs and regulations that the City implements towards reducing municipal and communitywide GHG emissions. In particular, San Francisco implements 42 specific regulations that reduce GHG emissions which are applied to projects within the City. Projects that comply with the Greenhouse Gas Reduction Strategy would not result in a substantial increase in GHGs, since the City has shown that overall communitywide GHGs have decreased and that the City has met AB 32 GHG reduction targets. Individual project compliance with the City's Greenhouse Gas Reduction Strategy is demonstrated by completion of the Compliance Checklist for Greenhouse Gas Analysis.

In summary, the two applicable greenhouse gas reduction plans, the AB 32 Scoping Plan and the City's Greenhouse Gas Reduction Strategy, are intended to reduce GHG emissions below current levels. Given that the City's local greenhouse gas reduction targets are more aggressive than the State's 2020 GHG reduction targets and consistent with the long-term 2050 reduction targets, the City's Greenhouse Gas

[111] BAAQMD. *Letter from J. Roggenkamp, BAAQMD, to B. Wycko, San Francisco Planning Department*, October 28, 2010. Available online at: http://www.sf-planning.org/ftp/files/MEA/GHG-Reduction_Letter.pdf. Accessed September 24, 2012.

Reduction Strategy is consistent with the goals of AB 32. Therefore, proposed projects that are consistent with the City's Greenhouse Gas Reduction Strategy would be consistent with the goals of AB 32, would not conflict with either plan, and would therefore not exceed San Francisco's applicable GHG threshold of significance. Furthermore, a locally compliant project would not result in a substantial increase in GHGs.

The following analysis of the proposed project's impact on climate change focuses on the project's contribution to cumulatively significant GHG emissions. Given the analysis is in a cumulative context, this section does not include an individual project-specific impact statement.

Impact C-GG: The project would not generate greenhouse gas emissions at levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing greenhouse gas emissions. (Less than Significant)

The most common GHGs resulting from human activity are CO_2, CH_4, and N_2O.[112] The project could temporarily contribute directly to these GHG emissions during construction as a result of emissions from construction equipment and haul trucks delivering materials and transporting wastes offsite (natural gas combustion). Indirect emissions would result from electricity providers; energy required to pump, treat, and convey water; and emissions associated with landfill operations. The project would not result in an increase in GHG emissions once construction is completed because there would be no change in site operations or new sources of emissions.

The proposed project would be subject to and required to comply with several regulations adopted to reduce GHG emissions as identified in the City's Greenhouse Gas Reduction Strategy. The regulations that are applicable to the proposed project include the Clean Construction Ordinance, Resource Efficiency and Green Building Ordinance, Resource Conservation Ordinance, Mandatory Recycling and Composting Ordinance, and the Stormwater Management Ordinance and Construction Pollution Prevention Ordinance. As discussed above and consistent with the state CEQA Guidelines and BAAQMD recommendations for analyzing GHG emissions under CEQA, projects that are consistent with San Francisco's *Strategies to Address Greenhouse Gas Emissions* would result in a less-than-significant GHG impact. Based on an assessment of the project's compliance with San Francisco's *Strategies to Address Greenhouse Gas Emissions*, the project was determined to be consistent with San Francisco's GHG Reduction Strategy.[113].

[112] Governor's Office of Planning and Research, Technical Advisory—CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review, June 19, 2008. http://opr.ca.gov/docs/june08-ceqa.pdf. Accessed August 8, 2013.

[113] Greenhouse Gas Analysis: Compliance Checklist. March 3, 2014. This document is on file and available for public review as part of Case File No. 2013.1220E.

Given that: (1) San Francisco has implemented regulations to reduce GHG emissions specific to new construction and renovations of private developments and municipal projects; (2) San Francisco's sustainable policies have resulted in the measured reduction of annual GHG emissions; (3) San Francisco has met and exceeds AB 32 GHG reduction goals for the year 2020 and is on track towards meeting long-term GHG reduction goals; (4) current and probable future state and local GHG reduction measures will continue to reduce a project's contribution to climate change; and (5) San Francisco's *Strategies to Address Greenhouse Gas Emissions* meet the CEQA and BAAQMD requirements for a Greenhouse Gas Reduction Strategy, projects that are consistent with San Francisco's regulations would not contribute significantly to global climate change. The proposed project would be required to comply with the requirements listed above, and was determined to be consistent with San Francisco's *Strategies to Address Greenhouse Gas Emissions.* As such, the proposed project would result in a ***less-than-significant impact*** with respect to GHG emissions. No mitigation measures are necessary.

E.9 Wind and Shadow

Topics:	*Potentially Significant Impact*	*Less-than-Significant with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*	*Not Applicable*
9. WIND AND SHADOW—Would the project:					
a) Alter wind in a manner that substantially affects public areas?	☐	☐	☒	☐	☐
b) Create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas?	☐	☐	☐	☐	☒

The PRGC facility/project site is a recreation facility/public area. However, the project does not include the construction of new structures and would not otherwise create shadows. For this reason, Topic 9(b) is *not applicable* to the project.

Impact WS-1: The project would not alter wind in a manner that substantially affects public areas. (Less than Significant)

Wind speed and gustiness experienced by people at ground level are affected by the presence or absence of objects that obstruct the free flow of the wind. In this western edge of San Francisco, predominant winds, measured at the nearby BAAQMD meteorological station at Fort Funston, blow from the quadrant centered on west throughout the year.[114] Southwesterly winds are the most frequent and northwesterly winds are the strongest. Over the course of a day, the highest average wind speeds in the area typically occur in mid-afternoon and the lowest occur in early morning.

The project site is near the ocean, and the prevailing winds blow through the topographic depression along the Great Highway and across the widespread open areas of Lake Merced and the site. Because of these conditions, the wind at the project site is expected to blow in approximately the same direction and at nearly the same speed as at Fort Funston.

Public areas at the project site and adjacent pedestrian path could be affected if obstructions large enough to alter wind are now present and would be changed as a result of the project. Presently eight small single-story buildings and approximately 88 trees are on the project site. Winds in public areas around the site are influenced by the presence of these obstacles, but the effect of site structures and trees on wind speeds is nominal. Site buildings would not be removed or changed under the project. In general, individual trees and small stands provide some buffer to wind as it blows through the tree branches and leaves. At ground level, trees provide shelter from the wind in the immediate downwind vicinity. For example, an individual standing next to an onsite tree may perceive a decrease in wind; however, that wind reduction would be lost farther from the tree. Most of the site trees are on the border of the site, along John Muir Drive, with the exception of a stand of about 30 trees at the southwestern corner of the site; however, this stand abuts a dense stand of trees to the west.

The project would require the removal of approximately 81 trees in order to effectively remediate contaminated soils. Tree removal is not anticipated to substantially alter winds at the project site, except within the immediate vicinity of the trees to be removed. Therefore, the project would not alter winds in a manner that substantially affects public areas, and the impact would be *less than significant*. Although unrelated to wind effects, some screening vegetation would be replanted along John Muir Drive east of the site entrance for aesthetics purposes in accordance with Mitigation Measure M-AE-1 (Screening Vegetation).

Impact C-WS: The project, in combination with past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact from alteration of wind in a manner that substantially affects public areas. (No Impact)

Both the speed and the turbulence of the winds that reach any given place on earth are affected by the topography and features of the lands that lie upwind. Winds moving over San Francisco encounter

[114] Bay Area Air Quality Management District (BAAQMD), 2013. BAAQMD Meteorological Data, Fort Funston, Site I.D: 5905. http://hank.baaqmd.gov/tec/data/metdata5905.html. November 27, 2013.

differing levels of surface roughness and take on differing wind speed profiles due to differing topography, vegetation, and structures that slow the wind near the ground. Smooth surfaces, such as flat open ground, or water bodies, such as the ocean, do not slow the wind nearly as much as do rough surfaces, such as stands of trees or the mix of single-story or multistory buildings and landscaping in a developed urban area. Although there are interactions between the atmosphere and urban development in the vicinity of the site, the scale of local development is insufficient to cause any potential cumulative impact. The only potential wind impacts are those that would result from an individual project.

The geographic scope of potential cumulative wind impacts on public areas is limited to public areas in the vicinity. There are two potential cumulative projects in the vicinity of Lake Merced listed in Table 3.The Vista Grande Drainage Basin Improvement Project (Project 2), includes construction of a water conveyance and storage structure along John Muir Drive, near the project site, but would not include changes to surface structures that could affect wind patterns.

Management actions for the Lake Merced area under the proposed update to the SNRAMP (Project 1) include the removal of approximately 134 of the estimated 12,000 invasive blue gum eucalyptus trees, less than one percent of the total inventory, to maintain and enhance native habitats.[115] The cumulative effect of the proposed project and the proposed update to the SNRAMP could result in the removal of approximately 200 trees in public areas in the Lake Merced vicinity. Given the large area of the Lake Merced watershed and the localized wind effects of removing these trees, no cumulative change in the wind conditions would result.

Because wind speed changes would occur only on those portions of the site in the vicinities of removed trees, the project impacts would be site-specific and, therefore, could not contribute to a potential cumulative impact from altering wind in a manner that substantially affects public areas. Accordingly, there would be *no impact*.

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[115] San Francisco Planning Department, 2011. Significant Natural Resource Areas Management Plan Draft Environmental Impact Report, August 2011.

E.10 Recreation

Topics:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Not Applicable*
10. RECREATION—Would the project:					
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated?	☐	☐	☒	☐	☐
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☐	☒
c) Physically degrade existing recreational resources?	☐	☐	☒	☐	☐

The project does not include new recreational facilities or new housing development which, in turn, could require the construction or expansion of recreational facilities; therefore, Topic 10(b) is not applicable.

Impact RE-1: The project would not increase the use of existing recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. (Less than Significant)

A project could increase the use of existing neighborhood and regional parks or other recreational facilities either through population growth, which would increase the overall number of recreational facility users, or by closure of an existing recreational facility, which would displace recreational users to other similar parks or recreational facilities. As described in Section E.3, Population and Housing, the project does not propose new residential development and does not necessitate the construction of new housing, permanently displacing housing, or otherwise creating additional housing demand. Therefore, the project is not expected to contribute to population growth, which could increase the overall number of people using parks or recreational facilities.

Currently, the PRGC facility is open three days a week from 11:00 a.m. to 5:00 p.m. There are three trap fields, six skeet fields, and a rifle range used for recreational shooting and a clubhouse/banquet hall available for events. Site remediation would require closing the PRGC facilities during project activities. [116] During the period that the PRGC is displaced from the site as a result of project soil remediation activities, the PRGC's 400 members and other users of the club's recreational trap and skeet shooting areas and

[116] The existing PRGC lease for the site expires in January 2015 and it is unknown at this time whether this lease will be renewed. Regardless, the project that is the subject of this Initial Study/Mitigated Negative Declaration is limited to the proposed soil remediation, as ordered by the RWQCB.

clubhouse facilities would need to use alternate facilities if they wish to continue practicing this form of recreation during the implementation of the proposed project.

Other public trap and skeet shooting facilities in the Bay Area include the Richmond Rod and Gun Club in Richmond, the Chabot Gun Club in Castro Valley, the United Sportsmen Incorporated in Concord, the Los Altos Rod and Gun Club in Los Gatos, the Livermore-Pleasanton Rod and Gun Club in Livermore, and the Coyote Valley Sporting Clays in Morgan Hill. The Richmond Rod and Gun Club is nearest to the project site, at approximately 19 miles to the northeast. Additional types of shooting ranges are also located in the Bay Area, as are more trap and skeet facilities within a couple hours' drive in the Central Valley. Numerous banquet facilities are available for rental in San Francisco and the Bay Area.

While the club's 400 members and other recreational users of the PRGC facility could be displaced temporarily to other similar facilities, recreational visits would likely be dispersed among the six available trap and skeet shooting facilities in the Bay Area and others in the Central Valley. The potential for substantial physical deterioration of these alternate recreational facilities from a temporary increase in users is low. This is because each alternate facility limits the number of possible visitors by the number of available ranges, hours, and operational requirements. Based on the availability of alternate recreational facilities, this impact would be *less than significant*.

Impact RE-2: The project would not result in substantial physical degradation of existing recreational resources. (Less than Significant)

The proposed soil remediation project is intended to remediate soil at the project site, which has been degraded due to PRGC's historical trap and skeet shooting. As discussed in Section A, Project Description, elevated concentrations of lead and PAHs in site soils exceed acceptable human health risks for frequent site users and pose a threat to water quality in Lake Merced. Based on its use and location next to the lake, open space, and trails, the project site is a recreational resource. Lake Merced and surrounding areas provide for a variety of boating, windsurfing, fishing, walking/jogging, picnic, and nature appreciation activities.[117] Implementation of the project would improve existing degraded site conditions with respect to hazardous materials in soils, would protect site users from harmful exposures, and would reduce the potential for site contaminants to adversely affect water quality in Lake Merced. Therefore, the proposed project would improve the condition of the onsite recreational resource that currently is physically degraded due to elevated conditions of lead and PAHs.

[117] SFPUC, 2011. Lake Merced Watershed Report, January 2011.

During project construction, range facilities would be stored off site by PRGC during construction for potential reuse at the site or elsewhere and to avoid their damage or degradation. Site buildings, such as the clubhouse, rifle range building, trap house, and shell house, would remain in place but would be closed during project implementation. Following the excavation of contaminated soils and backfilling with clean fill material, the excavated areas would be compacted and graded to return the land to conditions similar to the existing ground contours at the site and would be hydroseeded for erosion control (see Section A.4.8, Backfilling and Site Restoration, above). Some of the existing paved areas would be replaced with a compacted base (permeable surface). Therefore, following remediation of the contaminated soil, the site would again be available for use as a recreational resource.[118] In sum, project implementation would remediate soil contamination at the PRGC facility, would avoid damage or degradation of site buildings and range facilities, and would generally restore conditions at the site. Thus, impacts associated with degradation of recreational resources would be *less than significant*.

Impact C-RE: The project, in combination with past, present, and reasonably foreseeable future projects, would not result in cumulative recreation impacts. (Less than Significant)

The geographic scope of potential recreation impacts includes the project area, immediate vicinity, and other recreational facilities that offer the same amenities as the PRGC in the vicinity. Cumulative impacts on the environment could occur if the development of additional recreation facilities were required as a result of the cumulative projects identified in Table 3 or if increased use of existing facilities could result in their degradation or deterioration due to the implementation of these identified cumulative projects.

The project and most other identified planned or proposed cumulative projects (see Table 3, above) do not include substantial increases in housing or other aspects that would result in substantial increases in potential recreationists using recreation resources in the project vicinity. The exceptions are the Parkmerced Project and the San Francisco State University Campus Master Plan. Given the wide variety and quantity of nearby public open space and recreational opportunities, the anticipated onsite population for the Parkmerced Project would not increase the use of these public facilities such that substantial physical deterioration of existing facilities would occur or be accelerated. Further, the Parkmerced Project would provide 68 acres of open space in a network of publically accessible neighborhood parks, athletic fields, public plazas, greenways, and an organic farm.[119] Future developments would be subject to Planning Code open space requirements to provide public or private open space or both. For these reasons, the project, in combination with other past, present, and reasonably foreseeable future projects, would result in a *less-than-significant* cumulative impact.

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[118] As noted in Section A.4, Project Characteristics, the existing PRGC lease for the site expires in January 2015 and it is unknown at this time whether the lease will be renewed; this is unrelated to the proposed soil remediation project.

[119] San Francisco Planning Department, 2010. Draft Environmental Impact Report Parkmerced Project : Volume I, page III.16.

E.11 Utilities and Service Systems

Topics:	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Not Applicable
11. UTILITIES AND SERVICE SYSTEMS— Would the project:					
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☐	☒
d) Have sufficient water supply available to serve the project from existing entitlements and resources, or require new or expanded water supply resources or entitlements?	☐	☐	☐	☒	☐
e) Result in a determination by the wastewater treatment provider that would serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒	☐

The project consists solely of temporary construction activities; there are no operations and maintenance activities or permanent structures associated with the project. The project would not require or result in the need for or construction of new or expanded water, wastewater, or stormwater collection and treatment systems. Topics 11(b) and 11(c) are therefore *not applicable* to this project.

Impact UT-1: The project would have sufficient water supply available to serve the project from existing entitlements and resources, and it would not require new or expanded water supply resources or entitlements. (No Impact)

Project construction would require a limited amount of water for dust suppression and potentially for soil washing. The temporary use of water during construction would be negligible, relative to the available water supply provided by the SFPUC. The project involves no operations and maintenance, so it would not require the provision of new water supply resources or water entitlements. As a result, there would be *no impact.*

Impact UT-2: The project would not exceed the wastewater treatment requirements, nor would it result in a determination by the wastewater treatment provider that it has inadequate capacity to serve the project's estimated future demand in addition to the provider's existing commitments. (Less than Significant)

The CCSF's combined sewer system collects and transports wastewater and stormwater to one of three wastewater treatment facilities in San Francisco through sewer pipes and storm drains. Currently, the only wastewater from sinks and toilets at the project site is discharged to the combined sewer system, for treatment at the Oceanside WPCP. Stormwater from the site flows into Lake Merced.[120] Site buildings that generate wastewater would be closed during the project, except for the public restrooms, which would be used by construction workers. The maximum number of construction workers onsite at one time is about 45. Therefore, because the site would not be in use by club members or the public during construction, the amount of wastewater generated by the largest construction crew would likely be equivalent to or less than the volume generated during current site uses.

Project construction may include soil washing for onsite treatment of excavated soil, which would require wastewater disposal. Generally, water used for soil washing is kept in a closed loop system and is not disposed of until cleanup is complete. Wastewater generated from soil washing, if performed, would be discharged into a nearby sanitary sewer for treatment at the Oceanside WPCP. This plant can treat 17 million gallons per day (MGD), on average, and up to 65 MGD when it rains.[121] In past remediation efforts tracked by the USEPA, the water used for soil washing was not a RCRA hazardous waste. This means that this water could be disposed of at a local wastewater treatment plant.[122]

Construction-related discharges to the local sewer system would be in accordance with discharge permit requirements. These ensure that discharges would not exceed the volume or treatment requirements of the wastewater treatment provider and would meet the wastewater pre-treatment requirements of the SFPUC, as required by the San Francisco Industrial Waste Ordinance.[123] Based on the regulatory requirements for wastewater disposal and the size of the temporary project's potential contribution relative to the treatment plant capacity, disposal of project wastewater would have a *less-than-significant impact* on the wastewater utility system.

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120 SFPUC, 2011. *Lake Merced Watershed Report*. January 2011.
121 SFPUC, 2013. *Oceanside Treatment Plant*, http://sfwater.org/index.aspx?page=622. Accessed December 2, 2013.
122 USEPA, *Best Management Practices for Lead at Outdoor Shooting Ranges*, June 2005, p. III-15. http://www.epa.gov/region02/waste/leadshot/epa_bmp.pdf.
123 San Francisco Public Works Code, Article 4.1 (amended by Ordinance No. 19-92, January 13, 1992).

Impact UT-3: The project would be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs. (Less than Significant)

The project could significantly affect solid waste disposal facilities if it were to generate volumes of waste material that exceed the local waste diversion goals or daily tonnage limit of local landfills. Waste materials generated by the project would mostly consist of excavated contaminated soils and some construction debris. Construction debris would include shot and target pieces, asphalt and concrete, tables, and wooden and chain-link fencing.

All waste materials would be stockpiled onsite, separated according to waste characterization criteria. Then the materials would be either recycled or disposed of in compliance with all applicable regulatory standards. Concrete and asphalt and nonhazardous metal fencing, pipes, and conduits would be sent to appropriate recycling facilities. Wood fencing, nonhazardous soil, and other nonhazardous debris that cannot be recycled would be sent to the Recology Hay Road Landfill (Class II/III) facility in Vacaville.[124] Hazardous soil would be sent to the Buttonwillow Facility (Class I) in Buttonwillow, California.[125] A California-licensed hazardous materials removal contractor would excavate and remove the soil.

The San Francisco Construction and Demolition Ordinance (Ordinance No. 27-06) requires that at least 65 percent of construction and demolition debris be recycled or diverted from landfills. This ordinance would apply only to the nonhazardous and undesignated construction and demolition waste generated during the project.

An estimated maximum of 46,500 cubic yards of soil and other debris would be excavated for the project and delivered to appropriate disposal facilities, at a rate of approximately 200 cubic yards per day. The SFPUC estimates that approximately half of the excavated material would require disposal at the Buttonwillow Class I facility,[126] which as of 2010 had a total active landfill capacity of 13,535,000 cubic yards.[127] The amount of excavated material that would be sent to the Buttonwillow facility is less than one percent of available landfill capacity. Should soil washing or chemical stabilization of soils be used, the quantity of soil requiring disposal at a Class I facility could be reduced.

As required under the San Francisco Construction and Demolition Ordinance, at least 65 percent of the nonhazardous excavated soil and construction debris would need to be recycled. The remaining 35 percent, a maximum of approximately 8,100 cubic yards, could be disposed of at the Recology Hay Road Landfill. Its

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124 Nzewi, Obi, SFPUC, email communication with Julie Moore, ESA, November 7, 2013.
125 Ibid.
126 Ibid.
127 ICF International, 2012. Technical Memorandum: Facility History for Clean Harbors Buttonwillow Facility. August 14.

capacity was 30,433,000 cubic yards in 2010; its operations are anticipated to cease in 2077.[128] The landfill facility can accept up to 2,400 tons of solid waste per day. The total volume of excavated soil that could be sent to the Hay Road Landfill would be far less than one percent of the remaining capacity of the landfill; at a maximum, it would account for approximately 0.1 percent of the allowed daily throughput. Because the project would be consistent with CCSF ordinances and because the local landfills would have sufficient capacity to accept the remaining construction waste, the project would be served by a landfill(s) with sufficient permitted capacity to accommodate its solid waste disposal needs. As a result, the impact would be *less than significant.*

Impact UT-4: The project would comply with federal, state, and local statutes and regulations related to solid waste. (No Impact)

The California Integrated Waste Management Act of 1989 (AB 939) requires municipalities to adopt an Integrated Waste Management Plan (IWMP) to establish objectives, policies, and programs relative to waste disposal, management, source reduction, and recycling. Reports filed by the San Francisco Department of the Environment show that the City generated approximately 870,000 tons of waste material in 2000. By 2010, that figured decreased to approximately 455,000 tons. Waste diverted from landfills is defined as recycled or composted. San Francisco has a goal of 75 percent landfill diversion by 2010, and 100 percent by 2020.[129] As of 2012, 80 percent of San Francisco's solid waste was being diverted from landfills, having met the 2010 diversion target.[130]

The San Francisco Construction and Demolition Ordinance (Ordinance No. 27-06) requires a minimum of 65 percent of all construction and demolition debris to be recycled and diverted from landfills. Waste disposal for the project would comply with the construction and demolition debris diversion rate.

As discussed in Section E.16, Hazards and Hazardous Materials, excavated soil could be classified as a hazardous waste. In order to determine the appropriate disposal facility for excavated materials, excavated soils would be stockpiled, sampled, and analyzed for hazardous materials in accordance with landfill criteria. Accordingly, the project would also be required to follow state and federal regulations for the disposal of hazardous wastes at a permitted disposal or recycling facility.

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128 California Department of Resources Recycling and Recovery, 2013. *Facility/Site Summary Details: Recology Hay Road (48-AA-0002)*. http://www.calrecycle.ca.gov/SWFacilities/Directory/48-aa-0002/Detail/. Accessed November 6, 2013.

129 City and County of SFDPH, Environmental Health Section. Available online at https://web.archive.org/web/20130417063621/http://www.sustainablesf.org/indicators/. Accessed on November 14, 2013.

130 San Francisco Department of the Environmental, *Recology & City Recycling & Compost Program Creates Jobs, Stimulates Growth of Green Economy & Supports City's 2020 Zero Waste Goal*, October 5, 2012. Available online at http://www.sfenvironment.org/news/press-release/mayor-lee-announces-san-francisco-reaches-80-percent-landfill-waste-diversion-leads-all-cities-in-north-america. Accessed November 14, 2013.

Therefore, because the project would comply with all applicable local, state, and federal laws and regulations pertaining to solid waste, there would be *no impact*.

Impact C-UT: The project, in combination with past, present, and reasonably foreseeable future projects, would not result in cumulative utilities and service system impacts. (Less than Significant)

The geographic scope for potential cumulative utilities and service systems impacts consists of the project area, its immediate vicinity, and the service areas of regional service/utility providers. Wastewater system facilities in the project vicinity include the San Francisco's combined sewage system and the Oceanside WPCP or other treatment plants. A number of landfills are located within 100 miles that could be utilized by the cumulative projects listed in Table 3, as well as by a wide variety of additional users. The proposed project would result in less-than-significant impacts on wastewater treatment providers and landfill capacity.

Similar to the proposed project, cumulative projects under construction at the same time within the vicinity would utilize the same wastewater systems, which would increase the demand on such facilities. As indicated in Table 3, construction of various projects could occur at the same time as the project. These projects would be subject to the same set of regulations as the project, requiring a discharge permit for all construction-related discharges to the local sewer system. Permit requirements would ensure that discharges would not exceed the volume or treatment requirements of the SFPUC. Accordingly, no significant cumulative impact would result from the cumulative scenario to which the project's incremental impact could contribute.

Most of the cumulative projects listed in Table 3, regardless of construction date, would dispose of construction debris at available landfills, which would contribute to potential impacts on available landfill capacity. As discussed in Impact UT-3, the project would dispose of approximately 8,100 cubic yards of nonhazardous solid waste which would be deposited in a landfill (assuming compliance with the CCSF's 65 percent diversion requirement). Similarly, the other cumulative projects would also be required to divert at least 65 percent of solid waste generated; however, construction debris could be disposed at any number of landfills. Solid waste contributions received at the Recology Hay Road landfill during the proposed soil remediation project could also be generated by projects outside of San Francisco but within the service area of the Hay Road landfill. For the purposes of this analysis, conservatively, there could be a significant cumulative impact on landfill capacity to which both the PRGC soil remediation project and other projects could contribute. As noted above, as of 2010 the Recology Hay Road Landfill had a remaining capacity of over 30 million cubic yards and accepts up to 2,400 tons of material per day. The incremental effect of the project's daily and overall solid waste contribution to the Hay Road landfill would be a very small proportion of the total daily and overall landfill capacity. As a result, the project's contribution to a cumulative impact on landfill capacities would not be cumulatively considerable (*less than significant*).

E.12 Public Services

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
12. PUBLIC SERVICES— Would the project:					
a) Result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any public services such as fire protection, police protection, schools, parks, or other services?	☐	☐	☐	☒	☐

Impact PS-1: The project would not result in substantial adverse physical impacts associated with the provision of, or need for, new or physically altered governmental facilities. (No Impact)

The project consists solely of construction activities; there would be no long-term operations or maintenance. During the proposed 57-week construction period, up to 45 construction workers would be employed at the project site, depending on the phase of construction. Construction workers are expected to come from any part of the Bay Area. While it is possible that some workers might temporarily relocate from other areas, the project would not result in a substantial increase in the local population.

Potential incidents requiring law enforcement, fire protection, or emergency services could occur during construction; however, any temporary increase in incidents would not exceed the capacity of local law enforcement, fire protection, and emergency facilities such that new or expanded facilities would be required. This is because any temporary increase in the local population during construction would be negligible and could be accommodated by existing service providers.

In addition, project implementation would not permanently increase the local population. Because the project workforce and construction duration are short term, there would be no need for new or physically altered government facilities to maintain existing levels of public services. For these reasons, the project would have *no impact* on public services.

E.13 BIOLOGICAL RESOURCES

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
13. BIOLOGICAL RESOURCES— Would the project:					
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☐	☒

There are no adopted habitat conservation plans, natural community conservation plans, or other applicable habitat conservation plans that would be applicable to the project site; therefore, Topic 13(f) related to conflicts with such a plan, is *not applicable*.

Approach to Analysis

The approach to analysis for this project is as follows: (1) review available biological resource surveys of the project area and relevant surrounding vicinity; (2) review special-status species lists derived from the California Natural Diversity Database (CNDDB), the US Fish and Wildlife Service (USFWS), the CDFW,[131]

[131] The California Department of Fish and Game (CDFG) changed its name on January 1, 2013. to the California Department of Fish and Wildlife (CDFW). In this document, references to literature published by CDFW before Jan. 1, 2013, are cited as 'CDFG, [year]'. The agency is otherwise referred to by its new name, CDFW.

and the California Native Plant Society (CNPS); and, (3) to perform a field reconnaissance of the project site to record current site conditions.

Previous Biological Resource Surveys

Certain project sites in the vicinity of Lake Merced have been previously surveyed for biological resources, including special-status wildlife and flora, waters of the United States and of the state, and other sensitive natural communities. No focused special-status wildlife or plant surveys were performed for this project analysis.

The following documents were reviewed and are referenced to support the analysis of potential environmental impacts of the project:

- *San Francisco Groundwater Supply Project Final EIR*[132]
- *Harding Park Recycled Water Project Final EIR*[133]
- *Lake Merced Watershed Report*[134]
- *Significant Natural Resource Areas Management Plan Staff Report*[135]
- *Significant Natural Resource Areas Management Plan–Final Draft*[136]
- *Significant Natural Resource Areas Management Plan Draft EIR*[137]

The findings of these previous biological resources analyses were used to compile the list of special-status species that may occur at the project site (see **Appendix B**).

Special-Status Species Lists

Special-status species lists were derived from the CNDDB, USFWS, CDFW, and CNPS for the San Francisco North and San Francisco South 7.5-minute US Geological Survey quadrangles. The primary sources of data referenced for this study were as follows:

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[132] San Francisco Planning Department, 2013. *San Francisco Groundwater Supply Project Final Environmental Impact Report*. Planning Department Case No. 2008.1122E, State Clearinghouse No. 2009122075. Prepared for the SF Planning Department. December 2013.

[133] ESA, 2009. Harding Park Recycled Water Project Final Environmental Impact Report. Prepared for the City of Daly City, October 2009.

[134] San Francisco Public Utilities Commission (SFPUC), 2011. *Lake Merced Watershed Report*, January 2011.

[135] San Francisco Recreation and Park Department, 1995. Staff Report on the *Significant Natural Resource Areas Management Plan*, San Francisco Recreation and Park Commission, January 1995.

[136] San Francisco Recreation and Park Department (SFRPD), *Significant Natural Resource Areas Management Plan– Final Draft*, February 2006.

[137] San Francisco Planning Department, *Significant Natural Resource Areas Management Plan Draft Environmental Impact Report*, Planning Department Case No. 2005.1912E, State Clearinghouse No. 2009042102, August 2011a.

- Federal Endangered and Threatened Species that May be Affected by Projects in the San Francisco North and San Francisco South, California, US Geological Survey 7.5-minute topographic quadrangles[138]
- CNPS, Online Inventory of Rare and Endangered Plants[139]
- CNDDB, Rarefind 4 computer program[140]
- Threatened and Endangered Plants List[141]
- Threatened and Endangered Animals List[142]

The findings of these database searches and species lists were used to compile the list of special-status species that may occur at the project site (Appendix B).

Reconnaissance Survey

Biological resources within the project site were verified by an ESA biologist during a field reconnaissance conducted on November 4, 2013. Prior to the reconnaissance survey, databases were reviewed for the project site and surrounding area. The field reconnaissance consisted of a pedestrian survey within the project site's boundary and observations of the adjacent environments. The field surveys were focused on identifying habitat for special-status plant and wildlife species. General habitat conditions were noted and incidental species observations were recorded. The findings of the reconnaissance survey, the literature review, and the database queries were used to compile the list of special-status species that may occur at the project site (Appendix B) and to characterize the local project setting, described below.

Environmental Setting

Regional Setting

The project is located in the Bay Area–Delta Bioregion,[143] as defined by the State of California's Natural Communities Conservation Program. This bioregion consists of a variety of natural communities that range

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[138] USFWS, 2013. Federal Endangered and Threatened Species that Occur in or May be Affected by Projects in the San Francisco North and San Francisco South US Geological Survey 7.5-minute Quadrangles. USFWS Endangered Species Division. http://www.fws.gov/sacramento/ES_Species/Lists/es_species_lists-form.cfm.

[139] CNPS, 2013. Inventory of Rare and Endangered Plants (online edition, v7-13nov 11-7-13). Sacramento, California. http://www.cnps.org/cnps/rareplants/inventory. Accessed November 11, 2013.

[140] CDFW, 2013. California Natural Diversity Database Rarefind 4. Biogeographic Data Branch, Sacramento. Data dated October 31, 2013.

[141] CDFW, 2013a. State and Federally Listed Endangered, Threatened, and Rare Plants of California. Biogeographic Data Branch, Sacramento. Data dated July 2013.

[142] CDFW, 2013b. State and Federally Listed Endangered &Threatened Animals of California. Biogeographic Data Branch, Sacramento. Data dated October 2013.

[143] A bioregion is an area defined by a combination of ecological, geographic, and social criteria and consists of a system of related interconnected ecosystems. The Bay-Delta bioregion is considered the immediate watershed of the Bay Area and the Delta, not including the major rivers that flow into the Delta. It is bounded on the north by the northern edge of Sonoma and Napa Counties and the Delta and extends east to the edge of the valley floor; on the south, it is bounded by the southern edge of San Joaquin County, the eastern edge of the Diablo Range, and the southern edge of Santa Clara and San Mateo Counties.

from the open waters of San Francisco Bay and Delta to salt and brackish marshes to grassland, chaparral, and oak woodlands. The temperate climate is Mediterranean, with relatively mild, wet winters and warm, dry summers. The high diversity of vegetation and wildlife in the region is a result of soil, topographic, and microclimate variations, which combine to promote relatively high levels of endemism.[144] This, in combination with a long history of uses that have altered the natural environment and the increasingly rapid pace of development in the region, has endangered some of the local flora and fauna.

The San Francisco Bay-Delta is the second-largest estuary in the United States and supports numerous aquatic habitats and biological communities. It encompasses 479 square miles and includes shallow mudflats, tidal marshes, and open waters. The San Francisco Bay-Delta is an important wintering and migratory stopover site on the Pacific Flyway. More than 300,000 wintering waterfowl use the region.

Local Project Setting

The project site is located at 520 John Muir Drive on the southwest side of Lake Merced in southwestern San Francisco, California. Remediation would occur in the upland portions of the developed project site, containing non-native forest and poor quality non-native herbaceous habitat, and extend into the emergent freshwater marsh wetlands on the banks of Lake Merced. Within the site are five main buildings and smaller ancillary buildings used by the PRGC, large paved and gravel parking lots, and skeet and trap shooting ranges. The project site extends from the southern fence line along John Muir Drive to the top of the slope, where dune scrub, riparian, and wetland vegetation extends down to the open water. Lake Merced consists of four interconnected freshwater lakes: North Lake, South Lake, East Lake, and Impound Lake. This area offers habitat for many wildlife species, particularly resident and migratory birds. The project site is on the southwest shore of South Lake.

Land uses in the project vicinity include parks, golf courses, and urban residential and commercial development. Urban development is primarily concentrated on the south side of John Muir Drive and the east side of Lake Merced Boulevard.

Vegetation Communities and Habitat Types

Non-native forest. The northwest and southeast boundaries of the project site are dominated by mature, non-native trees that primarily consist of blue gum eucalyptus (*Eucalyptus globulus*), Australian blackwood (*Acacia melanoxlon*), Monterey pine (*Pinus radiata*), and Monterey cypress (*Hesperocyparis macrocarpa*). Monterey pine and Monterey cypress are native to California but not to the San Francisco

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[144] Endemism refers to the degree to which organisms or taxa are restricted to a geographical region or locality and thus are individually characterized as endemic to that area.

area. The understory is largely dominated by non-native cape ivy (*Delairea odorata*), English ivy (*Hedera helix*), and garden nasturtium (*Tropaeolum majus*).

Non-native herbaceous. Much of the project site is comprised of non-native grass and weed species. These areas include most of the open areas between the PRGC buildings, parking lot, and trap and skeet fields, which encompass much of the remediation area. Non-native plant species are typical of poor quality, ruderal vegetation. Species observed on the November 4, 2013, reconnaissance survey are ripgut brome (*Bromus diandrus*), wild oats (*Avena barbata*), soft chess (*Bromus hordeaceus*), Italian ryegrass (*Festuca perennis*), red-stemmed filaree (*Erodium cicutarium*), wild radish (*Raphanus raphanistrum*), black mustard (*Brassica nigra*), prickly lettuce (*Lactuca serriola*), bristly ox-tongue (*Helminthotheca echioides*), cheeseweed (*Malva parviflora*), hare's tail grass (*Lagurus ovatus*), everlasting cudweed (*Pseudognaphalium luteoalbum*), poison hemlock (*Conium maculatum*), and an established population of iceplant (*Carpobrotus edulis*).

Native scrub. Native scrub vegetation is present between the upland and riparian communities of the project site remediation area near the lake. Native species include coyote brush (*Baccharis pilularis*), California coffeeberry (*Rhamnus californica*), yellow bush lupine (*Lupinus arboreus*), toyon (*Heteromeles arbutifolia*), California wax myrtle (*Morella californica*), and poison oak (*Toxicodendron diversilobum*). Scrub habitat provides important cover for terrestrial and avian species to forage and nest within, including the white-crowned sparrow (*Zonotrichia leucophrys*)~~fox sparrow (*Passerella illiaca*)~~ and California towhee (*Melozone crissalis*).

Arroyo willow riparian scrub. This vegetation community is present along the banks of South Lake, within and adjacent to the project site remediation boundary, forming patches of dense thickets with a canopy of native arroyo willow (*Salix lasiolepis*). Additional native species within this community are California blackberry (*Rubus ursinus*), California bulrush (*Schoenoplectus californicus),* swamp knotweed (*Persicaria coccinea*), and bracken fern (*Pteridium aquilinum* var. *pubescens*). Non-native Himalayan blackberry (*Rubus armeniacus*) was also abundant within this vegetation community. Arroyo willow riparian scrub at South Lake is important habitat for migratory and resident birds, including yellow warbler (*Setophaga petechia*), a California species of special concern,~~Townsend's warbler (*Dendroica townsendi*),~~ ruby-crowned kinglet (*Regulus calendula*), green heron (*Butorides virescens*), black phoebe (*Sayornis nigricans*),~~western kingbird (*Tyrannus verticalis*),~~ and warbling vireo (*Vireo gilvus*).

Lake and freshwater marsh. While not within the project footprint, South Lake borders the project site directly to the north. The lake provides suitable habitat for aquatic wildlife, including native species, such as mallard (*Anas platyrhynchos*), American coot (*Fulica americana*), great blue heron (*Ardea herodias*), grebe (*Podiceps* spp.), egret (*Egretta* spp.), and the non-native red-eared slider (*Trachemys scripta*). Western pond turtle (*Actinemys marmorata*), a California species of special concern, is known to occur in Lake Merced.

California red-legged frogs occurred historically at Lake Merced, but the species is now considered extirpated from the lake based on a lack of recent sightings, survey results since 2000, and the presence of predators and competitors, such as bullfrogs and red-eared sliders[145]. Plants common to the lake perimeter include California bulrush (*Schoenoplectus californicus*), tules (*Schoenoplectus acutus* var. *occidentalis*), and broadleaf cattail (*Typha latifolia*). This freshwater emergent wetland or marsh habitat bordering the lake to the north and adjacent to the project area is valuable to many avian species foraging and nesting annually at Lake Merced, such as marsh wren (*Cistothorus palustris*), common yellowthroat (*Geothlypis trichas*), pied-billed grebes (*Podilymbus podiceps*), and ruddy duck (*Oxyura jamaicensis*).[146]

Wetlands and Other Waters

Two definitions of "wetland" are considered for purposes of this project, one administered by the U.S. Army Corps under the federal Clean Water Act and the other administered by the San Francisco Bay Regional Water Quality Control Board (RWQCB) under the Porter-Cologne Water Quality Control Act and the California Coastal Commission (CCC) under the California Coastal Act. Both definitions are presented below.

Federal Wetland Definition. Wetlands are a subset of waters of the United States and receive protection under Section 404 of the Clean Water Act. The term "waters of the United States,"[147] as defined in the Code of Federal Regulations (33 CFR 328.3[a]; 40 CFR 230.3[s]), includes:

1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
2. All interstate waters including interstate wetlands. (Wetlands are defined by the federal government [CFR, Section 328.3(b)] as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.)
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters which are or could be used by interstate or foreign travelers for recreational or other purposes; or from which fish or shellfish are or could be taken and sold in

145 Jones and Stokes, *Probable Absence of California Red-Legged Frog from Lake Merced*, Oakland, CA, 2007.
146 San Francisco Field Ornithologists, *San Francisco Breeding Bird Atlas*, 2003.
147 Based on the Supreme Court ruling in *Solid Waste Agency for Northern Cook County v. U.S. Army Corps of Engineers* related to federal jurisdiction over isolated waters (January 9, 2001), non-navigable, isolated, intrastate waters are no longer defined as waters of the United States based solely on their use by migratory birds. Jurisdiction over non-navigable, isolated, intrastate waters may be exercised if their use, degradation, or destruction could affect other waters of the Unites States or interstate or foreign commerce. According to this ruling, jurisdiction over such other waters must be analyzed on a case-by-case basis, as should impoundments of waters, tributaries of waters, and wetlands adjacent to waters. The Supreme Court's recent decisions (e.g., *Rapanos* and *Carabel*) have yet to be interpreted in Corps regulations or definitions.

interstate or foreign commerce; or which are used or could be used for industrial purposes by industries in interstate commerce.

4. All impoundments of waters otherwise defined as waters of the United States under the definition.
5. Tributaries of waters identified in paragraphs (1) through (4).
6. Territorial seas.
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6).
8. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the U.S. Environmental Protection Agency.

California Wetland Definition. California agencies have adopted the Cowardin et al.[148] classification system to define wetlands. According to this classification system, wetlands must have one or more of the following three attributes: (1) at least periodically, the land predominantly supports hydrophytes;[149] (2) the substrate is predominantly undrained hydric soil; or (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.

Under normal circumstances, the federal definition of wetlands requires all three wetland identification parameters to be met, whereas the Cowardin definition requires the presence of at least one of these parameters. Jurisdictional wetlands and other Waters of the United States and Waters of the State of California occur adjacent to the project site.

Regulation of Activities in Wetlands. The Corps has primary federal responsibility for administering regulations that concern waters and wetlands. In this regard, the Corps acts under two statutory authorities: the Rivers and Harbors Act (Sections 9 and 10), which governs specified activities in "navigable waters," and the Clean Water Act (Section 404), which governs the fill of waters of the United States, including wetlands. The Corps requires that a permit be obtained if a project proposes to place fill in navigable waters and/or to alter waters of the United States below the ordinary high-water mark in non-tidal waters. The USEPA, USFWS, NMFS, and several other agencies may comment on Corps permit applications. The USEPA provides the primary criteria for evaluating the biological impacts of Corps permit actions in wetlands.

[148] Cowardin et al., 1979. *Classification of Wetlands and Deepwater Habitats of the United States.* December.
[149] The USFWS has developed the following definition for hydrophytic vegetation: "plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content" (Cowardin et al., 1979).

The State's authority to regulate activities in wetlands and waters at the project site resides primarily with the RWQCB, which regulates fill in and discharges to Waters of the United States and Waters of the State of California, including activities in wetlands, under Section 401 of the Clean Water Act, and the Porter-Cologne Water Quality Control Act. The CDFW provides comment on Corps permit actions under the Fish and Wildlife Coordination Act. Moreover, under Sections 1600–1616 of the California Fish and Game Code, the CDFW regulates activities that would substantially divert, obstruct the natural flow of, or change rivers, streams, and lakes. The jurisdictional limits of the CDFW are defined in Section 1602 of the California Fish and Game Code as the bed, channel, or bank of any river, stream, or lake. The CDFW regulates activities that would result in the deposit or disposal of debris, waste, or other materials into any river, stream, or lake, and requires preparation of a streambed alteration agreement for activities that are proposed within or near a river, stream, or lake.

Within the California Coastal Zone, the CCC also has authority to regulate development according to the provisions of the California Coastal Act. The coastal zone generally extends three miles seaward and about 1,000 yards inland from the mean high tide line of the sea. In significant coastal estuarine, habitat, and recreational areas it extends inland to the first major ridgeline paralleling the sea or five miles from the mean high tide line of the sea, whichever is less, and in developed urban areas the zone generally extends inland less than 1,000 yards. In order to carry out the policies of the Coastal Act, each of the 73 cities and counties in the coastal zone is required to prepare a local coastal program (LCP) for the portion of its jurisdiction within the coastal zone and to submit the program to the Commission for certification. The CCC manages protection of biological resources through a permitting process for all projects in the coastal zone. Once the CCC certifies a LCP, the local government gains authority to issue most coastal development permits (CDP). The CCC generally retains permit authority over tidelands, submerged lands and public trust lands. Only the CCC can grant a coastal development permit for development in areas of its retained jurisdiction. San Francisco's LCP is discussed further below as the *Western Shoreline Plan* in the Local Plans and Policies subsection.

Local Plans and Policies

Western Shoreline Area Plan

The Western Shoreline Area Plan of the San Francisco General Plan is the CCSF's certified Local Coastal Program and sets forth policies and objectives governing development in the coastal zone. Policies related to the Lake Merced area include preserving natural habitat, recreational facilities, passive activities, playgrounds, and vistas of the Lake Merced; maintaining a recreational pathway around the lake for multiple uses; and allowing only those activities that would not adversely affect the lake's water quality as a standby reservoir for emergency use.

With certification of the Local Coastal Program in 1984, the City obtained authority for issuance of coastal development permits (CDPs) for development activities within its coastal zone boundary. Today, most CDPs are issued by the San Francisco Planning Commission pursuant to San Francisco Planning Code Section 330 et seq. However, within the project area the CCC has retained jurisdiction over the waters of Lake Merced. In addition, City Planning Commission decisions regarding the issuance of CDPs for projects located within 100 feet of Lake Merced and associated wetlands are appealable to the CCC. The Western Shoreline Plan does not map any Environmentally Sensitive Habitat Areas (ESHAs)[150]. However, the CCC generally considers wetlands, lakes, and riparian habitats to be ESHAs because of the valuable role these areas play in maintaining the natural ecological functioning of many coastal habitat areas and because these areas are easily degraded by human developments.[151] Therefore, this analysis conservatively assumes that open waters, wetlands, and associated riparian vegetation within the project area are considered ESHAs.

San Francisco Recreation and Park Department Significant Natural Resources Areas Management Plan (SNRAMP)

As discussed in Section C.3.1, Plans and Policies, the SFRPD adopted the SNRAMP in 1995 to establish a maintenance and preservation program for designated significant natural resource areas in the CCSF. The SFRPD has proposed an update to this document; however it has not been finalized and adopted.[152] The 1995 SNRAMP staff report[153] set forth general objectives, policies, and management actions to guide development of the SNRAMP and to protect and enhance natural areas under the CCSF's jurisdiction. General policies and management actions presented in the approved 1995 plan relevant to biological resources at Lake Merced include the following:

III. General Policies and Management Actions

A. Vegetation

a. Maintain and promote indigenous plant species; propagate native plants using seed collected from the specific site to avoid alteration of unique genetic strains of native plant species

b. Control or remove invasive species; remove exotic plants that adversely affect indigenous plant growth

[150] Section 30107.5 of the Coastal Act provides a definition of environmentally sensitive area as: "Any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments. Section 30240 of the California Public Resources Code states: (a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas [and] (b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

[151] California Coastal Commission, 1981. Statewide Interpretive Guidelines For Wetlands And Other Wet Environmental Sensitive Habitat Areas.

[152] The SFRPD's proposed SNRAMP update is available on the SFRPD website.

[153] The San Francisco Recreation and Park Commission adopted the staff report on January 19, 1995, by Resolution No. 9501-008.

c. Enhance riparian areas

d. Reforest or replant areas where appropriate to maintain diversity of indigenous plant communities

e. Preserve habitat that supports wildlife

B. Water Resources

a. Maintain or improve water quality of streams and ponds

b. Protect riparian zones from erosion and sedimentation

c. Maintain drainage and erosion prevention devices along roads and service trails

d. Control drainage and runoff from roads

e. Establish and maintain tule encroachment zone around lakes

f. Use proper controls when using aquatic herbicide

San Francisco Public Works Code

The CCSF's Urban Forestry Ordinance (Article 16 of the Public Works Code) was enacted to ensure the protection of several categories of trees: street trees, significant trees, and landmark trees. There are no such trees, as defined by the ordinance, on the project site or that would be affected by the proposed project.

Special-Status Species

Federal Endangered Species Act

The federal Endangered Species Act (ESA) protects the fish and wildlife species and their habitats that the USFWS or NMFS has identified as threatened or endangered. The term endangered refers to species, subspecies, or distinct population segments that are in danger of extinction through all or a significant portion of their range. The term threatened refers to species, subspecies, or distinct population segments that are likely to become endangered in the near future.

The USFWS and NMFS administer the ESA. In general, the NMFS is responsible for protecting ESA-listed marine species and anadromous fishes (those that live in the sea but migrate upstream to spawn), which are not applicable to Lake Merced; listed, proposed, and candidate wildlife, plant species, and fish species are under USFWS jurisdiction. "Take"[154] of listed species can be authorized through either the Section 7[155]

[154] The ESA defines the term "take" as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

[155] Under Section 7, the federal lead agency must consult with the USFWS to ensure that the proposed action would not jeopardize endangered or threatened species or destroy or adversely modify designated critical habitat. If a project "may affect" a listed species or designated critical habitat, the lead agency is required to prepare a biological assessment evaluating the nature and severity of the expected effect. The USFWS then issues a biological opinion determining whether (1) the proposed action may either jeopardize the continued existence of one or more listed species or result in the destruction or adverse modification of critical habitat or (2) that the proposed action would not jeopardize the continued existence of any listed species or result in adverse modification of critical habitat.

consultation process (for actions by federal agencies) or the Section 10 permit process (for actions by non-federal agencies). Federal agency actions include activities on federal land or that are conducted by, funded by, or authorized by a federal agency (including issuance of federal permits and licenses).

Under the ESA, the Secretary of the Interior (or the Secretary of Commerce, as appropriate) formally designates critical habitat for certain federally listed species and publishes these designations in the *Federal Register*. Critical habitat is defined as the specific areas that are essential to the conservation of a federally listed species and that may require special management consideration or protection. However, there is no federally designated critical habitat within the project site.

California Endangered Species Act

Under the California Endangered Species Act (CESA), the CDFW has the responsibility for maintaining a list of threatened and endangered species (California Fish and Game Code, Section 2070). The CDFW also maintains a list of candidate species," which are those formally under review for addition to either the list of endangered species or the list of threatened species. In addition, the CDFW maintains a list of "species of special concern," which serves as a watch list.

The CESA prohibits the take of plant and animal species that the California Fish and Game Commission has designated as either threatened or endangered in California. "Take" in the context of the CESA means to hunt, pursue, kill, or capture a listed species, as well as any other actions that may result in adverse impacts when a person is attempting to take individuals of a listed species. The take prohibitions also apply to candidates for listing under the CESA. However, Section 2081 of the CESA allows the CDFW to authorize exceptions to the State's take prohibition for educational, scientific, or management purposes.

In accordance with the requirements of the CESA, an agency reviewing a project within its jurisdiction must determine if any State-listed endangered or threatened species could be present in the project area. The agency also must determine if the project could have a potentially significant impact on such species. In addition, the CDFW encourages informal consultation on any project that could affect a candidate species.

California Native Plant Protection Act

State listing of plant species began in 1977 with the passage of the California Native Plant Protection Act (CNPPA), which directed the CDFW to carry out the legislature's intent to "preserve, protect, and enhance endangered plants in this state." The CNPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare and to require permits for collecting, transporting, or selling such plants. The CESA expanded on the original CNPPA and enhanced legal protection for plants. The CESA established threatened and endangered species categories and grandfathered all rare animals—but not rare plants—into the act as threatened species. Thus, three listing categories for plants are employed in California: rare, threatened, and endangered.

Special-Status Natural Communities

The CDFW's Natural Heritage Division identifies special-status natural communities, which are those that are naturally rare and those whose extent has been greatly diminished through changes in land use. The CNDDB tracks 135 such natural communities in the same way that it tracks occurrences of special-status species: Information is maintained on each site for the natural community's location, extent, habitat quality, level of disturbance, and current protection measures. The CDFW is mandated to seek the long-term perpetuation of the areas in which these communities occur. While there is no statewide law that requires protection of all special-status natural communities, CEQA requires consideration of the potential impacts of a project on biological resources of statewide or regional significance.

Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA; United States Code, Title 16, Section 703, Supplement I, 1989) prohibits taking, killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. The ESA defines take as "…harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species." Harm may include significant habitat modification where it actually kills or injures a listed species through impairment of essential behavior (e.g., nesting or reproduction). Therefore, for projects that would not result in the direct mortality of birds, the MBTA is generally also interpreted in CEQA analyses as protecting active nests of all species of birds that are on the List of Migratory Birds, published in the *Federal Register* in 1995. With respect to nesting birds, while the MBTA itself does not provide specific take avoidance measures, the USFWS and CDFW over time have developed a set of measures sufficient to demonstrate take avoidance. Since these measures are typically required as permitting conditions by these agencies, they are often incorporated as mitigation measures for projects during the environmental review process. These requirements include avoiding tree removal during nesting season, preconstruction nesting bird surveys and establishment of appropriate buffers from construction if active nests are found.

California Fish and Game Code

Under Section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation under it. Section 3503.5 prohibits the take, possession, or destruction of any birds in the orders Falconiformes (hawks) or Strigiformes (owls), or of their nests and eggs. Code Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) allow the designation of a species as fully protected. This is a greater level of protection than that afforded by CESA. Except for take related to scientific research, all take of fully protected species is prohibited**.**

Special-Status Species in the Project Area

A list of special-status plant and animal species that could occur in the vicinity of the project area was compiled based on data described above in Approach to Analysis. Appendix B lists special-status plants and animals, their preferred habitats and plant blooming periods, and their potential to occur in the project area. Conclusions regarding habitat suitability and species occurrence are based on the results described in previous studies, the reconnaissance survey conducted by ESA on November 4, 2013, and the analysis of existing literature and database queries described above.

It was then determined whether there is a low, moderate, or high potential for species occurrence at the project site based on previous special-status species record locations and current site conditions. Only species with a moderate or high potential for occurrence are discussed further in this section. Species unlikely to occur within the project area due to lack of suitable habitat or range were eliminated from the discussion. Also eliminated from further discussion were special-status plant species considered to have low potential for occurrence and that were not identified during prior botanical surveys or during recent reconnaissance surveys for this project. Aquatic habitat suitable for fish species occurs in Lake Merced, next to the project site; however, all project activities would take place above the lake ordinary high water mark (OHWM) and are not anticipated to affect the water body; thus, no impacts on fish would occur. Special-status fish species are not included in Appendix B and were eliminated from further discussion.

Special-Status Plant Species

Most of the special-status plant species listed in Appendix B are considered to have a low potential to occur at the project site. No special-status plant species were observed during the biological resources reconnaissance survey conducted November 4, 2013. Although these reconnaissance surveys do not constitute a detailed botanical inventory of the project site, the overall potential of the site to support special-status plant species is considered low based on the lack of native plants and native plant habitats on the disturbed and heavily used project site.

The following special-status plant species were determined to have a moderate potential to occur on adjacent to the project site:

- San Francisco Bay spineflower (*Chorizanthe cuspidata* var. *cuspidata*)
- Blue coast gilia (*Gilia capitata* ssp. *chamissonis*)
- Locally significant species

San Francisco Bay spineflower. This CNPS List 1B.1 species occurs in northern coastal scrub communities and coastal dune habitats. It is known to occur in isolated locations around Impound Lake.[156] Suitable coastal scrub and dune habitat that could support this species is present within the project site.

Blue coast gilia. This CNPS List 1B.1 species also occurs in northern coastal scrub communities and coastal dune habitats. A single population is known at Impound Lake; however, there is suitable habitat on the project site.[157]

Locally rare species. Several species designated as locally rare by the Yerba Buena Chapter of the CNPS are also found at Lake Merced. These are dune tansy (*Tanacetum camphoratum*), San Francisco wallflower (*Erysimum franciscanum*), California pipevine (*Aristolochia californica*), Wight's paintbrush (*Castilleja wightii*), Vancouver rye (*Leymus* x *vancouverensis*), wild cucumber (*Marah oreganus*), canyon live oak (*Quercus chrysolepis*), coastal black gooseberry (*Ribes divaricatum*), and thimbleberry (*Rubus parviflorus*). These species occur in areas of dune scrub or coastal scrub in the Lake Merced watershed. Of these locally rare species only two have been documented in the vicinity of the project site: a dune tansy population on the southwestern shore of South Lake and a San Francisco wallflower population on the northeastern slope of Impound Lake.[158] Both dune tansy and San Francisco wallflower could occur within suitable habitat of the project site.

Special-Status Animals

The following special-status animal species were determined to have a moderate potential to occur in or next to the project site:

- Western pond turtle (*Actinemys marmorata*)
- Special-status, resident, and migratory birds
- Special-status bats

Western pond turtle. This is a California species of special concern. It inhabits rivers, streams, natural and artificial ponds, and lakes. Adjacent terrestrial habitat is also critical for egg laying, winter refuge, and dispersal. This species is known to occur at Lake Merced, and suitable habitat is present in South Lake, bordering the project site.[159]

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156 Nomad Ecology, 2011. Lake Merced Vegetation Mapping Update, Lake Merced Natural Area, City and County of San Francisco, California, revised draft. Prepared for San Francisco Public Utilities Commission, May 2011.
157 Ibid.
158 Ibid.
159 San Francisco Public Utilities Commission (SFPUC), *Lake Merced Watershed Report*, January 2011.

Special-status birds. Bank swallow (*Riparia riparia*) is a California threatened species. It is known to nest in the sandy bluffs north of Fort Funston and to forage over the open waters. This species has the potential to move through the project site while foraging over South Lake. Saltmarsh common yellowthroat (*Geolthlypis trichas sinuosa*) is a former federal species of concern and is a current California species of special concern. It is known to nest in the riparian wetlands along the periphery of Lake Merced.[160] Tricolored blackbirds (*Agelaius tricolor*), a California species of special concern, intermix with flocks of red-winged blackbird which visit Lake Merced throughout the year.[161] Yellow warbler, a California species of special concern, has also been documented in vegetation surrounding the Lake.[162] In addition, a rookery of double-crested cormorant ~~(*Phalacrocorax auritus*)~~, a species on the CDFW Watch List, is approximately 0.2 mile northwest of the project site. The rookery is in the eucalyptus trees on the north side of the San Francisco Police Department firing range, which is also on the southwest shore of South Lake.[163,164]

Resident and Migratory birds. Several resident and migratory birds that do not have special-species status could nest in or next to the project site in trees, shrubs, and buildings. Several raptors are known to nest in San Francisco in suitable habitat, which is also present on the project site. These species may include red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), American kestrel (*Falco sparverius*), Cooper's hawk (*Accipiter cooperi*), and great horned owl (*Bubo virginianus*).[165] Additional native birds nest in the area, such as great blue heron ~~(*Andea herodias*)~~[166], marsh wren ~~(*Cistothorus palustris*)~~, black phoebe ~~(*Sayornis nigricans*)~~, pygmy nuthatch (*Sitta pygmaea*), Anna's hummingbird (*Calypte anna*), and white-crowned sparrow ~~(*Zonotrichia leucophrys*)~~.[167] The MBTA and California Fish and Game Code protect raptors, most native migratory birds, and breeding birds that would occur at the project and/or nest in the vicinity.

Special-status bats. Several bat species are listed as a California species of special concern or California special animals. They are either known to occur or have the potential to occur around Lake Merced. These are the western red bat (*Lasiurus blossevillii*) and Yuma myotis (*Myotis yumanensis*). Suitable roosting habitat for these bats is open spaces within buildings and sheds, in tree foliage, underneath the

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160 CDFW, 2013. California Natural Diversity Database Rarefind 4. Biogeographic Data Branch, Sacramento. Data dated October 31, 2013.

161 eBird, 2012. E.Bird: An online database of bird distribution and abundance. eBird,Itheca, NY. http://www.ebird.org. Data accessed August 1, 2014.

162 *Ibid.*

163 Murphy, D. P., *Breeding Bird Records for Lake Merced, San Francisco, California: 1997, 1998, 1999*, Golden Gate Audubon Society, July 19, 1999. http://www.lmtf.org/FoLM/Data/bird_listing.html. Accessed June 18, 2012.

164 San Francisco Recreation and Park Department (SFRPD), 2006. *Significant Natural Resource Areas – Final Draft*, February 2006.

165 San Francisco Field Ornithologists, *San Francisco Breeding Bird Atlas - Draft*, last revised June, 2003.

166 Kelly, J.P., et. Al., *Annotated Atlas and Implications for the Conservation of Heron and Egret Nesting Colonies in the San Francisco Bay Area*, Audubon Canyon Ranch, August 2006. Available at http://www.egret.org/googleearthheronries

167 San Francisco Field Ornithologists, *San Francisco Breeding Bird Atlas - Draft*, last revised June, 2003.

exfoliating bark of trees, and in tree cavities. Those conducting bat surveys in natural areas and parks in San Francisco found that the three most commonly encountered species in the area are Mexican free-tailed bat (*Tadaridia brasiliensis*), Yuma myotis, and western red bat.[168] While Mexican free-tailed bats, which have no special status, were widespread and abundant throughout the sampled natural areas, Yuma myotis and western red bat were much less abundant and generally were restricted to parks with lakes. Yuma myotis and Mexican free-tailed bats were the only species recorded in a 2009 survey at Lake Merced, and the documented population was very low.[169]

There were no signs of bat roosts, such as observations of actual bats, bat guano, bat urine staining, or sounds of roosting bats, in trees or buildings on the project site during the November 4, 2013, reconnaissance survey. However, bats could be present seasonally in any of the buildings at the project site, or in tree foliage, in tree cavities, or under the loose, peeling bark of trees on or near the site.

Impact Analysis

Impact BI-1: The project could have a substantial adverse effect, either directly or through habitat modifications, on species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS. (Less than Significant with Mitigation)

The project could have potentially significant adverse impacts on special-status plant and wildlife species that are known to occur or have a moderate or high potential to occur within or adjacent to the project site. Suitable habitat that may support special-status plant species, western pond turtle, nesting and migratory birds, western red bat, and Yuma myotis occurs next to or on the project site. The project could adversely affect these special-status species and their associated habitat by modifying the existing vegetation communities and habitat, disrupting foraging and nesting efforts, or interfering with wildlife movement. Implementation of the mitigation measures described below would reduce potential impacts on special-status plant and wildlife species to a *less-than-significant* level by avoiding and reducing habitat disturbance where feasible, excluding wildlife from entering the project site during remediation, and avoiding disturbance to nesting birds and roosting bats through seasonal work limits or buffers around active nests or roosts.

<u>Fugitive dust from project excavation and backfilling activities could affect the air and water quality of surrounding habitat utilized by special-status and common wildlife species. As discussed in Impact AQ-1 in Section 7, Air Quality, the project is subject to the San Francisco Construction Dust Control Ordinance</u>

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[168] Krauel, J. K., *Foraging Ecology of Bats in San Francisco*, M.S. thesis, San Francisco State University. Available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2001.0016E, 2009.
[169] Ibid.

which requires implementation of a project-specific Dust Control Plan that includes dust suppression measures and air monitoring during construction (refer to Section 7, Air Quality for further details). In addition, the project would comply with the State Water Resources Control Board (SWRCB) Construction General Stormwater Permit designed to prevent sediment and stormwater pollutants from moving offsite into Lake Merced. The requirements of the Construction General Stormwater Permit are discussed in Impact HY-1, in Section E. 15, Hydrology and Water Quality. Compliance with these regulations will reduce the potential for deterioration of air quality and water quality which could affect special-status and common wildlife species in the vicinity of the project site to a *less-than-significant* level.

Information on potential project impacts on special-status species and associated habitat is presented in the following subsections.

Special-Status Plants

The overall potential of the project site to support special-status plants is low, based on the lack of native plants and native plant communities and the high degree of disturbance from current and historical site uses. However, suitable vegetation communities, or remnants thereof, that could support special-status plant species (San Francisco Bay spineflower, blue coast gilia, San Francisco wallflower, and dune tansy) are present at the project site. Coastal dune scrub, which could support these species, is present between the disturbed skeet and trap fields and the riparian bank vegetation along the north boundary of the project site. Disturbing this fringe habitat during remediation could result in a direct loss of special-status plants or loss of habitat for these species, which would be a *significant impact*. Implementation of **Mitigation Measures MBI-1a, Protocol Surveys for Special-Status Plants in 2014**, **M-BI-1b, Relocation of Special-Status Plants**, and **MBI-1c, Worker Environmental Awareness Program Training**, would reduce potential impacts on special-status plants to a *less-than-significant* level by requiring surveys of the project site to identify and protect individual plants and delineate suitable habitat in advance of final project design. In addition, all project participants would be trained on sensitive environmental resources in the project vicinity (e.g. special-status plants and wildlife with potential to occur onsite and adjacent sensitive habitat areas and vegetation communities) and the protection and avoidance measures to be implemented onsite throughout the duration of the project.

Mitigation Measure MI-BI-1a: Protocol Surveys for Special-Status Plants.

The SFPUC shall retain a qualified botanist to conduct preconstruction CDFG protocol-level[170] surveys for special-status plants (in particular San Francisco Bay spineflower, blue coast gilia, San Francisco wallflower, and dune tansy) on the project site and adjacent suitable habitat during the

[170] CDFG, 2009. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. Biogeographic Data Branch, Sacramento. Data dated November 24, 2009.

blooming period for these species. Surveys shall occur in the spring for San Francisco Bay spineflower (April – July), blue coast gilia (April – July), and San Francisco wallflower (March – June), and in the late summer for dune tansy (July – October).

Survey results shall be mapped and documented in a technical memorandum and provided to the Planning Department. If no special-status plants are identified during surveys, then these plants shall be assumed to be absent from the project site. If special-status plants are found during surveys, suitable habitat shall be mapped for avoidance in order to account for seasonal growth variability from year to year, when plants may not bloom but remain present in the seed bank. Suitable habitat areas shall be demarcated by a qualified botanist with flagging or orange fencing with signs that read "Environmentally Sensitive Area – Keep Out." These markings shall be installed before construction begins and continuously maintained throughout construction.

Mitigation Measure M-BI-1b: Relocation of Special-Status Plants.

If special-status plants are located within the remediation site and cannot be avoided during remediation, then a plan shall be developed in coordination with CDFW to relocate them to suitable habitat within the Lake Merced shoreline area. This can be done either through salvage and transplanting or by collection and propagation of seeds or other vegetative material. Any plant relocation would be done under the supervision of a qualified botanist.

Mitigation Measure M-BI-1c: Worker Environmental Awareness Program Training.

A project-specific Worker Environmental Awareness Program (WEAP) training shall be developed and implemented by a qualified biologist for the project and attended by all construction personnel prior to beginning work onsite. The training could consist of a recorded presentation that could be reused for new personnel. The WEAP training shall generally include but not be limited to the following:

- Applicable State and federal laws, environmental regulations, project permit conditions, and penalties for non-compliance;
- Special-status plant and wildlife species with potential to occur on or in the vicinity of the project site, avoidance measures, and a protocol for encountering such species including a communication chain;
- Preconstruction surveys and biological monitoring requirements associated with each phase of work;
- Known sensitive resource areas in the project vicinity which are to be avoided and/or protected (e.g. wetlands) as well as approved project work areas; and
- Best Management Practices (BMPs) and their location on the project site for erosion control and/or species exclusion.

Special-Status Reptiles

There is suitable aquatic habitat for western pond turtle in South Lake, but the project would not directly affect this aquatic habitat. Considering the high degree of disturbance from ongoing and past uses of the project site, upland dispersal habitat for this species is of marginal quality. However, due to the proximity of aquatic habitats to the site, western pond turtle could utilize the site for dispersal or migratory movement to aquatic features in the immediate area. As such, project construction could adversely affect this species by direct mortality or upland habitat removal. Implementation of **Mitigation Measure M-BI-1c, Worker Environmental Awareness Program Training**, and **Mitigation Measure M-BI-1d, Avoidance and Minimization Measures for Western Pond Turtle** would reduce potential impacts on this species to a *less-than-significant* level by educating workers on this species and its presence in the project vicinity, requiring the installation of exclusion fencing around the project site, by conducting preconstruction surveys, and by requiring additional protection measures during site remediation.

Mitigation Measure M-B1d: Avoidance and Minimization Measures for Western Pond Turtle.

During construction at the project site, the SFPUC shall ensure a biological monitor is present during installation of exclusion fencing and initial vegetation clearing and grading. Also, the following measures shall be implemented:

- Within one week before construction commences, a qualified biologist shall supervise the installation of exclusion fencing along the boundaries of the work area, as the biologist deems necessary to prevent western pond turtles from entering the work area. The construction contractor shall install CDFW-approved species exclusion fencing, with a minimum height of 3 feet above ground surface and with an additional 4–6 inches of fence material buried such that species cannot crawl under the fence. Fencing installed along the north border (lakeside border) of the site can be multipurpose silt fencing (see Mitigation Measure M-BI-3, Wetland Protection, below) and exclusion fencing.

- A qualified biologist shall survey the project area within 48 hours before the onset of initial ground-disturbing activities and shall be present during initial vegetation clearing and ground-disturbing activities. The biological monitor shall monitor the exclusion fencing weekly to confirm proper maintenance and inspect for turtles. If western pond turtles are found, the SFPUC shall halt construction in the vicinity that poses a threat to the individual as determined by the qualified biologist. If possible, the individual shall be allowed to move out of the project area of its own volition (e.g., if it is near the exclusion fence that can be temporarily removed to let it pass). The qualified biologist shall relocate turtles to the nearest suitable habitat should they not leave the work area of their own accord. Construction shall resume after the individual is out of harm's way. If western pond turtles occur repeatedly onsite after the exclusion fencing has been installed, a qualified biologist shall initiate preconstruction sweeps of the project site for this species prior to start of construction on a daily basis and thereinafter throughout the duration of the project.

- During project activities, excavations deeper than 6 inches shall have a sloping escape ramp of earth or a wooden plank installed at a 3:1 rise; openings, such as pipes, where western pond turtles might seek refuge shall be covered when not in use; and all trash that may attract predators or hide western pond turtles shall be properly contained each day, removed from the worksite, and disposed of regularly. Following site remediation, the construction contractor shall remove all trash and construction debris from the work areas.

Special-Status and Migratory Birds

Construction activities, especially those that involve ground disturbance and the use of heavy machinery, may adversely affect nesting bird species within ¼-mile of the project during the nesting season (February 1–August 30). Bank swallow (a California threatened species), tricolored blackbird, yellow warbler, and salt marsh common yellowthroat (California species of special concern), and double-crested cormorant (California watch list species) are known to forage or nest in the project vicinity. Migratory and native raptor and passerine (perching) bird species are also known to forage and/or nest in the mature non-native forest, scrub, and riparian habitats on or next to the project site.

Removal of scrub vegetation, mature trees, and structures at the project site could destroy active bird nests. In addition, adverse effects, such as noise and visual disturbance, could disrupt nesting efforts in these habitats. The loss of an active nest would be considered a significant impact under CEQA, if that nest were occupied by a special-status bird species. Moreover, disruption of nesting migratory or native birds is not permitted under the federal MBTA or the California Fish and Game Code, as it could constitute unauthorized take. Thus, the loss of any active nest by, for example, removing a tree or shrub or demolishing a structure containing a nest, must be avoided under federal and California law. Although compliance with these existing state and federal regulations would prevent impacts on nesting birds, implementation of **Mitigation Measure M-BI-1e, Nesting Bird Protection Measures**, would further ensure that the project would not have a significant impact on nesting birds by requiring removal of vegetation and structures outside of the bird nesting season, to the extent feasible, and establishing no work buffer zones around active nests on or near the project site.

Mitigation Measure M-BI-1e: Nesting Bird Protection Measures.

Nesting birds and their nests shall be protected during construction by use of the following:

- Removal of trees, scrub vegetation and structures shall occur outside the bird nesting season (February 1 to August 30), to the extent feasible.
- If removal of trees, scrub vegetation, or structures during bird nesting season cannot be fully avoided, a qualified wildlife biologist shall conduct preconstruction nesting surveys within seven days prior to the start of such activities or after any construction breaks of 14 days or more. Surveys shall be performed for the project site and suitable habitat within 250 feet of the project site in order to locate any active passerine (perching bird) nests and within 500 feet of the project site to locate any active raptor (birds of prey) nests or double-crested cormorant or heron rookeries.
- If active nests are located during the preconstruction bird nesting survey, the wildlife biologist shall evaluate if the schedule of construction activities could affect the active nests and the following measures shall be implemented based on their determination:
    - If construction is not likely to affect the active nest, it may proceed without restriction; however, a biologist shall regularly monitor the nest to confirm there is no adverse effect

and may revise their determination at any time during the nesting season. In this case, the following measure would apply.

- If construction may affect the active nest, the biologist shall establish a no disturbance buffer. Typically, these buffer distances are between 25 feet and 250 feet for passerines and between 300 feet and 500 feet for raptors. These distances may be adjusted depending on the level of surrounding ambient activity (.e.g., if the project area is adjacent to a road or active trail) and if an obstruction, such as a building, is within line-of-sight between the nest and construction. For bird species that are federally and/or state-listed sensitive species (i.e., fully protected, endangered, threatened, species of special concern), an SFPUC representative, supported by the wildlife biologist, shall consult with the USFWS and/or CDFW regarding modifications to nest buffers, prohibiting construction within the buffer, modifying construction, and removing or relocating active nests that are found on the site.

- Removing inactive passerine nests may occur at any time. Inactive raptor nests shall not be removed unless approved by the USFWS and/or CDFW.
- Removing or relocating active nests shall be coordinated by the SFPUC representative with the USFWS and/or CDFW, as appropriate, given the nests that are found on site.
- Any birds that begin nesting within the project area and survey buffers amid construction activities are assumed to be habituated to construction-related or similar noise and disturbance levels and no work exclusion zones shall be established around active nests in these cases.

Special-Status Bats

Clearing vegetation (including trees) and removing structures could result in direct mortality of special-status bats roosting within the project site. Direct mortality of special-status bats would be a significant impact. Implementing **Mitigation Measure M-BI-1f, Avoidance and Minimization Measures for Special-Status Bats**, would reduce potential impacts on special-status bats to a *less-than-significant* level by requiring preconstruction surveys and implementing avoidance measures if potential roosting habitat or active roosts are located.

Mitigation Measure M-BI-1f: Avoidance and Minimization Measures for Special-Status Bats.

In coordination with the SFPUC, a preconstruction survey for special-status bats shall be conducted by a qualified biologist in advance of tree and structure removal within the project site to characterize potential bat habitat and identify active roost sites. Should potential roosting habitat or active bat roosts be found in trees and/or structures to be removed under the project, the following measures shall be implemented:

- Removal of trees and structures shall occur when bats are active, approximately between the periods of March 1 to April 15 and August 15 to October 15; outside of bat maternity roosting season (approximately April 15 – August 31) and outside of months of winter torpor (approximately October 15 – February 28), to the extent feasible.
- If removal of trees and structures during the periods when bats are active is not feasible and active bat roosts being used for maternity or hibernation purposes are found on or in the immediate vicinity of the project site where tree and structure removal is planned, a no-

disturbance buffer of 100 feet shall be established around these roost sites until they are determined to be no longer active by the qualified biologist.

- The qualified biologist shall be present during tree and structure removal if active bat roosts are present. Trees and structures with active roosts shall be removed only when no rain is occurring or is forecast to occur for 3 days and when daytime temperatures are at least 50°F.
- Removal of trees with active or potentially active roost sites shall follow a two-step removal process:
  1. On the first day of tree removal and under supervision of the qualified biologist, branches and limbs not containing cavities or fissures in which bats could roost, shall be cut only using chainsaws.
  2. On the following day and under the supervision of the qualified biologist, the remainder of the tree may be removed, either using chainsaws or other equipment (e.g. excavator or backhoe).
- Removal of structures containing or suspected to contain active bat roosts shall be dismantled under the supervision of the qualified biologist in the evening and after bats have emerged from the roost to forage. Structures shall be partially dismantled to significantly change the roost conditions, causing bats to abandon and not return to the roost.
- Bat roosts that begin during remediation are presumed to be unaffected, and no buffer would be necessary.

Habitat Modification through Upland Vegetation Removal

Riparian and wetland habitat types are discussed in Impacts BI-2 and BI-3, below. This discussion focuses on upland vegetation within the project area.

Much of the project site is comprised of non-native grass and weed species. These areas include most of the open areas between the PRGC buildings, parking lot, and trap and skeet fields, which encompass much of the proposed remediation area. Removal and disturbance of this vegetation would not result in loss of sensitive vegetation or habitat. However, it is noted that the project site would be hydroreseeded with native plant species following remediation activities, as discussed in Section A.4.8, Backfilling and Site Restoration.

A tree survey[171] of the project site identified a total of 88 trees on the project site: 27 Australian blackwood, 43 blue gum eucalyptus, 2 Monterey cypress, and 16 Monterey pine. Of these 88 trees, 81 are to be removed under the project, while up to 7 trees may be retained due to their proximity to structures. The trees are primarily within either a dense stand on the northwest boundary of the project site or along the southeast property border. While most of these trees are non-native species, collectively they create a

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[171] AMEC Environment & Infrastructure, Inc., 2013. Tree Survey – Pacific Rod and Gun Club, San Francisco California. Prepared for the City and County of San Francisco. November, 2013.

mature forest habitat with abundant nesting substrate suitable for breeding birds and special-status bats. Neither of these stands is historically known to host a double-crested cormorant rookery, but they do provide suitable nesting opportunities for this species, as well as for raptors and passerines.

Direct impacts on breeding birds and special-status bats would be avoided by implementing preconstruction nesting bird surveys and creating no-disturbance buffer areas surrounding active nests, as described in Mitigation Measure M-BI-1d, Nesting Bird Protection Measures, and Mitigation Measure M-BI-1e, Avoidance and Minimization Measures for Special-Status Bats. Nevertheless, loss of this habitat for nesting birds and bats could have indirect adverse effects on wildlife. However, abundant similar habitat is available in the Lake Merced area, and could be used by various avian and bat species. The DEIR for the proposed update to the SNRAMP reports that there are approximately 12,000 non-native blue eucalyptus trees (*Eucalyptus globulus*) in the Lake Merced area.[172] A dense stand of these trees is next to the northwest site boundary, south of the San Francisco Police Department firing range. In the overall context of available nesting and roosting habitat in the Lake Merced vicinity, the removal of about 81 trees would be negligible. Considering the abundant, similar, mature forest habitat in the Lake Merced watershed, impacts on wildlife from reduction in available habitat would be *less than significant*.

Impact BI-2: The project could have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS. (Less than Significant with Mitigation)

Project construction would encroach upon 0.389 acre of upland coastal scrub and 0.647 acre of arroyo willow riparian scrub habitat located along the banks of Lake Merced. Runoff associated with other construction activities such as materials staging, stockpiling, vehicle and equipment parking, could also result in adverse effects on this sensitive habitat. The coastal scrub and arroyo willow riparian vegetation communities on the banks of Lake Merced and within the project footprint provide valuable foraging and cover benefits for resident wildlife and the loss of such habitat would be considered a significant impact. In addition, these areas would likely be considered as ESHAs according to CCC standards. Implementing **Mitigation Measure M-BI-2, Restoration of Coastal Scrub, Riparian Scrub, and Wetlands** at the project site would reduce the impact to a *less-than-significant* level by restoring affected vegetation following construction.

Mitigation Measure M-BI-2: Restoration of Coastal Scrub, Riparian Scrub, and Wetlands.

The habitat functions and services of all coastal scrub habitat, arroyo willow riparian scrub habitat, and freshwater emergent wetlands affected during construction shall be restored in-place to pre-

[172] San Francisco Planning Department, 2011. Significant Natural Resources Area Management Plan Draft Environmental Impact report, Planning Department Case No. 2005.1912E, August 2011.

project conditions. A Riparian and Wetland Restoration and Mitigation Monitoring Plan shall be prepared for the affected areas, subject to approval by the appropriate regulatory agencies, and shall generally include, but not be limited, to the following:

- A final grading plan for the affected coastal scrub habitat, riparian scrub habitat, and wetlands which would restore the topography of the affected habitat areas to pre-project conditions;
- A planting plan, composed of native coastal scrub, riparian scrub, and freshwater emergent wetland plant species, consistent with the coastal scrub, riparian habitat and wetlands of Lake Merced;
- A weed control plan to prevent the spread of invasive non-native plant species on the project site;
- Performance criteria for the revegetated areas that establish success thresholds over a specific amount of time (typically five years) as determined by the regulatory agencies with jurisdiction over the affected areas;
- A monitoring and reporting program under which progress of the revegetated areas shall be tracked to ensure survival of the mitigation plantings. The program shall document overall health and vigor of mitigation plantings throughout the monitoring period and provide recommendations for adaptive management as needed to ensure the site is successful, according to the established performance criteria. An annual report documenting monitoring results and providing recommendations for improvement throughout the year shall be provided to the regulatory agencies; and
- A best management practices element describing erosion control measures to be installed around the affected areas following mitigation planting in order to avoid sediment runoff into the adjacent waters of Lake Merced.

In addition, implementing **M-BI-3, Wetland Protection**, as described below, would isolate project activities to the project footprint with the installation of exclusion fencing and stormwater BMPs, thereby protecting the remaining habitat which surrounds the project site during construction activities.

Impact BI-3: The project could have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act and state protected wetlands. (Less than Significant with Mitigation)

The project site is located adjacent to jurisdictional wetland features, consisting of freshwater emergent wetlands along the banks of South Lake. Project remediation would directly affect approximately 0.1 acre of wetlands and other waters of the United States and approximately 0.835 acre of waters of the State of California, which would be a significant impact. Additionally, project activities such as grading and excavation would generate loose, erodible soils which could result in erosion or siltation in South Lake and its associated wetlands. In the case of soil erosion or an accidental release of deleterious materials during construction, the project could indirectly impact water quality, a significant impact.

Implementing **Mitigation Measure M-BI-3, Wetland Protection** and **Mitigation Measure M-BI-2, Restoration of Coastal Scrub, Riparian Scrub, and Wetlands**, at the project site would reduce the impact to a less-than-significant level. This measure requires installation of a protective barrier at the border of the state and federal jurisdictional wetlands and the project area to ensure that project activities do not affect jurisdictional wetlands. This sediment barrier could also serve as exclusion fencing for western pond turtle and common wildlife as long as it meets the CDFW standards for species exclusion fencing (see Mitigation Measure M-BI-1c, Avoidance and Minimization Measures for Western Pond Turtle, above). In addition, the project is subject to the SWRCB General Construction Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (see Section 15, Hydrology and Water Quality). This permit requires a minimum level of construction water quality BMPs and monitoring to protect receiving waters from construction-related pollutants, stormwater, and sediment erosion and runoff. These BMPs would be specified in the project-specific stormwater pollution prevention plan (SWPPP) that would be submitted and reviewed by the RWQCB before the start of remediation. With compliance with stormwater regulations, implementation of Mitigation Measure M-BI-2, and implementation of Mitigation Measure M-BI-3, this impact would be *less than significant with mitigation*.

Mitigation Measure M-BI-3: Wetland Protection.

At the project site, wetland protection measures shall be applied to protect state and federal jurisdictional wetlands. These measures shall include the following:

- A protective barrier (such as silt fencing) shall be erected around the adjacent wetland feature to isolate it from remediation activities;
- Signage shall be installed on the fencing to identify sensitive habitat areas and restrict construction activities;
- No equipment mobilization, grading, clearing, or storage of equipment or machinery, or similar activity shall occur at the project site until a representative of SFPUC has inspected and approved the wetland protection fencing; and
- The SFPUC shall ensure that the temporary fencing is continuously maintained until all remediation is completed.

A fencing material meeting the requirements of both water quality protection and wildlife exclusion may be used.

Impact BI-4: The project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (Less than Significant)

Project activities would not interfere with the movement of native or migratory fish; all aquatic and riparian habitats would be avoided. Although there are no known migration corridors in the project site, the project could temporarily limit the movements of some terrestrial wildlife (for example, western pond turtle) during construction. However, the project would not result in any permanent barriers to species movement, and migratory corridors for fish and wildlife would be unaffected; therefore, the project would result in a *less-than-significant* impact.

Impact BI-5: The project would not conflict with applicable local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (No Impact)

The project would require the removal of about 81 trees; however, none of the trees are street trees, significant trees, or landmark trees as defined under the San Francisco Urban Forestry Ordinance (Article 16 of the San Francisco Public Works Code). In addition, the project would not conflict with the general management policies of the 1995 SNRAMP. Therefore, the project would not conflict with local policies or ordinances protecting biological resources and there would be *no impact*.

Impact C-BI: The project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, could result in significant cumulative impacts on biological resources. (Less than Significant with Mitigation)

The geographic context for the analysis of cumulative impacts on biological resources generally encompasses the open space areas around Lake Merced, and considers the projects listed in Table 3.

Potential project impacts on biological resources could include those on special-status species: special-status plants, western pond turtle, special-status and migratory birds, and special-status bats. The removal of trees could affect habitat that provides potential foraging opportunities, cover, and nesting and roosting habitat for birds and bats. There also could be direct and indirect impacts on coastal scrub and riparian habitat, wetlands, and aquatic habitats. Past cumulative projects, including the development of civic facilities, residences, commercial and industrial areas, and infrastructure, have already caused substantial adverse cumulative changes to biological resources in San Francisco. For example, the project area was converted from its original sand dune habitat beginning over a century ago, with a nearly complete loss of the original habitat types and many of the species that once occurred there. Revegetated areas have matured over time and provide habitat for both native and non-native plant and animal species. However, the diversity of species in these revegetated areas is often simplified and the areas support a different suite of species than once existed. Overall, this is true of many areas throughout the region.

Not all projects listed in Table 3 would affect biological resources, and many of those would be temporary impacts associated with construction. Most current and reasonably foreseeable projects that could result in significant cumulative construction impacts on biological resources are those that would be implemented in the Lake Merced area. These projects include infill development or renovation of facilities, such as the Fort

Funston Site Improvements, Vista Grande Drainage Basin Improvement Plan, the Parkmerced Project, and the San Francisco State University Master Plan. Other projects with potential cumulative impacts are the construction of new pipelines and facilities for the San Francisco Westside Recycled Water Project and the San Francisco Groundwater Supply Project. These projects would primarily have temporary construction-related impacts on biological resources and are not expected to convert or remove more than minor areas of habitat for plants and wildlife. The San Francisco Groundwater Supply Project could result in long-tem effects on wetlands as a result of groundwater pumping operations. Other projects, such as the Golden Gate National Recreation Area Management Plan, and the proposed update to the SNRAMP, would include elements likely to result in beneficial effects on biological resources. Conservatively, this analysis assumes that there could be a significant cumulative impact on biological resources from the combination of these projects, given the historical impacts on biological resources in the vicinity.

The contribution of the proposed project to significant cumulative biological resources impacts could be considerable, due to the project's potential to cause significant, project-specific impacts on sensitive biological resources. However, implementing **Mitigation Measures M-BI-1a through M-BI-1f, M-BI-2, and M-BI-3** would avoid or substantially minimize the project's effect on special-status species, coastal scrub and riparian habitat, and wetlands. As a result, these measures would reduce the project's contribution to cumulative impacts on biological resources to a less-than-cumulatively considerable level with mitigation (*less than significant with mitigation*).

E.14 Geology and Soils

Topics:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Not Applicable*
14. GEOLOGY AND SOILS— Would the project:					
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42.)	☐	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒	☐
iv) Landslides?	☐	☐	☐	☒	☐

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐	☐
c) Be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property?	☐	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☐	☒
f) Change substantially the topography or any unique geologic or physical features of the site?	☐	☐	☒	☐	☐

The project would not build any structures or facilities and thus would not be adversely affected by expansive soil, and would not include use septic tanks or alternative onsite wastewater disposal systems; therefore, Topics E.14(d) and E.14(e) are not applicable.

The project site is on the southwest shore of Lake Merced. Geologic units at the site include artificial fill closest to the lake edge and the Pleistocene-age Colma Formation in the remainder of the project area.[173] The Colma Formation is regionally described as friable well-sorted sand containing few beds of sandy silt, clay, and gravel. Lake Merced is incised into the Colma Formation, which constitutes the shallowest aquifer in the Westside Groundwater Basin, where the project is located.

Impact GE-1: The project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, seismic groundshaking, seismically induced ground failure, or landslides. (No Impact)

Fault Rupture

The Alquist-Priolo Earthquake Fault Zone for the San Andreas Fault is more than 2 miles south of the project site.[174] There are no earthquake fault zones or active or potentially active faults on or in the immediate vicinity of the site. Therefore, there would be *no impact*.

[173] Bonilla, M. G., 1998. Preliminary Geologic Map of the San Francisco South 7.5' Quadrangle and Part of the Hunters Point 7.5' Quadrangle, San Francisco Bay Area, California.

[174] California Department of Conservation, Division of Mines and Geology, 1982. State of California Special Studies Zones, San Francisco South, Revised Official Map. January 1, 1982.

Groundshaking

Based on shaking hazard mapping by the Association of Bay Area Governments, the project site could experience violent groundshaking in an earthquake on one of the regional faults.[175,176] However, the project does not include the construction of any new structures, and it would not increase the number of visitors to the site. Further, as discussed in Section A, Project Description, excavations conducted during soil remediation would be backfilled with clean fill that would be compacted to engineering standards (see Section A.4.8, Backfilling and Site Restoration); this would reduce the amplification of shaking hazards. Therefore, there would be *no impact*.

Liquefaction, Lateral Spreading, and Earthquake-Induced Settlement

The project site is located in an area of liquefaction potential identified by the California Department of Conservation under the Seismic Hazards Mapping Act of 1990.[177] The upland remediation area roughly abuts a sloped area along the Lake Merced shoreline on the north; therefore, the site could be subject to liquefaction, earthquake-induced settlement, and lateral spreading. However, the USGS has mapped this area as having a low liquefaction potential.[178] Further, the project does not include the construction of any new structures and would not increase the number of visitors to the site that could be adversely affected by liquefaction and its related effects. Therefore, there would be *no impact*.

Earthquake-Induced Landslides

With the exception of slopes along the lake shore, the project site is relatively flat. No areas of mapped earthquake-induced landslide susceptibility identified by the California Department of Conservation under the Seismic Hazards Mapping Act of 1990 are located within the project site.[179] Therefore, there would be *no impacts* from earthquake-induced landslides.

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175 Association of Bay Area Governments, Hazard Maps, San Francisco County Earthquake Hazard, San Francisco County Hazard Map. http://quake.abag.ca.gov/earthquakes/sanfrancisco/. Accessed November 15, 2013.

176 Shaking hazard maps provided by the Association of Bay Area Governments show likely shaking intensity in any 50-year period from all possible faults. It is the equivalent risk to a 500-year flood. The Association of Bay Area Governments selected this interval because it most closely aligns to the levels of shaking the current building code is designed to withstand.

177 California Department of Conservation, Division of Mines and Geology, 2000. *State of California Seismic Hazard Zones*, City and County of San Francisco, Official Map, November 17, 2000.

178 US Geological Survey, 2006. Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region, California, Open-File Report 06-1037, 2006.

179 California Department of Conservation, Division of Mines and Geology, 2000. State of California Seismic Hazard Zones, City and County of San Francisco, Official Map, November 17, 2000.

Impact GE-2: The project would not result in substantial erosion or loss of topsoil. (Less than Significant)

Excavation conducted as part of the upland soil remediation could create the potential for wind- and water-borne soil erosion. However, as discussed in Section E.15, Hydrology and Water Quality (Impact HY-1), the project would implement the erosion and sediment controls specified in the Construction General Stormwater Permit, which would ensure that substantial erosion does not occur during construction. Once excavation has been completed and confirmation sampling confirms that the cleanup criteria have been met, the excavations would be backfilled with clean fill. This would be compacted to engineering standards, and the disturbed area would be hydroseeded to encourage revegetation, as discussed in Section A, Project Description. With appropriate backfilling and hydroseeding of the disturbed areas, there would be a low potential for soil erosion once the project is completed (see Section A.4.8, Backfilling and Site Restoration). Therefore, impacts from soil erosion during and following construction would be *less than significant*.

Topsoil is a fertile soil horizon that typically contains a seed base. The project site is an active skeet shooting range, and most of the soil surface is disturbed or covered with broken targets and shooting debris; other areas are paved. Therefore, there is not a well-developed topsoil horizon within the project site. Further, the site would be restored with imported topsoil and revegetated following removal of contaminated soils. Therefore, impacts from the loss of topsoil would be *less than significant*.

Impact GE-3: The project site would not be located on a geologic unit or soil that is unstable or that could become unstable as a result of the project. (Less than Significant)

Excavations would be conducted to depths of up to 7 feet within the upland remediation area; limited ground settlement could result next to the excavations. However, there are no adjacent structures that could be adversely affected by small amounts of ground settlement. Also, as discussed in the Section A, Project Description, following remediation the excavations would be backfilled to original grade with clean fill. This would be compacted to engineering standards, which would reduce the potential for future settlement once construction is complete. Therefore, potential impacts related to construction on a geologic unit that could become unstable as a result of the project would be *less than significant*.

Impact GE-4: The project would not substantially change the topography or any unique or physical feature. (Less than Significant)

The project site, which includes the upland remediation area, is generally flat, with no unique topographic, geologic, or physical features. Following remediation, the excavations would be backfilled to original grade with clean fill and compacted according to engineering standards (see Section A.4.8, Backfilling and Site Restoration, above). Therefore, following construction, there would be no change in the topography or a unique physical feature and this impact would be *less than significant*.

Impact C-GE: The project, in combination with other past, present, and reasonably foreseeable future projects, would not result in a considerable contribution to cumulative impacts related to geologic hazards. (Less than Significant)

The entire Bay Area is in a seismically active region with a high risk of seismic hazards and a wide variety of geologic conditions. Nevertheless, the geographic scope of potential geology and soils impacts is restricted to the project site and immediate vicinity because related risks are relatively localized or even site-specific.

As discussed above, the project would result in less-than-significant impacts from substantial erosion/loss of topsoil, unstable geologic units, and changes in topography (Impacts GE-2, GE-3, and GE-4).

There are several cumulative projects listed in Table 3 that would be constructed near the project site. The Vista Grande Drainage Basin Improvement Project (Project 2) includes construction of a stormwater conveyance system and treatment wetlands along John Muir Drive, near the project site. The proposed update to the SNRAMP (Project 1) would include restoring some areas around Lake Merced. The Golden Gate National Recreation Area General Management Plan (Project 4) includes some habitat restoration and improvement activities, as well as some facility relocation. However, these actions would be conducted to the west of Lake Merced in Fort Funston and on Ocean Beach and would not be in the immediate vicinity of the project. Development projects listed in Table 3 include the Parkmerced Project (Project 7), actions under the San Francisco State University Campus Master Plan (Project 8), 2800 Sloat Boulevard (Project 9), and 800 Brotherhood Way (Project 11). All four projects would occur over a mile away from the project site, separated by Lake Merced. However, the project would not result in significant cumulative impacts relative to unstable geologic units or changes in topography in combination with any of the projects listed in Table 3. This is because, similar to the project, the effects of each project would be restricted to its immediate vicinity. Therefore, there would be no significant cumulative impacts from unstable geologic units and changes in topography from the construction of the cumulative projects identified *(no impact)*.

Relative to soil erosion, the project could potentially increase erosion in the vicinity of Lake Merced, as discussed in Impact GE-2. Implementation of actions under the proposed update to the SNRAMP (Project 1), and the Vista Grande Drainage Basin Improvement Project (Project 2) could also increase the potential for soil erosion in the vicinity of Lake Merced. Substantial erosion and loss of topsoil affecting water quality in Lake Merced would be a significant cumulative impact. When considered in combination with the other projects in the cumulative scenario, the project's incremental contribution to water quality impacts would not be cumulatively considerable because the SFPUC would implement erosion control measures during construction, in accordance with the Construction General Stormwater Permit, to minimize the potential for off-site movement of excavated soils. Further, the project includes hydroseeding the disturbed areas following construction (see Section A.4.8, Backfilling and Site Restoration). Because the potentially cumulative projects listed in Table 3 would be subject to these same requirements, cumulative impacts from erosion would be *less than significant*.

E.15 Hydrology and Water Quality

Topics:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Not Applicable*
15. HYDROLOGY AND WATER QUALITY—Would the project:					
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion of siltation on- or off-site?	☐	☐	☒	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	☐	☐	☒	☐	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map?	☐	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒	☐

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
j) Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒	☐

Lake Merced is incised into the Colma Formation, which constitutes the shallowest aquifer in the Westside Groundwater Basin where the project is located. However, the project would not require any groundwater dewatering or the use of groundwater for any purposes. As a result, it would not have any impact regarding groundwater depletion. In addition, the project would not include construction of any new impervious surfaces or other features that would restrict groundwater recharge. Therefore, there would be no impact related to Topic E.15(b).

Once excavation has been completed and sampling confirms that the cleanup criteria have been met, the excavations would be backfilled with clean fill, which would be compacted to engineering standards. The disturbed area would be hydroseeded to encourage revegetation, and the excavation area would be returned to its original grade, as discussed in Section A, Project Description. Further, some of the existing impervious surfaces would be replaced with compacted base that would be pervious. Therefore, the project would not increase stormwater runoff from the site and would not introduce a new source of stormwater pollutants; thus, there would be no impact related to Topic E.15(e).

The project does not include the construction of housing or any other structures that could obstruct flood flows. It is not in a Special Flood Hazard Area identified on San Francisco's Interim Floodplain Maps.[180] Therefore, Topics E.15(g) and E.15(h) are not applicable.

The project is not in a potential reservoir failure inundation area[181] or near any dams or levees. Therefore, there would be no impact related to Topic E.15(i).

Impact HY-1: The project would not violate water quality standards or otherwise substantially degrade water quality. (Less than Significant)

Construction-Related Stormwater Discharges

During project construction, water quality could be affected by erosion from grading and earthmoving operations or a release of fuels or other chemicals used during construction. Grading and earthmoving

180 City and County of San Francisco, 2008. San Francisco Interim Floodplain Map, West, Final Draft. July 2008.
181 San Francisco Planning Department, 2012. Community Safety, an Element of the General Plan of the City and County of San Francisco. October 2012.

would expose soil and could result in erosion and excess sediments carried in stormwater runoff to Lake Merced. Stormwater runoff from temporary onsite use and storage of vehicles, fuels, wastes, and building materials could also carry pollutants to Lake Merced if these materials were improperly handled.

The project would disturb more than one acre of land, and is located in an area adjacent to Lake Merced, served by a separate storm sewer system. Therefore, stormwater discharges from construction would be subject to the State Water Resources Control Board's (SWRCB) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ (Construction General Stormwater Permit). Construction activities subject to this permit include ground disturbances such as clearing, grading, and excavating, as well as soil stockpiling. Under the Construction General Stormwater Permit, construction projects are characterized by the level of risk to water quality. This is determined using a combination of the sediment risk of the project and the receiving water quality risk. Projects can be characterized as Level 1, Level 2, or Level 3, and the minimum Best Management Practices (BMPs) and monitoring that must be implemented during construction are based on the risk level. The BMPs are designed to prevent pollutants from coming in contact with stormwater and to keep all products of erosion and stormwater pollutants from moving offsite into receiving waters. They are specified in an SWPPP that must be prepared by a Qualified SWPPP Developer (QSD) and submitted to the San Francisco RWQCB before construction begins.

Sediment risk is determined based on the expected intensity of rainfall during the construction period, soil erodibility, and slope of the construction site. Therefore, the sediment risk for the project would depend on when it is implemented; it would have a higher sediment risk if implemented during the rainy season. Receiving water risk is based on whether the project drains to a sediment-sensitive water body, which is a water body that appears on the most recent 303(d) list of water bodies as impaired for sediment,[182] that has a USEPA-approved total maximum daily load implementation plan for sediment,[183] or that has the beneficial uses of cold freshwater habitat, fish migration, and fish spawning.

Lake Merced is listed as an impaired water body for dissolved oxygen and pH but not for sediment.[184] In addition, the San Francisco Bay Basin Plan identifies beneficial uses of Lake Merced as body-contact recreation (e.g., swimming, wading, and fishing), noncontact recreation (e.g., rowing), warm freshwater

182 An impaired water body is one that does not meet water quality standards or does not support its identified beneficial uses.

183 A total maximum daily load (TMDL) is the amount of a pollutant that a water body can receive and still meet water quality standards. A TMDL implementation plan describes how the water quality of an impaired water body will be restored and how water quality standards will be achieved.

184 State Water Resources Control Board, 2010. 2010 Integrated Report (Clean Water Act Section 303[d]) List/305(b) Report. http://www.swrcb.ca.gov/northcoast/water_issues/programs/tmdls/303d/#current. Accessed November 15, 2013.

habitat, cold freshwater habitat, fish spawning, and wildlife habitat.[185] Therefore, Lake Merced would not be considered a sediment-sensitive water body, because it is not listed as impaired for sediment and it does not have all three beneficial uses of cold freshwater habitat, fish migration, and fish spawning. Based on this, the project would have a Level 2 risk if it were implemented during a rainy period, when the sediment risk could be medium or high, and a Level 1 risk if it were implemented when the sediment risk would be low.

For construction activities characterized as Level 1, the Construction General Stormwater Permit specifies minimum BMPs to be implemented that address good housekeeping practices (including those for managing hazardous materials used during construction, non-stormwater management, erosion and sediment control, and run-on and runoff control.

A qualified professional must inspect the required BMPs weekly when there is no rain and daily during a qualifying rainstorm. For construction activities characterized as Level 2, the minimum requirements identified for Level 1 apply, as well as some more stringent requirements. For instance, erosion controls must be implemented in conjunction with sediment controls in active construction areas, and linear sediment controls must be used along slopes. In addition, a QSD must prepare rain event action plan for Level 2 construction activities. This plan would identify the designated site stormwater manager, the provider of erosion and sediment controls, and the stormwater sampling agent, as well as the trades active at the site during all construction phases. The plan would include suggested actions for each construction phase.

In addition, samples of stormwater discharges must be collected daily during qualifying rain events and analyzed for pH and turbidity, at a minimum. If the analytical results exceed the pH numeric action level of 6.5 to 8.5 or the turbidity numeric action level of 250 nephelometric turbidity units, the results must be reported to the SWRCB. The project sponsor would be required to implement corrective actions to ensure that the pH and turbidity remain within acceptable limits. Corrective actions could include making adjustments to BMPs that were deficient, implementing new BMPs, or potentially halting work until the rain is over.

Implementation of the requirements of the General Construction Stormwater Permit would ensure that construction activities under the project would not result in substantial amounts of erosion or sedimentation in Lake Merced, and that hazardous materials used during construction would be managed in accordance with good housekeeping practices to prevent a release. Therefore, water quality

[185] San Francisco Bay Regional Water Quality Control Board, 2011. *San Francisco Bay Basin (Region 2) Water Quality Control Plan* (Basin Plan) www.swrcb.ca.gov/rwqcb2/water_issues/programs/planningtmdls/basinplan/web/docs/BP_all_chapters.pdf, June 29, 2013. Accessed November 6, 2013

impacts from violating water quality standards or degrading water quality due to discharge of construction-related stormwater runoff would be *less than significant*.

Wastewater Discharges

As discussed in Section A, Project Description, soil treatment methods, such as soil washing or chemical stabilization, could be used. These methods could produce wastewater containing chemical constituents from the treated soil that could degrade water quality if discharged to Lake Merced. However, this water would be discharged to the CCSF's sewer system, in accordance with Article 4.1 of the San Francisco Public Works Code, as supplemented by Order No. 158170. Article 4.1 requires a permit from the SFPUC, which would contain appropriate standards to regulate the quantity and quality of discharges and could require the installation of meters to measure the volume of discharge. Although the wastewater could contain chemicals from the treated soil as well as sediment and suspended solids, the water would be treated as necessary to meet permit requirements before discharge. In past remediation efforts tracked by the USEPA, the water used for soil washing was not a RCRA hazardous waste and could be disposed of at a local wastewater treatment plant.[186] Because the wastewater produced during soil treatment would be discharged in accordance with regulatory requirements, impacts related to violating water quality standards or degrading water quality due to wastewater discharges would be *less than significant*.

Impact HY-2: The project would not alter the existing drainage pattern of the area in a manner that would result in substantial erosion, siltation, or flooding onsite or offsite. (Less than Significant)

The project includes extensive excavation to remove soils affected by previous skeet and trap shooting. However, once excavation has been completed and sampling confirms that the cleanup criteria have been met, the excavations would be backfilled with clean fill that would be compacted to engineering standards. The disturbed area would be hydroseeded to encourage revegetation, and the excavation area would be returned to its original grade. Therefore, the project would not alter drainage patterns in a way that would result in adverse onsite or offsite effects, such as flooding, erosion, or siltation. Therefore, this impact would be *less than significant*.

Impact HY-3: The project would not expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow. (Less than Significant)

Tsunamis (seismic sea waves) are long period waves typically caused by underwater seismic disturbances, volcanic eruptions, or submerged landslides. A tsunami, which travels at speeds up to 700 miles per hour, is typically only 1 to 3 feet high in open ocean water, but it may increase in height to

[186] USEPA, *Best Management Practices for Lead at Outdoor Shooting Ranges*, June 2005, p. III-15. http://www2.epa.gov/sites/production/files/documents/epa_bmp.pdf.

up to 90 feet as it reaches coastal areas and cause large amounts of damage.[187] The project is not in a tsunami hazard zone, identified in the Community Safety Element of the San Francisco General Plan.[188]

A seiche is caused by oscillation of the surface of an enclosed body of water, such as Lake Merced, during an earthquake. CCSF has not mapped areas of potential inundation by seiche; however, even if Lake Merced were to experience a seiche, the project does not include the construction of any new structures, nor would it introduce any new visitors to the project site who could be adversely affected. Also, there are no nearby slopes that could result in mudflows in the project vicinity. Therefore, impacts from exposure of people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow would be *less than significant*.

Impact C-HY: The project, in combination with past, present, and reasonably foreseeable future projects in the site vicinity, would not result in a considerable contribution to cumulative impacts on hydrology and water quality. (Less than Significant)

The project site is next to Lake Merced, and the potential water quality effects of the project would be restricted to the lake. Therefore, the geographic scope of potential cumulative water quality effects is restricted to the Lake Merced vicinity.

The proposed project would have less-than-significant water quality impacts related to violation of water quality standards, alteration of existing drainage patterns, and risk of inundation by seiche. As discussed under Impact HY-1, the project would excavate and backfill soil next to Lake Merced, which could result in increased erosion and, in turn, affect water quality in Lake Merced. There are several potentially cumulative projects listed in Table 3 that would be constructed in the vicinity of Lake Merced, and could also contribute to potential water quality impacts. The Vista Grande Drainage Basin Improvement Project (Project 2) includes construction of a stormwater conveyance structure and treatment wetlands along John Muir Drive, near the project site. Actions under the proposed update to the SNRAMP (Project 1) would also include restoring some areas around Lake Merced, and the San Francisco Groundwater Supply Project would construct a well facility at the Lake Merced Pump Station. However, as discussed in Impact HY-1, the project would implement the requirements of the Construction General Stormwater Permit, which would ensure that adverse erosional effects do not occur. Therefore, because the potentially cumulative projects listed in Table 3 would be subject to these same requirements, no significant cumulative impacts from erosion would be result from the construction of the proposed project, in combination with the other cumulative projects (*less than significant)*.

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[187] URS Corporation, 2008. City and County of San Francisco Hazard Mitigation Plan, December 2008.
[188] San Francisco Planning Department, 2012. Community Safety, an Element of the General Plan of the City and County of San Francisco. October 2012.

The projects proposed in the vicinity of Lake Merced could result in potentially significant cumulative impacts related to alteration of drainage patterns (Impact HY-2) or inundation by a seiche (Impact HY-3). However, the soil remediation project would not contribute to either of these cumulative impacts because it would not alter drainage patterns of the project site and would not include the construction of any new structures, nor would it introduce new visitors to the site who could be adversely affected by a seiche (*less than significant*).

E.16 Hazards and Hazardous Materials

Topics:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Not Applicable*
16. HAZARDS AND HAZARDOUS MATERIALS—Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐	☐
h) Expose people or structures to a significant risk of loss, injury or death involving fires?	☐	☐	☐	☒	☐

The project site is not located within ¼-mile of an existing or proposed school. While the project site is approximately 1/3-mile southeast of the CCSF's Police Pistol Range Heliport, it does not include the construction of any new structures, nor would it introduce new residents or workers to the project site, which would result in a safety hazard for people residing or working in the project area. The nearest public airport to the project site is San Francisco International Airport, approximately nine miles to the southeast, and the project is not within the airport's land use plan area, therefore Topics E.16(c), E.16(e), and E.16(f) are not applicable.

Impact HZ-1: Implementation of the project would not create a significant hazard through routine transport, use, or disposal of hazardous materials. (Less than Significant)

Hazardous materials that would be used during construction include fuels, lubricants, and solvents needed for the fueling and maintenance of construction equipment that would be used in site remediation. Storage and use of hazardous materials at the construction site and staging areas could result in the accidental release of small quantities of hazardous materials, which could degrade soil and groundwater quality and/or surface water quality in Lake Merced. However, as discussed in Section E.15, Hydrology and Water Quality (Impact HY-1), project construction would be subject to the Construction General Stormwater Permit issued by the State Water Resources Control Board. The SWPPP prepared in accordance with this permit would include at least the minimum BMPs specified in the Construction General Stormwater Permit for managing hazardous materials. These measures include the following: maintaining an inventory of all hazardous materials stored onsite; storing chemicals in water-tight containers with appropriate secondary containment, or within a completely enclosed storage shed; implementing procedures that effectively address hazardous spills; developing a spill response plan; and, maintaining personnel, materials, and equipment for spill cleanup at the construction site. Regarding vehicle maintenance, the minimum requirements of the Construction General Stormwater Permit address preventing oil, grease, and fuel from leaking into the ground or surface water; placing all equipment needing fueling or maintenance in a designated area with appropriate BMPs; and cleaning leaks immediately and disposing of the leaked materials properly. With implementation of these SWPPP requirements in accordance with the Construction General Stormwater Permit, impacts from the use and storage of hazardous materials during construction would be *less than significant*.

The project would not include the construction of any new facilities that would use hazardous materials, therefore there would be no impact related to the routine transport, use, or disposal of hazardous materials during operation.

Impact HZ-2: The project site is identified on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Remediation activities would require the handling of contaminated soil, potentially exposing workers and the public to hazardous materials, or resulting in a release into the environment during construction. (Less than Significant)

The project site is included on the RWQCB's list of cleanup program sites.[189] As discussed in Section A, Project Description, the project would remediate upland soil contamination at the site. This would be in accordance with Site Cleanup Requirements Order No. R2-2013-0023, which the RWQCB issued to the PRGC and the SFPUC. The planned remediation includes cleaning up contaminated soil to health-based cleanup levels that are protective of the health of visitors, site workers, and neighbors under current and future uses. This would improve the condition of the site with respect to soil contamination.

Further, during proposed remediation, the contractor would be required to implement a health and safety plan, in accordance with Federal and State Occupational Safety and Health Administration regulations for hazardous waste operations. These regulations specify the health and safety plan elements and worker training requirements that must be addressed. Use of the engineering controls, work practices, and personal protective equipment specified in the health and safety plan would ensure that exposure to hazardous material would not result in a harmful health effect. These practices would reduce the potential for an accidental release of contaminated soil during construction.

Excavated soil would be temporarily stored in stockpiles on liner materials, protected from stormwater run-on and runoff, and covered to prevent windblown dust. The waste piles would be regularly inspected. A low point would be provided to collect any stormwater within the bermed area, and accumulated water would be pumped into a portable storage tank. The contained water would be tested and treated if needed to meet requirements for discharge, as discussed in Section E.15, Hydrology and Water Quality. The soil would be loaded onto trucks for offsite disposal, depending on the classification of the soil as a RCRA hazardous, non-RCRA California hazardous, or nonhazardous waste. Alternatively, soil that would otherwise be classified as a hazardous waste could be treated onsite using soil washing or chemical stabilization to improve the waste classification.

Soil treatment would be conducted in accordance with the Requirements for Units and Facilities Deemed to Have a Permit by Rule (Title 22, California Code of Regulations, Division 4.5, Chapter 45, Article 1). These regulatory conditions require a waste analysis plan for the treatment operation, a written inspection schedule, training requirements for system operators, a contingency plan, and a closure plan for the facility. Offsite migration of windblown dust would be minimized by implementing dust control

[189] State Water Resources Control Board, Geotracker. Pacific Rod and Gun Club (T10000005188). http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T10000005188. Accessed November 22, 2013.

measures, in accordance with the CCSF Dust Control Ordinance (described in Section E.7, Air Quality, Impact AQ-1). The appropriate measures would be specified in the required dust control plan, which must be approved by the San Francisco Department of Public Health.

Soil remediation would be performed in accordance with all regulatory requirements for handling, on-site treatment (if conducted), transport, and disposal of contaminated soil which would reduce the potential for accidental releases and harmful exposures to hazardous materials in site soils. For these reasons, impacts related to location on a site identified on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and creating a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment would be *less than significant*.

Impact HZ-3: Implementation of the project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (Less than Significant)

As discussed in Section E.5, Transportation and Circulation (Impact TR-4), construction staging areas and construction activities would occur onsite, with no expected roadway or lane closures. Further, access to the site via the existing driveway would be maintained. The project would not include any design features that would temporarily or permanently restrict emergency vehicles from accessing the site. While the increase in slow-moving trucks could slightly delay access to the project site and nearby land uses and cross streets for both general and emergency vehicles, this effect would be temporary and small in relation to the existing traffic volumes. The SFPUC would also develop and implement a construction management plan that would maintain emergency access at all times during construction. Therefore, impacts related to impairing or interfering with the implementation of an adopted emergency response plan or emergency evacuation plan would be *less than significant*.

Impact HZ-4: The project would not expose people or structures to a significant risk of loss, injury, or death involving fires. (No Impact)

The project site is not in a high fire danger area[190] and would not include the construction of any new facilities or implementation of any activities that would increase the risk of fire. Therefore, the project would not expose people or structures to a significant risk of loss, injury, or death involving fires, and there would be *no impact*.

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[190] Cal Fire, 2007. Draft Fire Hazard Severity Zones in LRA, San Francisco County. October 5, 2007.

Impact C-HZ: The project, in combination with past, present, and reasonably foreseeable future projects in the site vicinity, would not result in a considerable contribution to cumulative impacts related to hazardous materials. (Less than Significant)

Impacts could result from the project's use of hazardous materials during construction and performance of site remediation within areas of known contaminated soil. These impacts would be primarily restricted to the project area and immediate vicinity; therefore, the geographic scope for cumulative impacts from hazards includes the project area and immediate vicinity.

As discussed in Impact HZ-1, the project would use common construction-related hazardous materials. There are several potentially cumulative projects listed in Table 3 that would be constructed in the vicinity of Lake Merced that would also use hazardous materials during construction. The Vista Grande Drainage Basin Improvement Project (Project 2) includes construction of a stormwater conveyance structure and a treatment wetland along John Muir Drive, near the project site. The proposed update to the SNRAMP (Project 1) would also include restoration of some areas around Lake Merced. However, as discussed in Impact HZ-1, the remediation contractor would be required to implement a SWPPP under the Construction General Stormwater Permit issued by the SWRCB. The SWPPP would include at least the minimum BMPs specified in the Construction General Stormwater Permit for the management of hazardous materials. Because the potentially cumulative projects listed in Table 3 would be subject to these same requirements, potential cumulative impacts from use of hazardous materials during construction would be *less than significant*.

As discussed in Impact HZ-2, the project includes the remediation of contaminated soil at the project site. There are no other documented sites of soil contamination in the vicinity of the project. Due to the site-specific nature of contamination, there would be no significant cumulative impact related to location on a known hazardous materials site to which both the project and other cumulative projects in the vicinity would contribute (*no impact*). As discussed in Impact HZ-3, the project would result in an increase in slow-moving trucks, which could temporarily delay access to the site and nearby land uses and cross streets. The Vista Grande Drainage Basin Improvement Project (Project 2) would also increase construction traffic along John Muir Drive. This also could contribute to construction traffic that could impede access to the project site and nearby land uses and cross streets. Because the construction schedule of the Vista Grande project could overlap with the proposed project in early 2016, cumulative impacts related to implementation of an adopted emergency response plan or emergency evacuation plan would be potentially significant. However, the proposed project includes development of a construction management plan. As discussed in Section E.5, Transportation and Circulation (Impact TR-3), the SFPUC would coordinate with the appropriate jurisdictional agencies through the Street Construction Coordination Center of the SFDPW and the Transportation Advisory Staff Committee. With implementation of this plan and the specified coordination, the project would not have a cumulatively considerable contribution to cumulative impacts related to implementation of an adopted emergency response plan or emergency evacuation plan (*less than significant*).

E.17 Mineral and Energy Resources

Topics:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Not Applicable*
17. MINERAL AND ENERGY RESOURCES—Would the project:					
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☐	☒
c) Encourage activities which result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner?	☐	☐	☒	☐	☐

The project would not result in the loss of availability of a known mineral resource because the project site is in an area mapped by the California Geological Survey as MRZ-1. This means that the area does not contain significant mineral deposits.[191] In addition, applicable land use plans do not identify the project site as a source of locally important mineral resources. San Francisco General Plan policies, which govern the Lake Merced area, are included in the Western Shoreline Area Plan, wherein no mineral recovery sites are discussed. For these reasons, Topics 17(a) and 17(b) are *not applicable* to the project.

Impact ME-1: The project would not result in substantial adverse effects related to the use of large amounts of fuel, water, or energy or the use of these resources in a wasteful manner. (Less than Significant)

The project would result in the short-term use of fuel, water, and electricity during construction. There are no long-term operations and maintenance activities associated with the project, thus, there would be no long-term use of fuel or water.

Site remediation would require the use of fuels (primarily gasoline and diesel fuel) for construction and soil hauling during the 57-week construction period. The excavated soil from the project site would be

[191] California Geological Survey, 1996. Generalized Mineral Land Classification Map of the South San Francisco Bay Production-Consumption Region.

hauled either to the Clean Harbors Class I Buttonwillow Facility in Buttonwillow, California, or the Recology Hay Road Class II/III Landfill near Vacaville. An estimated maximum of 2,325 truck trips to either of these facilities would be required to haul the excavated soil. Backfill material is estimated to require an equal number of truck trips from import fill sources to be identified by the SFPUC. Truck trips for hauling excavated soil and backfill material would use fuel; however, the SFPUC would evaluate potential soil treatment technologies, such as soil washing and chemical stabilization, to reduce the quantity of project soil requiring disposal at the more distant Class I hazardous waste landfill in Buttonwillow.

As required by the CCSF Clean Construction Ordinance, all diesel fuel vehicles would use B20 biodiesel; construction equipment would meet the USEPA Tier 2 standards or best available control technologies (see Section E.8, Greenhouse Gases). Compliance with construction air quality regulations would reduce excessive idling and other inefficient site operations that could waste fuel and add to potential air quality impacts from increased fuel use. Water use would be limited to dust control and potentially soil washing, which would not involve large quantities of water. Minor amounts of electricity could be used for power tools and equipment. Therefore, the project would not result in substantial adverse effects related to the use of large amounts of water or fuel in a wasteful manner, and the impact would be *less than significant*.

Impact C-ME: The proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in significant adverse cumulative mineral and energy impacts. (Less than Significant)

As stated above, the project site is not designated as a statewide-, regionally-, or locally-important mineral resource recovery site, and the project would result in no impact on mineral resources. Therefore, there would be no cumulative impact on mineral resources.

The geographic scope for potential cumulative impacts to energy resources impacts encompasses the SFPUC water and power supply system. SFPUC supplies the city and county of San Francisco as well as others in the region with water and power. Similar to proposed project, other projects within the vicinity or the region would require the use of fuel, water, or energy. These cumulative would also be required to comply with the California Green Building Standards Code, at a minimum, and would also be subject to local green building ordinances, which must be as stringent as the state requirements and are often more stringent. Because these building codes encourage sustainable construction practices related to planning and design, energy efficiency, and water efficiency and conservation, energy consumption would be expected to be reduced compared to conditions without such regulations. Therefore, potential cumulative impacts related to wasteful use of energy resources would be *less than significant*.

E.18 Agriculture and Forest Sources

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
18. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. **—Would the project**					
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)) or timberland (as defined by Public Resources Code Section 4526)?	☐	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or forest land to non-forest use?	☐	☐	☐	☐	☒

The project area is mapped as urban and built-up land on maps prepared under the Farmland Mapping and Monitoring Program[192]; therefore, the project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to nonagricultural use.

The project site is zoned for public use, which permits various types of residential districts and dwellings (from single-family houses to high-density mixed districts) and residential-commercial districts of medium-high density. The project site is not zoned specifically for agricultural use and is not currently used for agriculture (although Neighborhood Agricultural use is technically allowed under current zoning). San Francisco County is not subject to the Williamson Act, meaning that there are no lands where potential uses are restricted to either agriculture or other agriculture-compatible open-space uses.[193]

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192 California Department of Conservation, 2013. *Important Farmland Maps*. July 2013.

193 California Department of Conservation, 2010. The California Land Conservation (Williamson) Act 2010 Status Report. November 2010.

The project site is not zoned as forest land or timberland; it is shown as urban land on land cover and use maps compiled by the California Department of Forestry and Fire Protection.[194] Therefore, the project would not result in the loss of forest land or conversion of forest land to non-forest use. No other changes brought by implementation of the project would convert farmland to nonagricultural use or forest land to nonforest use. For these reasons, agricultural and forest resource Topics 18(a) through 18(e) are *not applicable* to the project.

E.19 Mandatory Findings and Significance

Topics:	*Potentially Significant Impact*	*Less than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*	*Not Applicable*
19. MANDATORY FINDINGS OF SIGNIFICANCE—Would the project:					
a) Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐	☐
b) Have impacts that would be individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☒	☐	☐	☐
c) Have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐	☐

Impact MF-1: The project could degrade the quality of the environment, reduce the habitat of, or otherwise adversely affect a rare or endangered plant or animal species. (Less than Significant with Mitigation)

Overall, the project would improve the quality of the environment by remediating soils impacted by hazardous materials and reducing the potential for contaminants to leach into Lake Merced. The discussion in Section E, evaluation of environmental effects, identifies potentially significant impacts of the project on the environment related to cultural resources, noise, air quality, and biological resources. However, mitigation measures have been provided to address these potentially significant project-

194 California Department of Forestry and Fire Protection, 2006. *Land Cover: Multi-Source Data Compiled in 2006*.

specific impacts. Implementation of the mitigation measures would reduce the impacts to a less-than-significant level.

> As discussed in Impact BI-1 in Section E.13, Biological Resources, project impacts on special-status plant species (San Francisco Bay spineflower, blue coast gilia, San Francisco wallflower, and dune tansy) would be less than significant with implementation of **Mitigation Measures M-BI-1a, Protocol Surveys for Special-Status Plants in 2014** and **M-BI-1b, Relocation of Special-Status Plants**. Project impacts on special-status reptiles (Western pond turtle) would be less than significant with implementation of **Mitigation Measure M-BI-1c, Avoidance and Minimization for Pacific Pond Turtle,** and project impacts on nesting birds and special-status bats would be less than significant with implementation of **Mitigation Measure M-BI-1d, Nesting Bird Protection Measures,** and **M-BI-1e, Avoidance and Minimization Measures for Special-Status Bats**. In addition, wetland habitats would be protected and restored with implementation of **Mitigation Measures M-BI-2, Restoration of Coastal Scrub, Riparian Scrub, and Wetlands** and **M-BI-3, Wetland Protection**.

In summary, impacts related to reducing the number or restricting the range of a rare or endangered plant or animal would be *less than significant with mitigation*.

Impact MF-2: The project could eliminate important examples of the major periods of California history or prehistory. (Less than Significant with Mitigation)

As discussed in Impacts CP-1, CP-2, CP-3, and CP-4, project construction could result in potential impacts on historic architectural resources, unknown paleontological resources, archaeological resources, and human remains. These impacts would be less than significant with implementation of the following mitigation measures: **Mitigation Measures M-CP-1a, Record and Reconstruct the Semi-Circular Station Paths at Skeet Fields 4-7; M-CP-1b, Record, Protect, and Return (or Replace in-Kind) the High/Low Houses and Wood Fences at Skeet Fields 4-7; M-CP-1c, Protect the Four Contributory Buildings During Construction; M-NO-2a, Preconstruction Surveys and Repair; M-NO-2b, Construction Equipment Restrictions Near Buildings; M-CP-2, Accidental Discovery of Archaeological Resources; M-CP-3 Unanticipated Discovery Measures for Paleontological Resources; and M-CP-4, Unanticipated Discovery Measures for Human Remains, Associated or Unassociated Funerary Objects**. Therefore, impacts related to elimination of important examples of California history or prehistory are *less than significant with mitigation*.

Impact MF-3: The project could have impacts that would be individually limited but cumulatively considerable. (Less than Significant with Mitigation)

Section 15130 of the CEQA guidelines requires a reasonable analysis of the significant cumulative impacts to which a project could contribute. Cumulative impact refers to "two or more individual effects that, when considered together, are considerable or able to compound or increase other environmental impacts." The individual effects may be changes resulting from a single project or an increase in the number of environmental impacts. The cumulative impact is the change in the environment that results when the incremental impact of the project is added to closely related past, present, or reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects that take place over time (CEQA Guidelines Section 15355 [a][b]).

For the purposes of this initial study, the geographic context for the project's cumulative impact assessment is generally the Lake Merced area, although an expanded geographic context was considered for some topics. Recently approved and reasonably foreseeable projects and planning efforts in the vicinity of the project site are presented in Table 3.

The analysis in this initial study determined that the project would have no impact on, or is not applicable to, wind and shadow, public services, and agriculture. Therefore, the project would not contribute to cumulative impacts related to these issue areas.

Potential cumulative impacts for the remaining environmental issue areas are assessed in the relevant subsections of Section E, Evaluation of Environmental Effects. However, for the reasons described in Sections E.1 through E.18, with implementation of mitigation measures to address potentially significant project-specific impacts, the project's contribution to all cumulative impacts on the environment would not be cumulatively considerable (*less than significant with mitigation*).

Impact MF-4: The project could have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly. (Less than Significant with Mitigation)

The discussion in Section E, Evaluation of Environmental Effects, identifies potentially significant impacts related to aesthetics, cultural resources, transportation and circulation, noise, air quality, and biological resources. Of these, impacts related to transportation, noise and air quality could adversely affect humans. Mitigation measures have been provided in this initial study to reduce these potentially significant project-specific impacts to a less-than-significant level. No project-specific significant impacts were identified for the following environmental issue areas: land use, population and housing, greenhouse gases, wind and shadow, recreation, utilities and service systems, public services, geology and soils, hydrology and water quality, hazards and hazardous materials, mineral and energy resources, and agricultural and forest resources. Therefore, with implementation of the mitigation measures specified in Sections E.1 through E.18, the project would not result in substantial adverse effects, direct or indirect, on human beings (*less than significant with mitigation*).

F. MITIGATION MEASURES

The following mitigation measures have been adopted by the project sponsor and are necessary to avoid potential significant impacts of the project.

Mitigation Measure M-AE-3: Screening Vegetation.

The SFPUC shall identify the location and spacing of new plantings that would, at maturity, screen views of the eastern portion of the site. New plants shall include native species indigenous to the San Francisco Peninsula and/or shrubs and trees typical of the surrounding area. Plantings (by way of species type, size, and location) shall ensure that direct views of the site east of the entrance are substantially obstructed from any location within a ten-year period. The SFPUC shall monitor and photograph screening vegetation annually after completion of remediation activities. If it is determined that success standards are not being met, SFPUC shall take immediate action to re-plant screening vegetation to ensure compliance by the tenth-year period.

Mitigation Measure M-CP-1a: Record and Reconstruct the Semi-Circular Station Paths at Skeet Fields 4 – 7.

The SFPUC or its contractor shall implement the following to comply with the Secretary of Interior's Standards for Rehabilitation:

- Prior to commencement of site remediation, the SFPUC shall record the original size, configuration, and locations of the semi-circular station paths at skeet fields 4 – 7 through the use of digital photography and mapping. The original dimensions and locations of the station paths shall be mapped on a site plan to aid the later reconstruction of these features.
- Following site remediation, the SFPUC shall reconstruct the semi-circular station paths which define skeet fields 4 – 7 in the same size, configuration, and location as the original station paths, including the level terrace and linear arrangement of the fields. As the existing concrete materials post-date the period of significance and are not character-defining, concrete may be substituted for other compatible materials (e.g. crushed rock, gravel, or wood boardwalks outlining the path configurations).

Mitigation Measure M-CP-1b: Record, Protect, and Return (or Replace in-Kind) the High/Low Houses and Wood Fences at Skeet Fields 4 – 7.

The SFPUC or its contractor shall implement the following measures to comply with the Standards for Rehabilitation:

- Prior to commencement of site remediation, the SFPUC shall record and document the existing structural condition and location of the wood frame high/low houses at skeet fields 4 – 7 (total of 8 structures) and the wood fences which separate these fields (total of 4 fences). This shall be accomplished through; 1) digital photography of all such features, 2) mapping their original locations and configuration on a site plan, and 3) numbering and cataloging each structure. These features shall be carefully relocated to a secure, onsite or off site location to avoid damage. If stored onsite, they may be relocated to alternate safety zones as remediation progresses. The most appropriate temporary relocation sites shall be determined by the SFPUC prior to commencement of work.

- During site remediation activities, the SFPUC shall protect these features from accidental damage during earth moving by storing these elements within a locked, chain-link fence enclosure and posting "Keep Out" or "No Trespassing" signs.
- Following site remediation, the SFPUC shall return these features to their original positions at the reconstructed skeet fields 4 – 7. Based on the pre-construction recording and depending on their structural condition, any damaged components should be repaired in keeping with the Secretary of Interior's Standards for Rehabilitation. If they were previously damaged beyond repair, they are in poor structural condition, or if it is infeasible to return them to their original location due to their condition or other factors, they may be replaced in-kind in a similar size, design, location, and materials as existing, in keeping with the Standards.

Mitigation Measure M-CP-1c: Protect the Four Contributory Buildings During Construction.

The SFPUC or its contractor shall implement the following measures to comply with the Standards for Rehabilitation:

- During site remediation activities, the four contributory buildings (Clubhouse, Caretaker's House, Rifle Range Building, and the Shell House), shall be adequately protected from accidental damage due to construction activities and vandalism. These structures shall be surrounded by protective fencing and shall be secured from entry by boarding up all windows and doors, and posting "Keep Out" or "No Trespassing" signs on each building. Following site remediation, these buildings shall be returned to their original appearance by removing all temporary construction fencing, window and door protection, and signage.

Mitigation Measure M-CP-2: Accidental Discovery of Archeological Resources.

The following measures shall be implemented should construction activities result in the accidental discovery of a cultural resource:

> The following mitigation measure is required to avoid any potential adverse effect from the proposed project on accidentally discovered buried or submerged historical resources as defined in CEQA Guidelines Section 15064.5(a)(c). The project sponsor shall distribute the Planning Department archeological resource "ALERT" sheet to the project prime contractor; to any project subcontractor (including demolition, excavation, grading, foundation, etc. firms); or utilities firm involved in soils disturbing activities within the project site. Prior to any soils disturbing activities being undertaken each contractor is responsible for ensuring that the "ALERT" sheet is circulated to all field personnel including, machine operators, field crew, supervisory personnel, etc. The project sponsor shall provide the Environmental Review Officer (ERO) with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) to the ERO confirming that all field personnel have received copies of the Alert Sheet.
>
> Should any indication of an archeological resource be encountered during any soils disturbing activity of the project, the project Head Foreman and/or project sponsor shall immediately notify the ERO and shall immediately suspend any soils disturbing activities in the vicinity of the discovery until the ERO has determined what additional measures should be undertaken.
>
> If the ERO determines that an archeological resource may be present within the project site, the project sponsor shall retain the services of a qualified archeological consultant, based on

standards developed by the Planning Department archeologist. The archeological consultant shall advise the ERO as to whether the discovery is an archeological resource, retains sufficient integrity, and is of potential scientific/historical/cultural significance. If an archeological resource is present, the archeological consultant shall identify and evaluate the archeological resource. The archeological consultant shall make a recommendation as to what action, if any, is warranted. Based on this information, the ERO may require, if warranted, specific additional measures to be implemented by the project sponsor.

Measures might include: preservation in situ of the archeological resource; an archeological monitoring program; or an archeological testing program. If an archeological monitoring program or archeological testing program is required, it shall be consistent with the Environmental Planning (EP) division guidelines for such programs. The ERO may also require that the project sponsor immediately implement a site security program if the archeological resource is at risk from vandalism, looting, or other damaging actions.

The project archeological consultant shall submit a Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archeological resource and describing the archeological and historical research methods employed in the archeological monitoring/data recovery program(s) undertaken. Information that may put at risk any archeological resource shall be provided in a separate removable insert within the final report.

Copies of the Draft FARR shall be sent to the ERO for review and approval. Once approved by the ERO, copies of the FARR shall be distributed as follows: California Archeological Site Survey Northwest Information Center (NWIC) shall receive one (1) copy and the ERO shall receive a copy of the transmittal of the FARR to the NWIC. The Environmental Planning division of the Planning Department shall receive one bound copy, one unbound copy and one unlocked, searchable PDF copy on CD three copies of the FARR along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources. In instances of high public interest or interpretive value, the ERO may require a different final report content, format, and distribution than that presented above.

Mitigation Measure M-CP-3: Accidental Discovery of Paleontological Resources.

The following measures shall be implemented should construction result in the accidental discovery of paleontological resources:

To reduce the potential for the proposed project to result in a significant impact on paleontological resources, the SFPUC shall arrange for a paleontological training by a qualified paleontologist regarding the potential for such resources to exist in the project site and how to identify such resources. The training could consist of a recorded presentation that could be reused for new personnel. The training shall also include a review of penalties for looting and disturbance of these resources. An alert sheet shall be prepared by the qualified paleontologist and shall include the following:

1. A discussion of the potential to encounter paleontological resources;
2. Instructions for reporting observed looting of a paleontological resource; and instructions that if a paleontological deposit is encountered within a project area, all soil-disturbing

activities in the vicinity of the deposit shall cease within 50 feet and the ERO shall be notified immediately; and,

3. Who to contact in the event of an unanticipated discovery.

If potential fossils are discovered by construction crews, all earthwork or other types of ground disturbance within 50 feet of the find shall stop immediately until the qualified professional paleontologist can assess the nature and importance of the find. Based on the scientific value or uniqueness of the find, the paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the fossil. The paleontologist may also propose modifications to the stop-work radius based on the nature of the find, site geology, and the activities occurring on the site. If treatment and salvage is required, recommendations shall be consistent with SVP 1995 guidelines and currently accepted scientific practice, and shall be subject to review and approval by the ERO or designee. If required, treatment for fossil remains may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection, and may also include preparation of a report for publication describing the finds. The SFPUC shall be responsible for ensuring that treatment is implemented and reported to the San Francisco Planning Department. If no report is required, the SFPUC shall nonetheless ensure that information on the nature, location, and depth of all finds is readily available to the scientific community through university curation or other appropriate means.

Mitigation Measure M-CP-4: Accidental Discovery of Human Remains.

The following measures shall be implemented should construction activities result in the accidental discovery of human remains and associated cultural materials:

The treatment of human remains and of associated or unassociated funerary objects discovered during any soil-disturbing activities shall comply with applicable state laws. This shall include immediate notification of the coroner of the county within which the project is located and, in the event of the coroner's determination that the human remains are Native American, notification of the California Native American Heritage Commission, which shall appoint a most likely descendant (MLD) (PRC Section 5097.98). The archeological consultant, SFPUC, and MLD shall make all reasonable efforts to develop an agreement for the treatment, with appropriate dignity, of human remains and associated or unassociated funerary objects (CEQA Guidelines Section 15064.5[d]). The agreement should take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. The PRC allows 24 hours to reach agreement on these matters. If the MLD and the other parties do not agree on the reburial method, the SFPUC shall follow Section 5097.98(b) of the PRC, which states that "the landowner or his or her authorized representative shall reinter the human remains and items associated with Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance."

Mitigation Measure M-TR-1: Implement Flag Control to Maintain Bicycle and Pedestrian Access.

The SFPUC and its contractor shall require flaggers to be present onsite during daily construction activities. Flaggers shall be located at the entry and exit locations of the project site and shall coordinate the movement of construction vehicles in and out of the project site. In addition, flaggers shall maintain access to on- and off-street bicycle and pedestrian facilities and the use of flaggers shall reduce any intermittent blockages to such facilities, and eliminate any long-term blockages to such facilities.

Mitigation Measure M-NO-2a: Preconstruction Surveys and Repair.

SFPUC shall conduct a preconstruction survey of onsite buildings to document preconstruction building conditions. Following construction, the buildings shall be re-inspected. Any new cracks or other changes in structures shall be compared to preconstruction conditions and a determination made as to whether project activities could have caused such damage. In the event that the project is demonstrated to have caused the damage, SFPUC shall be responsible for having the damage repaired to the pre-existing condition.

Mitigation Measure M-NO-2b: Construction Equipment Restrictions Near Buildings.

To minimize vibration effects, no earthmoving equipment shall be used within 1.5 feet of the Clubhouse, Caretaker's House, Rifle Range Building and Shell House; only small earthmoving equipment shall be used between 1.5 feet and 15 feet of the these buildings. No vibratory equipment shall be used within 8 feet of the Clubhouse, Caretaker's House, Rifle Range Building, and Shell House and only small vibratory equipment (including compactors) shall be used between 8 feet and 26 feet of these buildings. Small earthmoving equipment and vibrators shall be used within 10 feet and 17 feet, respectively, from other buildings.

Mitigation Measure M-AQ-1: Construction Emissions Minimization.

A. ***Construction Emissions Minimization Plan.*** The project sponsor shall reduce construction-related NOx emissions by a minimum of 40 percent as compared to that estimated in this environmental analysis. Prior to issuance of a construction permit, the project sponsor shall submit a Construction Emissions Minimization Plan (Plan) to the Environmental Review Officer (ERO) for review and approval by an Environmental Planning Air Quality Specialist. The requirements of this plan may be met by demonstrating project compliance with the following:

    1. Limit truck idling time to two minutes. Legible and visible signs shall be posted in multiple languages (English, Spanish, Chinese) in designated queuing areas and at the construction site to remind operators of the two minute idling limit;

    2. The project sponsor shall require that construction operators properly maintain and tune equipment in accordance with manufacturer specifications; and

    3. All on-road haul trucks (i.e., trucks used for disposal of excavated material and delivery of clean fill) shall be year 2010 or newer.

    Should the project sponsor choose to comply with this mitigation measure through any means other than the requirements listed above, the Plan shall demonstrate an equivalent reduction in NOx emissions (40%). The project sponsor shall submit to the ERO, prior to construction, all applicable construction equipment information required to ensure that the project sponsor has fully complied with this mitigation measure.

B. Reporting. Monthly reports shall be submitted to the ERO indicating the construction phase and off-road equipment information used during each phase including the information required in A, above.

Within six months of the completion of construction activities, the project sponsor shall submit to the ERO a final report summarizing construction activities. The final report shall indicate the start and end dates and duration of each construction phase.

C. ***Certification Statement and On-site Requirements.*** Prior to the commencement of construction activities, the project sponsor must certify (1) compliance with the Plan, and (2) all applicable requirements of the Plan have been incorporated into contract specifications.

Mitigation Measure MI-BI-1a: Protocol Surveys for Special-Status Plants.

The SFPUC shall retain a qualified botanist to conduct preconstruction CDFG protocol-level[195] surveys for special-status plants (in particular San Francisco Bay spineflower, blue coast gilia, San Francisco wallflower, and dune tansy) on the project site and adjacent suitable habitat during the blooming period for these species. Surveys shall occur in the spring for San Francisco Bay spineflower (April – July), blue coast gilia (April – July), and San Francisco wallflower (March – June), and in the late summer for dune tansy (July – October).

Survey results shall be mapped and documented in a technical memorandum and provided to the Planning Department. If no special-status plants are identified during surveys, then these plants shall be assumed to be absent from the project site. If special-status plants are found during surveys, suitable habitat shall be mapped for avoidance in order to account for seasonal growth variability from year to year, when plants may not bloom but remain present in the seed bank. Suitable habitat areas shall be demarcated by a qualified botanist with flagging or orange fencing with signs that read "Environmentally Sensitive Area – Keep Out." These markings shall be installed before construction begins and continuously maintained throughout construction.

Mitigation Measure M-BI-1b: Relocation of Special-Status Plants.

If special-status plants are located within the remediation site and cannot be avoided during remediation, then a plan shall be developed in coordination with CDFW to relocate them to suitable habitat within the Lake Merced shoreline area. This can be done either through salvage and transplanting or by collection and propagation of seeds or other vegetative material. Any plant relocation would be done under the supervision of a qualified botanist.

Mitigation Measure M-BI-1c: Worker Environmental Awareness Program Training.

A project-specific Worker Environmental Awareness Program (WEAP) training shall be developed and implemented by a qualified biologist for the project and attended by all construction personnel prior to beginning work onsite. The WEAP training shall generally include but not be limited to the following:

- Applicable State and federal laws, environmental regulations, project permit conditions, and penalties for non-compliance;
- Special-status plant and wildlife species with potential to occur on or in the vicinity of the project site, avoidance measures, and a protocol for encountering such species including a communication chain;

[195] CDFG, 2009. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. Biogeographic Data Branch, Sacramento. Data dated November 24, 2009.

- Preconstruction surveys and biological monitoring requirements associated with each phase of work;
- Known sensitive resource areas in the project vicinity which are to be avoided and/or protected (e.g. wetlands) as well as approved project work areas; and
- Best Management Practices (BMPs) and their location on the project site for erosion control and/or species exclusion.

Mitigation Measure M-B1d: Avoidance and Minimization Measures for Western Pond Turtle.

During construction at the project site, the SFPUC shall ensure a biological monitor is present during installation of exclusion fencing and initial vegetation clearing and grading. Also, the following measures shall be implemented:

- Within one week before construction commences, a qualified biologist shall supervise the installation of exclusion fencing along the boundaries of the work area, as the biologist deems necessary to prevent western pond turtles from entering the work area. The construction contractor shall install CDFW-approved species exclusion fencing, with a minimum height of 3 feet above ground surface and with an additional 4–6 inches of fence material buried such that species cannot crawl under the fence. Fencing installed along the north border (lakeside border) of the site can be multipurpose silt fencing (see Mitigation Measure M-BI-3, Wetland Protection, below) and exclusion fencing.

- A qualified biologist shall survey the project area within 48 hours before the onset of initial ground-disturbing activities and shall be present during initial vegetation clearing and ground-disturbing activities. The biological monitor shall monitor the exclusion fencing weekly to confirm proper maintenance and inspect for turtles. If western pond turtles are found, the SFPUC shall halt construction in the vicinity that poses a threat to the individual as determined by the qualified biologist. If possible, the individual shall be allowed to move out of the project area of its own volition (e.g., if it is near the exclusion fence that can be temporarily removed to let it pass). The qualified biologist shall relocate turtles to the nearest suitable habitat should they not leave the work area of their own accord. Construction shall resume after the individual is out of harm's way. If western pond turtles occur repeatedly onsite after the exclusion fencing has been installed, a qualified biologist shall initiate preconstruction sweeps of the project site for this species prior to start of construction on a daily basis and thereinafter throughout the duration of the project.

- During project activities, excavations deeper than 6 inches shall have a sloping escape ramp of earth or a wooden plank installed at a 3:1 rise; openings, such as pipes, where western pond turtles might seek refuge shall be covered when not in use; and all trash that may attract predators or hide western pond turtles shall be properly contained each day, removed from the worksite, and disposed of regularly. Following site remediation, the construction contractor shall remove all trash and construction debris from the work areas.

Mitigation Measure M-BI-1e: Nesting Bird Protection Measures

Nesting birds and their nests shall be protected during construction by use of the following:

- Removal of trees, scrub vegetation and structures shall occur outside the bird nesting season (February 1 to August 30), to the extent feasible.

- If removal of trees, scrub vegetation or structures during bird nesting season cannot be fully avoided, a qualified wildlife biologist shall conduct preconstruction nesting surveys within seven days prior to the start of such activities or after any construction breaks of 14 days or more. Surveys shall be performed for the project site and suitable habitat within 250 feet of the project site in order to locate any active passerine (perching bird) nests and within 500 feet of the project site to locate any active raptor (birds of prey) nests or double-crested cormorant or heron rookeries.

- If active nests are located during the preconstruction bird nesting survey, the wildlife biologist shall evaluate if the schedule of construction activities could affect the active nests and the following measures shall be implemented based on their determination:

  - If construction is not likely to affect the active nest, it may proceed without restriction; however, a biologist shall regularly monitor the nest to confirm there is no adverse effect and may revise their determination at any time during the nesting season In this case, the following measure would apply.

  - If construction may affect the active nest, the biologist shall establish a no disturbance buffer. Typically, these buffer distances are between 25 feet and 250 feet for passerines and between 300 feet and 500 feet for raptors. These distances may be adjusted depending on the level of surrounding ambient activity (e.g. if the project area is adjacent to a road or active trail) and if an obstruction, such as a building, is within line-of-sight between the nest and construction. For bird species that are federally and/or state-listed sensitive species (i.e., fully protected, endangered, threatened, species of special concern), an SFPUC representative, supported by the wildlife biologist, shall consult with the USFWS and/or CDFW regarding modifications to nest buffers, prohibiting construction within the buffer, modifying construction, and removing or relocating active nests that are found on the site.

- Removing inactive passerine nests may occur at any time. Inactive raptor nests shall not be removed unless approved by the USFWS and/or CDFW.

- Removing or relocating active nests shall be coordinated by the SFPUC representative with the USFWS and/or CDFW, as appropriate, given the nests that are found on site.

- Any birds that begin nesting within the project area and survey buffers amid construction activities are assumed to be habituated to construction-related or similar noise and disturbance levels and no work exclusion zones shall be established around active nests in these cases.

Mitigation Measure M-BI-1f: Avoidance and Minimization Measures for Special-Status Bats.

In coordination with the SFPUC, a preconstruction survey for special-status bats shall be conducted by a qualified biologist in advance of tree and structure removal within the project site to characterize potential bat habitat and identify active roost sites. Should potential roosting habitat or active bat roosts be found in trees and/or structures to be removed under the project, the following measures shall be implemented:

- Removal of trees and structures shall occur when bats are active, approximately between the periods of March 1 to April 15 and August 15 to October 15; outside of bat maternity roosting season (approximately April 15 – August 31) and outside of months of winter torpor (approximately October 15 – February 28), to the extent feasible.

- If removal of trees and structures during the periods when bats are active is not feasible and active bat roosts being used for maternity or hibernation purposes are found on or in the immediate vicinity of the project site where tree and structure removal is planned, a no-disturbance buffer of 100 feet shall be established around these roost sites until they are determined to be no longer active by the qualified biologist.

- The qualified biologist shall be present during tree and structure removal if active bat roosts are present. Trees and structures with active roosts shall be removed only when no rain is occurring or is forecast to occur for 3 days and when daytime temperatures are at least 50°F.

- Removal of trees with active or potentially active roost sites shall follow a two-step removal process:

    1. On the first day of tree removal and under supervision of the qualified biologist, branches and limbs not containing cavities or fissures in which bats could roost, shall be cut only using chainsaws.

    2. On the following day and under the supervision of the qualified biologist, the remainder of the tree may be removed, either using chainsaws or other equipment (e.g. excavator or backhoe).

- Removal of structures containing or suspected to contain active bat roosts shall be dismantled under the supervision of the qualified biologist in the evening and after bats have emerged from the roost to forage. Structures shall be partially dismantled to significantly change the roost conditions, causing bats to abandon and not return to the roost.

- Bat roosts that begin during remediation are presumed to be unaffected, and no buffer would be necessary.

Mitigation Measure M-BI-2: Restoration of Coastal Scrub, Riparian Scrub, and Wetlands

The habitat functions and services of all coastal scrub habitat, arroyo willow riparian scrub habitat, and freshwater emergent wetlands affected during construction shall be restored in-place to pre-project conditions. A Riparian and Wetland Restoration and Mitigation Monitoring Plan shall be prepared for the affected areas, subject to approval by the appropriate regulatory agencies, and shall generally include, but not be limited, to the following:

- A final grading plan for the affected coastal scrub habitat, riparian scrub habitat, and wetlands which would restore the topography of the affected habitat areas to pre-project conditions;

- A planting plan, composed of native coastal scrub, riparian scrub, and freshwater emergent wetland plant species, consistent with the coastal scrub, riparian habitat and wetlands of Lake Merced;

- A weed control plan to prevent the spread of invasive non-native plant species on the project site;

- Performance criteria for the revegetated areas that establish success thresholds over a specific amount of time (typically five years) as determined by the regulatory agencies with jurisdiction over the affected areas;

- A monitoring and reporting program under which progress of the revegetated areas shall be tracked to ensure survival of the mitigation plantings. The program shall document overall health and vigor of mitigation plantings throughout the monitoring period and provide recommendations for adaptive management as needed to ensure the site is successful, according to the established performance criteria. An annual report documenting monitoring results and providing recommendations for improvement throughout the year shall be provided to the regulatory agencies; and

- A best management practices element describing erosion control measures to be installed around the affected areas following mitigation planting in order to avoid sediment runoff into the adjacent waters of Lake Merced.

Mitigation Measure M-BI-3: Wetland Protection.

At the project site, wetland protection measures shall be applied to protect state and federal jurisdictional wetlands. These measures shall include the following:

- A protective barrier (such as silt fencing) shall be erected around the adjacent wetland feature to isolate it from remediation activities;
- Signage shall be installed on the fencing to identify sensitive habitat areas and restrict construction activities;
- No equipment mobilization, grading, clearing, or storage of equipment or machinery, or similar activity shall occur at the project site until a representative of SFPUC has inspected and approved the wetland protection fencing; and
- The SFPUC shall ensure that the temporary fencing is continuously maintained until all remediation is completed.

A fencing material meeting the requirements of both water quality protection and wildlife exclusion may be used.

G. PUBLIC NOTICE AND COMMENT

G.1 Comments Received in Response to Notification of Project Receiving Environmental Review

A "Notification of Project Receiving Environmental Review" was mailed on February 21, 2014 to property owners and residents of property within 300 feet of the project site, responsible and trustee agencies, and interested parties. The following comments in response to the notification were received:

- San Francisco Recreation and Park Department – Expressed interest in staying informed about the project, in particular with respect to erosion control measures
- Golden Gate Audubon Conservation Committee – Requested receiving notifications regarding environmental review. The scope of environmental review should include the following: timing and extent of remediation; containment and disposal of spoils; and measures to address impacts on Lake Merced's wildlife.
- Mr. Dick Morten – Suggested that project-specific mitigation measures address potential impacts on nesting birds, dust, noise, odors, traffic, and public safety.

G.2 Comments Received in Response to Preliminary Mitigated Negative Declaration and Initial Study

On June 25, 2014, the Planning department circulated a Notice of Availability of and Intent to Adopt a Mitigated Negative Declaration. Below are summaries of the written letters received from local organizations and individuals. No comments were received from state or local agencies, property owners or residents within 300 feet of the project site. Where applicable, the summaries below also identify where changes have been incorporated into this document in response to these comments.

- **Dick Allen, Dolphin Club** – inquired whether the removal of 81 or more trees would alter wind patterns and velocity on South Lake, and expressed the concern that any wind velocity increase would negatively affect rowing activities on Lake Merced.
- **Dick Morten** – stated that tree removals should only occur if necessary and after habitat and wildlife impacts have been evaluated; that the IS/MND should not indicate that the PRGC has any right to future site use, and that site structures should not be considered historic resources because they may not have been constructed according to code.
- **Golden Gate Audubon Society** – provided comments and recommendations on various topics below:
    - ***Fugitive Dust*** – expressed concern about the potential for fugitive dust and contaminated material to enter Lake Merced and waterbirds, aquatic wildlife, and recreationists; proposed the establishment of monitoring stations and an emergency dust plan. In response to this comment, additional discussion was added to Section E.13, Biological Resources, on pages 135-136.
    - ***Bird Data*** – proposed using bird data available for the entire area surrounding Lake Merced in analysis of impacts to birds. Provided additional information about the Fox Sparrow, Western Kingbird, Black Phoebe, Townsend's Warbler, Yellow Warbler, Tricolored Blackbird, and Great Blue Heron. In response to these comments, Section E.13, Biological Resources, was revised on pages 124 and 134.
    - ***Nesting birds*** – suggested that work exclusion zones be placed around nests built during project activities and that monitoring and surveys be conducted throughout the birding season.
    - ***Tree Removal*** – questioned the 10-year screening requirement for tree replacement described in Mitigation Measure M-AE-3 and proposes that tree health, as evaluated by a qualified professional, be used as success criteria. In addition, provided recommendations for tree replacement species and numbers.
    - ***Future Site Use*** – indicated that cleanup for unrestricted future use appears contradictory to the project description which states that PRGC activities would be suspended during construction and Mitigation Measures M-CP-1a and M-CP-1b that would restore skeet fields 4-7. Suggested those measures be postponed until after future site use is determined by the SFPUC. Also suggested that a groundwater recharge plan be prepared for the site.
    - ***Coyotes*** – suggested measures to reduce project impacts on potential coyote dens.
- **Friends of the Gulls** – Requested that Friends of the Gulls be added to distribution list for project updates.

- **Frank H. (Bert) Swan, Ph.D.** – expressed the opinion that the AMEC health risk assessment assumptions are unrealistically conservative and warrant additional evaluation, such as biological testing of on-site and off-site gophers to determine the bioavailability of PAHs; asserted that vehicle emissions and runoff from pavement along John Muir Boulevard contribute to PAHs and lead in soil; claimed that the project requires an EIR and a cost benefit analysis of alternative remediation methods; and, indicated the proposed remediation is not based on adequate data and cost considerations.

- **Jeanine Mahl** – Supported Dr. Swan's position, questioned whether existing toxicity levels really pose a health risk, and argued for further soil and animal testing and environmental impact studies.

- **Peter Griffith** – Requested that an EIR/cost benefit analysis be completed prior to project implementation.

H. DETERMINATION

On the basis of this Initial Study:

☐ I find that the project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the project, no further environmental

DATE June 25, 2014

Sarah B. Jones
Environmental Review Officer
for
John Rahaim
Director of Planning

I

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APPENDIX A

Pacific Rod and Gun Club, San Francisco, CA

Cultural Landscape Evaluation Report

Pacific Rod and Gun Club
San Francisco, CA

Cultural Landscape Evaluation Report

Submitted
to
ESA
550 Kearny Street, Suite 800
San Francisco, CA 94108

Prepared
by
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May 2014

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APPENDIX

I. INTRODUCTION

The purpose of this report to provide an evaluation of the Pacific Rod and Gun Club (PRGC) site under federal, state, and local criteria for its potential significance as a cultural landscape. Cultural landscapes are defined as geographic areas shaped by human activity; they can result from a conscious design or plan, or evolve as a byproduct or result of people's activities; and they may be associated with a historic event, activity, or person or exhibit other cultural or aesthetic values (NPS, 1996:4). Of the four general types of cultural landscapes (historic sites, designed landscapes, vernacular landscapes, and ethnographic landscapes), the PRGC can best be described as a vernacular landscape—that is, one that has evolved through use by the people whose activities or occupancy shaped it and one in which function plays a significant role (NPS, 1996:4-5).

This report includes the following sections:

- A description of the field, research, and evaluation methodology.
- A summary of the regulatory framework.
- Historic contexts within which to evaluate the significance of the PRGC site including the development of recreation around Lake Merced, the role of the Works Progress Administration (WPA) in the development of recreation in San Francisco, the history of skeet and trap shooting in San Francisco, and the recreational shooting activities at the PRGC within the context of sport hunting and its association with the early 20th century wildlife conservation movement.
- A history of the PRGC and the evolution of the site in relationship to this history.
- A description and analysis of the existing conditions of the cultural landscape features at the PRGC site.
- An evaluation of the significance and integrity of the PRGC as a cultural landscape under the federal, state, and local criteria.
- A bibliography of references used to prepare this memo.
- An appendix with historical images, a map showing the location of key features (Figure 1), a map showing the location of existing conditions photographs (Figure 2), and photographs of the existing conditions.

II. METHODS

A. Personnel

This Cultural Landscape Evaluation Report was prepared by Denise Bradley. Ms. Bradley (Master of Landscape Architecture, Louisiana State University) has 20 years of experience as a landscape historian in California and meets the Secretary of the Interior's Historic Preservation Professional Qualifications for Historical Landscape Architecture and History. ESA Architectural Historian Brad Brewster provided written descriptions of the buildings and an assessment of their integrity.

B. Field Methods

Denise Bradley conducted an intensive survey of the cultural landscape at the PRGC on September 19, 2013. Field notes and photographs were taken to aid in the preparation of the description and the evaluation of the site. An additional site visit was conducted with ESA Architectural Historian Brad Brewster on October 2, 2013 to meet with Patrick Gilligan (PRGC President) to obtain information about the names and functions of the site features within the context of skeet and trap shooting.

C. Research Methods

The focus of the research for this Cultural Landscape Evaluation Report was a review of primary and secondary sources for information that would aid in the evaluation of the potential significance and integrity of the PRGC as a cultural landscape.

Repositories that were consulted included the San Francisco Public Utilities Commission (SFPUC) collections (Archives, Photographs Archives, and Record Management), the San Francisco Public Library, the University of California, Berkeley's Earth Sciences Map Room, the Pacific Aerial Surveys collection, the National Skeet Shooting Association-National Sporting Clays Association (NSSA-NCSA) Museum archives, the PRGC collection of historical photographs, memorabilia, scrap books, newspaper clippings, club histories, etc., and a variety of online repositories.

Key references that were consulted for the historic context on the development of recreation around Lake Merced included the *Lake Merced Watershed Report* (SFPUC, 2011); SFPUC annual reports from the 1930s, a report on WPA accomplishments in San Francisco (Healy, 1939), a publication, *I Am OMI*, on the surrounding neighborhoods prepared by the Western Neighborhoods Project (LaBounty, 2003), and the historic context on Lake Merced in the *San Francisco Groundwater Supply Project, City and County of San Francisco, Final Historic Resources Evaluation Report* (ESA, 2011).

Key references that were consulted on the role of the WPA in the development of recreation in San Francisco during the Depression included two summary reports on WPA accomplishments in the city (Mooser, 1938; Healy, 1939), SFPUC annual reports from the era, *San Francisco Parks and Playgrounds, 1839 to 1990: The History of A Public Good in One North American City* (Delehanty, 1993), *The Public Landscape of the New Deal* (Cutler, 1985), and the article "How the WPA Transformed San Francisco" from *Landscape Architecture Magazine* (Martensen, 1979).

Key references that were consulted on the history of skeet and trap shooting included information from the PRGC collection including histories prepared by two of its past presidents (Springer, 1949; Alkalay, n.d.), several target shooting instructional books that provided background information on the development of the sports (Nichols, 1939 [1947 edition]; Croft, 1990; Migdalski, 1997; Sapp, 2009, and information on the websites of national and state organizations and Bay Area target shooting clubs and facilities (listed in the bibliography). Phone interviews were conducted with the director of the NSSA (Mayes, 2014) on the development of the sport nationally and with a board member of the California Skeet Shooting Association (CSSA) on the development of the sport in California and in the Bay Area (Burke, 2014). Information on the histories of other Bay Area target shooting organizations that appeared to have the potential to have facilities as old as those at the PRGC was gathered through personal communication with the clubs or club members (Boyle, 2014; Burke, 2014; Frenkel, 2014; Gobbell, 2014; Marazzani, 2014; Sargentini, 2014; Stockton Rod and Gun Club, 2014), site visits (to the Martinez and Richmond clubs), a review of information on the organizations' websites, and a review aerial photographs (on Google Earth and in the Pacific Aerial Surveys collection) to help to determine how long the clubs had been at their current sites and how these facilities had changed over time. Information on the nonextant Fort Mason Rod and Gun Club, which was located at Fort Funston, was gathered through personal communication (Martini, 2014; Williford, 2014) and a review of aerial photographs in the Pacific Aerial Surveys collection.

Key references for the development of the historic context that sets the recreational shooting activities at the PRGC within the context of sport hunting and its association with the wildlife conservation movement of the late 19th and early 20th centuries included *America Learns to Play: A History of Popular Recreation, 1607-1940 (*Dulles, 1965), *Hunting and the American Imagination* (Herman, 2001), *American Sportsmen and the Origins of Conservation* (Rieger, 2001), "Hunting Democracy" in *Montana: The Magazine of Western History* (Herman, 2005), *Mortal Stakes: Hunters and Hunting in Contemporary America* (Dizard, 2003), a history of game regulations on the California Department of Fish and Game website (DFG, 1999), and several early twentieth century accounts of conservation as it relates to hunting (Grinnell et al., 1918; Burnham, 1928; McAllister, 1930).

Key references on the history of the PRGC and the evolution of the site included written recollections and histories from members (Springer, 1949; Alkalay, n.d.; Kahn, 1987) and other information from the club's archive (including historical photographs, memorabilia, typewritten manuscripts, newspaper clippings, and past issues of the club's newsletter, the *Pacific Breeze)*, aerial photographs (Cartwright Aerial Surveys, 1965; GoogleEarth, 1938 and 2000-2013; Pacific Aerial Surveys, 1935-2001), and personal communication (Gilligan, 2013; Boyle, 2014).[1] Information on the three PRGC members who are in the CSSA Hall of Fame was obtained through personal communication (Boyle, 2014). Information on the 1939 National Skeet Championship at the PRGC was gathered from the club histories cited above, a review of San Francisco newspapers, and information in articles in *Skeet Shooting News*, the official publication of the NSSA, and the book *Trap and Skeet Shooting* by Jimmy Robinson, who was considered the preeminent sportswriter on trap and skeet shooting during that era.

[1] Denise Bradley contacted PRGC President Patrick Gilligan to ask his assistance in arranging an oral interview with long-time member Ray Brooks, Jr. on the history of the club (Gilligan, 2014); however, at the time of the submission of this report, no additional information had been received on if and when that interview could be arranged.

A full list of the references is provided in the bibliography.

D. Evaluation Methodology

The PRGC was evaluated under the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR), for its potential historical significance as a cultural landscape. Additionally, the NRHP Criteria guide the evaluation of significance for San Francisco's list of locally designated City Landmarks and Historic Districts which are designated under San Francisco Planning Code Article 10 (SFPD, 2013:6).

The California Office of Historic Preservation's *Technical Assistance Series #6: California Register and National Register: A Comparison (for purposes of determining eligibility for the California Register)* and *Technical Assistance Series #7: How to Nominate a Resource to the California Register of Historical Resources (Revised 2001)* were consulted in relation to the CRHR criteria. The CRHR does not provide specific guidance for describing cultural landscapes. However, the CRHR was consciously designed on the model of the NRHP (the two programs are extremely similar, although there areas in which these programs differ), and guidance provided in NRHP and National Park Service (NPS) publications were consulted in preparing the evaluation for the PRGC. *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* provided general guidance on the NRHP, and *National Register Bulletin 30: How to Evaluate and Document Rural Historic Landscapes* provided additional guidance on the evaluation of cultural landscape features. *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques* was consulted on the procedures related to research and documentation for cultural landscapes; and *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* was consulted related to definitions of cultural landscapes and cultural landscape features.

As described in NRHP bulletins and NPS publications on cultural landscapes, both the processes that helped to form the landscape and its individual components are critical to the understanding of a cultural landscape. The key processes to the formation of a cultural landscape include land uses and activities, patterns of spatial organization, responses to the natural environment, and cultural traditions. The individual components of a cultural landscape include groupings of features within a larger landscape, circulation-related features, the various types of boundary demarcations, vegetation features, buildings and structures, archaeological resources, and small-scale elements (NPS, 1999: 3-6). The description and evaluation of the PRGC site incorporates these cultural landscape characteristics and features.

III. REGULATORY CONTEXT

The evaluations of the built environment features within the Project footprint were conducted in compliance with the California Environmental Quality Act (CEQA). Provided below are the federal, state, and local regulatory context for the evaluation of historic resources, including cultural landscapes.

A. Federal Regulations

The National Historic Preservation Act (NHPA) of 1966, as amended, administers the NRHP, which sets forth evaluation criteria described in 36 CFR Part 60.4. The following criteria are designed to guide the states, federal agencies, and the Secretary of the Interior in evaluating potential entries for the NRHP. The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that:

A. Are associated with events that have made significant contribution to the broad patterns of our history; or

B. Are associated with the lives of persons significant in our past; or

C. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master or that possess high artistic values or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Have yielded, or may be likely to yield, information important in prehistory or history.

The question of integrity is another factor that must be addressed when determining the eligibility of a resource for listing in the NRHP. The Secretary of the Interior describes integrity as "the ability of a property to convey its significance." A property must retain certain intact physical features in order to convey its significance under one or more of the NRHP criteria. Integrity is judged on seven aspects; location, design, setting, workmanship, materials, feeling, and association.

If a particular resource meets one or more of these criteria and retains sufficient integrity to convey its historical significance, it is considered as an eligible "historic property" for listing in the NRHP. Additionally, unless exceptionally significant, a property must be at least 50 years old to be eligible for listing.

B. State Regulations

The State of California implements the NHPA of 1966, as amended, through its statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation (DPR), implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historical Resources Inventory. The SHPO is an appointed official who implements historic preservation programs within the state's jurisdictions.

California Register of Historical Resources

The CRHR is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (Public Resources Code [PRC] Section 5024.1[a]). The criteria for eligibility to the CRHR are based on NRHP criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the CRHR, including California properties formally determined eligible for or listed in the NRHP.

To be eligible for the CRHR a historical resource must be significant at the local, state, and/or federal level under one or more of the following criteria:

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

2. Is associated with the lives of persons important in our past;

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

4. Has yielded, or may be likely to yield, information important in prehistory or history (PRC Section 5024.1[c]).

For a resource to be eligible for the CRHR, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. A resource that does not retain sufficient integrity to meet the NRHP criteria may still be eligible for listing in the CRHR.

California Environmental Quality Act

CEQA, as codified in PRC Sections 21000 et seq., is the principal statute governing the environmental review of projects in the state involving discretionary actions by public agencies. CEQA requires lead agencies to determine if a proposed project would have a significant effect on important historical resources, including archaeological resources. CEQA Guidelines section 15064.5 [a] and [b] define a historical resource as: (1) a resource in the CRHR; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

C. Local Regulations of the San Francisco Planning Department

San Francisco Historic Preservation Commission and Planning Code Articles 10 and 11

Article 10 of the San Francisco Planning Code describes procedures regarding the preservation of sites and areas of special character or special historic, architectural, or aesthetic interest or value, such as officially designated city landmarks and buildings included within locally designated historic districts. Article 11 of the Planning Code designated six downtown conservation districts.

Created in 2008, the Historic Preservation Commission is a seven-member body that makes recommendations directly to the Board of Supervisors, bypassing the Planning Commission, on the designation of landmark buildings, historic districts, and significant buildings. The Historic Preservation Commission replaces and retains most of the responsibilities of the Landmarks Preservation Advisory Board (Landmarks Board). The Landmarks Board was a nine-member body, appointed by the mayor, which served as an advisory board to the Planning Commission and the Planning Department. The Landmarks Board was established in 1967 with the adoption of Article 10 of the Planning Code. The work of the Landmarks Board, the Planning Department, and the Planning Commission has resulted in an increase of public awareness about the need to protect the City and County of San Francisco's (CCSF's) architectural, historical, and cultural heritage.

The Historic Preservation Commission makes recommendations to the Board of Supervisors on building permit applications that involve construction, alteration, or demolition of landmark sites and resources located within historic districts. The Historic Preservation Commission may also review and comment on projects affecting historical resources that are subject to environmental review under the CEQA. The Historic Preservation Commission also approves Certificates of Appropriateness for Landmarks and properties within Article 10 Historic Districts.

IV. HISTORIC CONTEXTS

Historic contexts regarding (1) the development of recreation in San Francisco and at Lake Merced, (2) the role of the WPA in the development of recreation in San Francisco and at the PRGC site, (3) the recreational shooting activities at the PRGC within the context of sport hunting and its association with the wildlife conservation movement of the early 20th century, and (4) the history of trap and skeet in San Francisco and the Bay Area are provided below to provide a basis for evaluating the significance of the PRGC site as a cultural landscape.

A. Development of Recreation around Lake Merced

The first European contact with Lake Merced came during the Spanish expedition led by Don Fernando Rivera and Father Francisco Palou who came to the area in 1774 searching for sites to establish a mission as part of Spain's expansion into Alta California. They are believed to have camped just north of where present-day Lake Merced Boulevard intersects with the San Francisco-San Mateo County line. On his return in 1775, Father Palou named the lake *Laguna de Nuestra Senora de la Merced* or The Lake of Our Lady of Mercy; the name was subsequently shortened in local usage to Lake Merced. From 1776 to 1835, the land around the lake was part of the Mission San Francisco de Asis (Mission Dolores) holdings and was used for grazing the mission's livestock herd (SFPUC, 2011:99; ESA, 2011:38).

The control of the lands in San Francisco transferred to Mexico in 1821 following the founding of the Republic of Mexico, and in 1834, the government began the process of secularizing the California missions and granting large tracts of land to individuals. In 1835, Jose Antonio Galindo was granted 2,200 acres of land that included Lake Merced. Two years later Galindo sold the land to Don Francisco de Haro for 100 cattle and $25.00 in goods. De Haro, who was the first mayor of San Francisco, built a house at the southern end of the lake and lived here part-time until he died in 1849 (SFPUC, 2011:99; ESA, 2011:38). During this same period, settlers squatted around the northern end of the lake and developed farms (to improve the land as part of their claims under the Homestead Act). Their presence altered the land use around Lake Merced from livestock grazing to cropland; the farmers raised grains for hay, potatoes, onions, and miscellaneous vegetables. "The agricultural production continued, primarily to the north of Lake Merced, until approximately 1920 when development eclipsed the farmland as the predominant land use" (SFPUC, 2011:99).

During the latter half of the 19th century, San Franciscans considered Lake Merced as rural and remote. They would venture out on the weekends to go to the beach via Ocean House Road (today's Ocean Avenue), and it was a popular area to pick wildflowers or to go hunting. The relative isolation of the area also made it a favorite spot for a variety of other recreation including roadhouses (the Ingleside Inn, the Ocean House, the Oceanside House, the Trocadero Inn, and the Lake House, located on the north shore of Lake Merced), a number of boxing camps, shooting ranges, bars located along Ocean House Road, and racetracks (the Ocean Course Racetrack, located just north of Sloat Boulevard, and the Ingleside Racetrack, located east of Junipera Serra Boulevard) (LaBounty, 2003:4-6; SFPUC, 2011:100). Of these facilities, only the Trocadero Inn, located in the Sigmund Stern Recreational Grove, remains extant.

The Spring Valley Water Company (SVWC), incorporated in 1858, formed a monopoly over the city's water supply, and in 1868, the company bought the water rights to Lake Merced, one of the few sources of freshwater in the city, for $150,000. In 1877, the company began purchasing the land within the watershed around the lake. By the turn of the 20th century, the SVWC owned the area from the San Francisco-San Mateo County line to Sloat Boulevard and from Junipera Serra Boulevard to the ocean (approximately 2,000 acres). Following the devastating 1906 Earthquake and Fire, San Franciscans voted in 1908 to approve the construction of the Hetch Hetchy dam in the Sierra Nevada to gain public control of its water supply. Subsequently the company began to sell off its holdings around Lake Merced which opened the door for a new era of recreational land uses around the lake (ESA, 2011:38-39; SFPUC, 2011:30 and 100).

Three golf courses opened in the surrounding area between 1915 and 1925—the San Francisco Club southeast of the lake in 1915, the Olympic Club which purchased the financially troubled Lakeside Golf Course, west of lake, in 1918, and Harding Park situated between the North and South lakes in 1925. The PRGC leased the land for their new club site on the lake's western shoreline in 1934, only four years after the city had purchased the lake from SVWC in 1930. Around in 1931, the PRGC was involved with early efforts to stock the lake with black bass and later hosted the first "Carp Derby" on the lake in 1940. In 1938-1939, the SFPUC awarded a fishing concession to Tom Cusick who leased about 50 rows boats and constructed a boat house and clubhouse; the current boathouse was built in 1958 (SFPUC, 1934: 7; SFPUC, 1939:23; Healy, 1939:43; Springer, 1949:Parts Three and Six; SFPUC, 2013: 30-31).

The WPA constructed a boulevard around the lake in the late 1930s which greatly improved access to the lake and the various recreational opportunities there. John Muir Boulevard, as it was named, not only improved access to the lake but also provided "a landscaped boulevard of rare value for recreation and scenic beauty skirting the shores of Lake Merced" (Healy, 1939:43). This project altered the topography of the land within the road's alignment and next to the lake, and added equestrian paths, retaining walls (constructed of various materials including rock, rubble, and logs), rock gutters, rock steps and coping, sewer, sloping, and landscaping around the lake's perimeter (Healy, 1939:43).

Today, the lake is used for a variety of land and water based recreational pursuits including golfing at the three courses, recreational target shooting (at the PRGC), trail-based recreation, picnicking, camping at Camp Ida Smith (operated by the Girl Scouts), competitive boating (sculling and dragon boating), leisure boating, wind-surfing, and fishing (ESA, 2011:38-39; SFPUC, 2011:20-33 and 100-101).

B. Role of the WPA in Recreation Development in San Francisco

The site preparation work undertaken by the WPA at the PRGC as part of the preparations for the 1939 National Skeet Championships (discussed in more detail below) was one of many improvements to San Francisco's park and recreational facilities that were made possible by this federally-funded, Depression era, works program. The WPA was established on May 6, 1935 by Executive Order 7034, at the beginning of Franklin Roosevelt's "Second New Deal" (as his second term came to be known). An independent agency funded directly by Congress, the WPA assumed the dominant role in the federal government's work relief activities after its establishment. Through a central administration in Washington, D.C., and supported by various regional offices, state administrations, and district offices, the agency financed up to 80 percent of the cost of projects using local materials and local labor, thereby adding money to the local economy and providing extended employment to unskilled and skilled laborers (Cutler, 1985:7). As was the case in other cities, a major component of WPA work in San Francisco was directed at improving parks and recreational facilities, and "park and playground construction consumed more of their time than any other avocation with the single exception of road building" (Martensen, 1979:75).

WPA park-related projects in the San Francisco included work at Balboa, Bay View, Buena Vista, Golden Gate, Harding, Inspiration Point, McLaren, Mount Davidson, Sharps, Stern Grove, and Telegraph Hill parks. Major projects included the construction of Aquatic Park, the Marina seawall, Park Presidio through Golden Gate Park, and exhibits for the Zoological Gardens (Mooser, 1938). Recreation-related projects aimed to fulfill the slogan "Making Play & Sports Available to All Citizens" that accompanied photographs in *San Francisco Improved*, a summary report of WPA projects in San Francisco between 1935 and 1939 (Healy, 1939:n.p.) and resulted in new recreation centers, clubhouses (including the Model Yacht Clubhouse and Anglers' Lodge in Golden Gate Park and the clubhouses at the Lincoln Park and Harding golf courses), 16 new playgrounds, the refurbishing of 15 existing playgrounds, and the addition of restrooms (convenience stations) and basketball and tennis courts to playgrounds throughout the city. In total, over $15 million in WPA funding was spent on park and recreation projects from 1935 through 1939 (Mooser, 1938; Healy, 1939:35-38; Martensen, 1979:75; Delehanty, 1992:383; NPS, 2004).

The work undertaken by the WPA at the PRGC to prepare the site for the National Championships (in skeet) held there on August 8-12, 1939 was one of a variety of sports-related projects funded by the WPA. (Healy stated, in *San Francisco Improved,* that "[t]his project shows the variety of sports that are encouraged to promote the health and enjoyment of the people" [Healy, 1939:65]). The high visibility of the National Championships and the fact that it would take place in the summer of 1939 during the Golden Gate International Exposition (GGIE) may have been contributing factors to the funding for this project. Mindful of the thousands of people that would visit San Francisco and the publicity that would accompany the GGIE, William Mooser Jr. (San Francisco WPA Branch Manager) noted his progress report that "San Francisco, desirous of living up to its reputation of the 'city that knows how' is, therefore, planning projects and civic improvements with that deadline date [of the GGIE] constantly in mind" (Mooser, 1938:8).

Although, the National Championships were a high profile event for the city, the work done by the WPA at the site was crucial to the club's ability to host the national event. In his club history, long-time club member and past club president Joe Springer wrote: "The grading of the fields and the parking area were the big problems. This, we had the assurance from the city, would be done, and it was, but with many headaches, as it was a W.P.A. job and couldn't be rushed. The eight fields were erected, but the shooters began arriving before the last shovel full of dirt was finished on the parking area" (Springer, 1949:Part Five). According to the short summary in a 1939 report prepared by Clyde E. Healy (the city's coordinator for WPA projects), the WPA project "cleared the site and prepared it for skeet shooting" (Healy, 1939:65). The summary table in Healy's report showed that the federal government funded the labor ($1,404), and the city paid for the materials ($775).

C. Sport Shooting and its Association with the Wildlife Conservation Movement of the Late 19th and Early 20th Centuries

The loss of habitat and the decline of game species became highly visible during the last half of the 19th century and occurred within the context of a national preoccupation with the loss of the natural resources. In California, the period during and immediately following the Gold Rush brought about rapid development that resulted in readily visible changes to many of the state's natural resources. Hydraulic mining which clogged streams and rivers with great amounts of sediment, clear cutting of forests to provide for the increased demand for lumber and for firewood as a result of the massive immigration after the discovery of gold in 1849, and the reclamation of marshlands all visibly altered wildlife habitats. Game birds that once had been widely distributed throughout the state came to be "crowded into the few ponds and marshes that were not reclaimed" (Grinnell et al., 1918:10). Other practices, including the sale of game on the open market, the use of the automatic shotgun, dumping of waste oil into estuaries, and the destruction of upland game birds habitat due to grazing also contributed to this loss (Grinnell et al., 1918:9-16).

During the latter decades of the 19th century and early years of the 20th century, hunting increasingly came to be confined—not just in California but throughout the country—to a system of large private game preserves. Several examples, cited in Justin Herman's article "Hunting Democracy," included the control by private clubs of the marshlands of the Columbia and Williamette rivers in Washington and Oregon and "virtually all duck hunting grounds in the vicinities of Denver and Los Angeles" (Herman, 2005:26). M. Hall McAllister, in a 1930 article for the *California Fish and Game* journal, stated that the organization of duck clubs in northern California began when the "Southern Pacific Railroad built across the Suisun marsh in 1878-79" and "brought this wonderful sanctum of ducks and geese within a few hours of San Francisco and Oakland" (Hall, 1930:283); the entire 5,000 acre marsh was owned by The Chamberlain Estate and was leased to two market hunters (Hall, 1930:283). "In San Francisco three hunting clubs owned or leased a combined 116,000 acre of game preserves in 1904" (Herman, 2005:26). The membership in each of these early clubs was limited to a few wealthy individuals. For example the early clubs, organized in the 1880s and 1890s, mentioned in McAllister's article had only three to ten members (Hall, 1930:284). The costs associated with this type of club—the transportation by railroad or private boat to the club sites,[2] the upkeep of a clubhouse where the members stayed, the salary of a game keeper who managed the land and who patrolled the grounds to keep non-members out, and the maintenance of habitats (constructing levees, baiting the ponds, etc.)—were born by the affluent members (Grinnell et al., 1918:24). The rapid growth of sportsmen's clubs and associations during the latter decades of the 19th century was founded not only on camaraderie and a love of hunting (and fishing) but also upon a desire to provide a way to preserve and manage wildlife and their habitat which were increasingly viewed as endangered. National publications, such as the *American Sportsman*, *Field and Stream*, and *Forest and Stream*,

[2] McAllister noted that the Cordelia Shooting Club, organized with ten members in 1880, included a "contract with the well-known Captain Charles Chittenden to hire his yacht, the yawl *Lolita*, which afterward was superseded by the yacht *White Wings*, and later by a large and commodious house ark" (Hall, 1930:284).

were established in the early 1870s and gave these sportsmen a means of communicating with each other and helped to foster a group identity. These publications also helped to promote a defined code of conduct and attitude around hunting ethics and habitat protection (Reiger, 2001:3).

This first era of wildlife conservation, described by John Reiger in his book *American Sportsmen and the Origins of Conservation* (2001) as being from the 1880s through about 1900, was driven by the private efforts of American sport hunters, who were generally from the elite or upper classes. These individuals sought to facilitate conservation of disappearing habitat and game through the management of private reserves and led efforts to change game laws (Herman, 2001:237-238). Their activities and their influence on public opinion laid the ground work for a shift during the early 20th century to the responsibility of managing wildlife habitat and game species being undertaken by the public sector. The years of the presidency of Theodore Roosevelt (1901-1909) resulted in the expansion of federal programs for resource. Justin Herman, in his writings on the social and political meanings of hunting, presented Theodore Roosevelt and "his fellow Progressives" as not only regulating business and breaking up trusts but also campaigning for game laws and public preserves and thereby democratizing sport hunting during the early 20th century (Herman, 2005:29, 30). "In creating bag limits, game seasons, and game wardens, conservationists abolished pot hunting [individuals who hunted for personal subsistence] and market hunting [individuals who sold game for profit]. By the early 20th century, all hunters, with rare exceptions, were sport hunters" (Herman, 2001:271).

In California, the state began to enact some form of fish and game regulations during the Gold Rush. The state passed its first law—which regulated the right to take and plant oysters—in 1851. Then a year later, the legislature enacted a law that protected elk, antelope, deer, quail, mallard, and wood ducks for six months of each year; however this regulation applied to only 12 counties and its enforcement was left to local authorities and was not uniformly applied (DFG, 1999). It was not until 1870, that the Board of Fish Commissioners (the forerunner of the State's Fish and Game Commission) was established, with a board of three commissioners, to oversee the state's efforts around the restoration and preservation of fish in California waters (DFG, 1999). From the 1890s through about 1900, hunting became more tightly managed and regulated.[3] After the turn of the century, the administration of fish and game laws was strengthened and expanded, and although not implemented until 1909, an amendment to the state constitution from 1901 provided the means to divide the state in fish and game districts to further the state-wide approach to resource management (Grinnell et al., 1918:55; DFG, 1999).[4] By the

[3] During this period regulations were enacted that protected the nests and eggs of game bird, restricted gun size, prohibited night hunting and the sale of game, established bag limits, created the requirement for hunting licenses, etc. Regulations were also enacted to protect individual species (Grinnell et al., 1918:55-61; DFG, 1999).

[4] John Reiger, in his book *American Sportsmen and the Origins of Conservation*, noted that early conservation efforts focused on three areas—wildlife, forests or timberland, and state and national parks (Reiger 2001:3-4). In California, there were parallel movements, that accompanied the establishment of wildlife conservation, to establish state parks and to protect scenic areas, to deal with the loss of timberlands (the widespread planting of eucalyptus trees are a part of this context), and to preserve historic sites.

late 1910s, the creation of the "public game refuge" had begun to address the "problem of the private [owned by one person] and club game preserve, best illustrated at the present time by the familiar 'duck club.' For a long time the duck preserve has been an object of contention among sportsmen, the outsider maintaining that the preserve curtail his liberties by usurping all the available shooting grounds and hence the birds . . ." (Grinnell et al., 1918:23).

Sport hunting enjoyed widespread popularity throughout the country up through World War II. The same outdoor magazines, which in the late 19th century had been aimed at the affluent class, began to "appeal to ever-wider readerships" (Herman 2005:30), and the price of participating in the sport came within the reach of most Americans. "In 1920 rifles and shotguns were produced at half their pre-World War I cost" (Herman 2001: 271.). The number of hunting licenses sold in America doubled between 1910 and 1920. Inexpensive cars, which "made it possible for men of modest means to seek out distant hunting grounds," shorter work weeks, more holidays, and paid vacations (all of which were part of evolving labor practices in the first four decades of the 20th century) all contributed to the widespread popularity of sports hunting. "By 1945, fully one-quarter of American men were sports hunters" (Herman 2001:271).

Trap and skeet shooting clubs developed within the context of this larger conservation movement. Although trap shooting predates the conservation movement, its 19th century evolution from hunting practice into a formal game and the early history of America's trapshooting clubs occurred within the context of the first era of conservation (summarized above). In the early 1900s, trap shooting's popularity was widespread, and Daniel Justin Herman, in his book *Hunting and the American Imagination*, stated that there were 200,000 people participating in some form of formal organization of the sport through 3,000 clubs in 1914 (Herman 2001:227). Skeet which was created in the 1920s has a more direct tie to the second phase of the conservation movement when the responsibility of managing habitat, and thereby providing places and opportunities to hunt, was taken into the public realm. Skeet had spread by the late 1920s to the Bay Area; the Bay Sportsmen's Club (at Fort Funston in San Francisco) and the PRGC (initially on the Napa River) were both formed in the late 1920s and included skeet as one of their activities. Statistics on the sport are hard to obtain, but in 1939, the president of the NSSA an estimated 100,000 people were shooting competitively on fields located at 2,000 gun clubs and 300 golf clubs (Powell, 8-6-1939:4H); this number did not include the number of individuals who used sport more casually for recreation or to hone shooting skills for hunting season.

The hunting clubs that formed in the 1920s and 1930s tended to identify themselves with the wildlife conservation movement and used the term "sportsmen" to describe themselves; this term had direct links to the conservation movement, although it has now become more generic in its meaning (Herman 2005:30). Joe Springer's history of the PRGC, written in 1949, stated that this club "was born as a conservation organization" (Springer, 1949:Part One). The Marin Rod and Gun Club, organized in 1926 and still in existence, stated that the "club was formed for the purpose of conservation, preservation and propagation of fish and game" (MRGC). In addition to their association with the conservation movement, these early 20th century gun clubs illustrate the democratization of hunting that occurred during that period. While clubs continued to exist that maintained private land for hunting, the clubs that formed during the 1920s and 1930s had small land holdings where they may have had a club house (but no onsite game keeper) and possibly a boat launch or a trap or skeet field. Some of the clubs initially had no facilities. For example, the Richmond Rod and Gun Club formed in 1932 did not build any facilities at its site until 1952 (Frenkel, 2014). The Walnut Creek Sportsman's Club formed in 1939 had a clubhouse, in town, but it owned no land until it combined with three other clubs (the Concord Sportsmen's Club, the Bay Point Rod and Gun Club, and Diablo Rod and Gun Club) to form the United Sportsmen, Inc. in 1960 and purchased 75 acres (Gobbell, 2011; Gobbell, 2014). All these clubs utilized public lands and reserves, a product of the 20th century conservation movement, for their hunting activities (Gobbell, 2014; Burke, 2014). Furthermore, most of the clubs formed during this period did not have the exclusiveness of membership, like their predecessors. These clubs, which included members who were working and middle class (Alkalay, n.d.; Gobbell, 2011), had lower operating costs, a greater number of members, and more modestly priced dues when compared to the exclusive and wealthy membership of the private preserves of the late 19th century.

Just as the rise in popularity of sports hunting reflected aspects of American culture in early 20th century, so did its decline after World War II (Herman, 2001:274). The war interrupted sports hunting as well as trap and skeet activities due to the rationing of ammunition and the scarcity of shotgun shells and clay targets. Herman stated, in the article "Hunting and Democracy," that sports hunting probably peaked in the 1940s and 1950s (Herman, 2005: 30). Jan Dizard, in his book *Mortal Danger: Hunters and Hunting in Contemporary America*, noted that the sale of hunting licenses peaked in the late 1950s, and that although the popularity of most outdoor activities continued to be "robust" in the decades after World War II, "participation in hunting stagnated in the 1970s and, by the 1980s, began a slow but steady decline" (Dizard, 2003:42). Herman cited cited several factors that contributed to what he termed the "depopularization of hunting" that occurred after the post-war period; these included the camera (although initially carried by hunters to record kills soon became an alternative to the gun), the popular movie culture of "Walt Disney and his progeny" who projected "anthropomorphic images of animals to millions," the rise in the popularity of team sports (that were "far more representative of today's corporate culture than hunting with its emphasis on self-reliance"), and the rise of other outdoor sports (such as rock climbing, kayaking, skiing, and hiking) which "have replaced hunting as ways for middle class and elite Americans to test their mettle against the forces of nature" (Herman, 2001:272- 273).

D. Development of Trap and Skeet Shooting in San Francisco

Target Shooting Matches

Target shooting matches in America—the forerunners of trap and skeet competitions—developed within the context of the country's colonial era hunting culture. Foster Rhea Dulles pointed out, in his book *The History of Recreation: America Learns to Play* (1965), that after the development of stable communities hunting and fishing came to be enjoyed as sport not just as a means to survive (Dulles 1965:24, 55). This almost universal popularity of hunting throughout the country in the late 18th and early 19th centuries (Herman 2001:54) and the premium that colonial Americans placed on marksmanship contributed to the development of organized target shooting matches. Dulles pointed out that “pride in marksmanship made shooting matches of all kinds even more popular [in the frontier] than they been in the colonies” and that these matches “followed the frontier westward, bequeathing to the more settled communities in the East rifle clubs and trapshooting” (Dulles 1965:71). Set rules for procedures that were “carefully agreed upon” and which included the selection of an “impartial board of judges” developed, and the custom of shooting at a live mark was replaced with shooting at a target (Dulles 1965:71-72; Herman 2001:54-55).

Trap and sheet shooting, the two types of shotgun games located at PRGC, developed within this tradition of target shooting. The sports are similar in that both involve shooting flying clay targets with shotguns. However they developed at different times, and the shooting fields related to each sport have different physical layouts. American Trap uses one machine (the trap) to propel the targets which are all thrown in an outgoing direction; the trap oscillates back and forth throwing out the targets at angles that are unknown to the shooter until they emerge from the house. Skeet uses two machines located at the left (high house) and right (low house) of a semicircle; the machinery in these two houses throws the target in fixed patterns at different angles that are meant to replicate real birds in flight. Both activities started as a way for individuals to practice skills related to hunting and then evolved into sports with codified rules that are practiced for both recreation and competition. Versions of both trap and skeet are included as shooting sports in the Olympic summer games (Migdalski, 1997:13-15; Claytargetsonline.com, 2013). Brief histories of both sports are described below; a description of their associated physical layout requirements is provided in section VI. Description.

Trap

Trap is the oldest of the shotgun games and was established in England by the mid-18th century (ATA, 2013).The sport was first practiced in the United States early in the 19th century and was popular by mid-century in a number of areas, notably in Cincinnati, Ohio and the New York City area (ClayTargetsOnline, 2013). Trap was intended to replicate the experience and utilize the skills of shooting birds in the field, and according to a history of the sport in the *Gun Digest Book of Trap & Skeet Shooting*, "[e]arly trap shooters used live pigeons for targets. Birds were held in a box or “trap” until the shooter 'called for the bird.' An assistant would then pull a string to open the trap’s lid " (Sapp, 2009:17). The use of live birds for sport peaked in the American by mid-century. States began to pass legislation that outlawed competitions using live birds, and there was a growing move to develop methods of putting non-live targets into flight. In 1866, Charles Portlock of Boston improved a "sling devise", in use in England, that launched glass balls. Around 1880, George Ligowsky of Cincinnati developed a flat, disc-shaped clay target. Although, these clay targets were hard and difficult to break, they were preferable to the glass ball targets. In 1881, Ligowsky introduced an improved trap machine for launching his clay targets. An Englishman named McClaskey (none of the references provided his first name) refined the composition of target to include river silt and pitch which became the standard used. (This type of target is also used in skeet.) With the reliability of standard targets and reliable trap machines, interest in the sport accelerated in the 1890s. By this time, the standard arrangement of the game, where a squad of five shooters rotated through five stations while shooting at one trap, had become the standard format. The first national trap championship in the United States took place in New Orleans in 1885. Then in 1890, the Interstate Trapshooting Association was formed to govern the sport; its name was changed in 1919 to the American Trapshooting Association and in 1923 to the Amateur Trapshooting Association (ATA). In 1924, a permanent home was built for the association in Vandalia, Ohio, and the annual Grand American Tournament was held there each year until 2005 when it was moved to Sparta, Illinois to the World Shooting & Recreational Complex (Migdalski, 1997: 4-6; Sapp, 2009: 17; ATA, 2013).

The date when trap shooting first arrived in northern California is not clear. However it seems likely that the sport was present in the late 19th century. The Martinez Gun Club has been in existence since 1883, and in San Francisco, there were "shooting ranges" located along Ocean House Road (today's Ocean Avenue) in the 19th century (LaBounty, 2003:4). The California State Shoot was first held in 1912. The PRGC had a single trap at their original Cuttings Wharf property on the Napa River by 1929. After the club moved to the Lake Merced site in 1934, a trap field is visible in a number of historical photographs in the PRGC collection taken between 1934 and 1937 (before the original fields were abandoned after they were flooded when the lake rose) and on an aerial taken in 1938 (after the fields were moved to higher ground) (see Historic Images 4 and 7). The PRGC was generally known as a skeet shooting group in the 1930s and 1940s. Then in the 1950s, the club added new regulation trap fields and began to regularly host competitive trap shooting events including those associated with the ATA and the Pacific International Trapshooting Association (PITA), an association of clubs in the western United States and west coast providences of Canada that was founded in 1931 (PITA, 2013). This interest in trap occurred after the active trap shooting members from the Fort Mason Rod and Gun Club, with a field and a clubhouse at Fort Funston, joined the PRGC after their clubhouse burned in 1948 (its foundations remain at Fort Funston). The PRGC then became, and continues to be, the only facility in the city to offer trap shooting. Beginning in the late 1940s and continuing through the mid-1960s, the club expanded its trap facilities and built three trap fields, added the machinery to shoot trap to all six skeet fields, and added the "Trap House," a building originally used for registration purposes (Alkalay, n.d.:D; GoogleEarth, 1938; CDSG, 2013; CGSTA, 2013; Martinez Rod and Gun Club, 2013; Martini, 2013; PRGC, 2013; Williford, 2014).

Skeet

Skeet was invented in 1926 by Charles Davies of Andover, Massachusetts who was interested in devising a trap system that would more closely resemble the flight pattern of real birds (than was provided by trapshooting). With the assistance of his son Henry and Henry's friend William Foster, he experimented with various plans before coming up with a field laid out in a circle (with a 25 yard radius) with 12 shooting stations designated around its circumference—similar to the positions of each hour on a clock face—with a trap located at station 12 which propelled targets toward station 6. Participants moved around the circle firing two shots from each station. In 1923, they reduced the radius of the circle to 20 yards, changed the layout of the field to a semi-circle which took less room, and added a second trap (the high house), opposite the first one (the low house), that propelled the target from a higher location. Foster who was the editor for the *National Sportsman* and *Hunting and Fishing* magazines formulated a set of rules to govern this new shooting game. He then published these in the February 1926 issues of the two magazines along with the announcement of a national contest to name the new game. Mrs. Gertrude Hulbutt of Dayton, Montana won the $100 prize with her entry of "skeet" which was an old Scandinavian word meaning "shoot." According to Tom Migdalski's history of the sport, in *The Complete Book of Shotgunning Games*, the national publicity given to the new shooting game by Foster in his magazines, its ability to simulate wild bird shooting without the limitations of closed hunting seasons, and the social aspects of clubs and clubhouses that accompanied skeet, all contributed to the rapid spread of the sport throughout the country. The National Skeet Shooting Association was formed soon afterwards and its first National Championship was held in 1935 in Cleveland, Ohio. The national championship rotated annually around the county, with the 1939 championship held at the PRGC in San Francisco. This championship event was not held during World War II, and skeet shooting (and other target shooting games) was drastically curtailed for the duration of the war due to the limited availability of ammunition and targets. Migdalski commented in his history that skeet actually received a boost during the war: "The military recognized the value of skeet in training personnel to hit moving targets. Consequently, thousands of men were introduced to the shotgun and the game of skeet" (Migdalski, 1997:18), and after the war continued to shoot skeet. The National Skeet Shooting Association was reorganized and incorporated in 1946, and the National Championship was reinstated at Indianapolis in 1946. Now known as the World Championship, it is held annually in San Antonio, Texas at the association's National Shooting Complex (Croft, 1990:99-100; Migdalski, 1997:15-19; Sapp, 2009:59; NSSA-NSCA, 2013; Burke, 2014).

More details about the history of the arrival of skeet to northern California are available than is the case with trapshooting. In the late 1920s, Jules Cuenin, the Rod and Gun editor at the *San Francisco Examiner*, approached local sportsman Lloyd Kahn about finding a place to build a skeet field for this "new sport" which at that point "had reached no further West than Chicago" (Kahn, 1987). They were able to persuade the Army to give them permission to "build a field in a barren area of Fort Funston" (Kahn, 1987). This field became the first in San Francisco and was associated with the Bay Sportsmen's Club, "the pioneer Northern California Skeet Shoot Club" (Alkalay, n.d.:A). Around 1930 or 1931, this group merged with the PRGC, who had built a skeet field at their Cuttings Wharf site in 1929; the combined groups used the PRGC name. Soon after this merger, they were able to persuade the Army to let them move the field to a site "on the highway" which made access easier, and the earlier field was abandoned (Kahn, 1987). The growing popularity of skeet and the demands on its Fort Funston field were such that the PRGC began to look for a new site where they could expand. They found a suitable site just east of the Fort Funston field on the western shore of Lake Merced on land owned by the SFPUC where they constructed two new fields. In 1938, the club constructed four new fields at a higher elevation on the Lake Merced site, after the 1934 fields were flooded, which became, and continue to be, the only skeet fields in San Francisco. Beginning in the late 1940s and continuing through the mid-1960s, the club in conjunction with the expansion of its trap facilities added two new skeet fields to the site. This expansion coincided with the increased interest in skeet that occurred when returning veterans, who had been introduced to skeet as part of World War II training practices, took up the sport (Burke, 2014).

Local Clubs from the Pre-World War II Era

Local sportsmen's and hunting clubs formed in the Bay Area during the 1920s and 1930s within the context of the increased popularity of sport hunting and the increased access to public game preserves that were fostered by the wildlife conservation movement during the early 20th century. These organizations tended to identify themselves with the wildlife conservation movement. As noted in the preceding context on this movement, these early 20th century clubs all utilized public lands and reserves, included members who were working and middle class, and had greater numbers of members and more modestly priced dues when compared to the exclusive and wealthy membership of the private preserves of the late 19th century. Skeet and trap shooting were often part of their club activities since these provided members with a way to improve skills and a framework for a shared social experience within this context. Although it is difficult to obtain a list of clubs that formed during this era, based on information in newspaper articles (that listed the locals of clubs) and the recollections of individuals, most communities had a sportsmen's club. Additionally, many Bay Area military installations also had skeet or trap facilities. Not all clubs had target shooting facilities, and those that did tended to have only one or two fields. The presence of four skeet fields (and often one trap field and a duck tower), a clubhouse, a caretaker's house, and a rifle range building gave the PRGC one of the more extensive pre-World War II facilities. These facilities and the enthusiasm of their active membership provided the club with the means to host larger events (both for competitive and for recreational shooters). Many smaller clubs disappeared during the post-World War II era.[5] They often only leased their land and lost these leases as development surrounded them, those that continued to survive moved or consolidated with other clubs, and most of what are considered to be "older" clubs today actually date from the 1950s (Burke, 2014; Boyle, 2014; San Francisco Chronicle, 1939; Cuenin, 1939).

The PRGC appears to have the oldest skeet and trap facility in the Bay Area and retains its original pre-World War II grounds configuration, skeet field structures, and club buildings. Other clubs that remain in operation from this pre-World War II era do not have skeet or trap facilities (for example, the Marin Rod and Gun Club [established 1926]) and the Stockton Rod and Gun Club [established 1937]), have moved to newer facilities and are no longer located at their original sites (for example, the Martinez Gun Club [established 1883] moved to its current site in 1961), or developed their facilities

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5 For example, clubs from this era that are no longer in existence included ones in Novato, Palo Alto, Petaluma, Redwood City, Sonoma, and Tracy (Cuenin, 1939; Burke, 2014; Boyle, 2014; Marazzani, 2014).

after those at the PRGC. In this latter group, the Richmond Rod and Gun Club, which formed in 1932, did not buy its property and begin development on its facilities until 1952 (Frenkel, 2014; Sargentini, 2014). In 1960, four smaller clubs (Bay Point, Diablo Rod, Walnut Creek, and Concord) which did not have shooting ranges, joined together in 1960 to form the United Sportsmen Inc. and purchase a 75-acre site (Gobbell 2011 and 2014). The Stockton Skeet and Trap Club, which holds major tournaments and is considered one of the premier sites to shoot competitively, was not formed until the mid-1950s (Burke, 2014; Boyle, 2014).

V. HISTORY OF PRGC AND SITE EVOLUTION

Following the discussion of PRGC's establishment and early development, this section provides the history of PRGC organized by the club's periods of development at Lake Merced. The period 1934-1941 encompasses PRGC's move to Lake Merced and the development of the property when the arrangement of the features within the site was established and when its major buildings and four of its skeet fields were constructed. During this 1934-1941 period, the club spearheaded the establishment of sports fishing at Lake Merced and helped to establish skeet shooting in the Bay Area. Its facilities provided a regular venue for the range of social experiences and activities associated with sportsmen's clubs during this pre-World War II era. This initial period of development ended in 1941 when the United States entered World War II. From 1942-1945, most of the club's regular activities were curtailed due to the war; this was a general wartime experience for sportsmen's clubs throughout the country and was not unique to the PRGC. After the end of World War II, the various club and shooting activities returned to the PRGC property, and the club began an extended period of growth and expansion between 1946 and the early 1960s that resulted in the addition of new skeet and trap fields, the addition of one new building (the Trap House), and the expansion of another (the Shell House). The period from the mid-1960s through the early 2000s included minor alterations to the property but resulted in no major additions of buildings or field facilities.

A. Establishment of the Club

The PRGC was established in early 1928 with an initial membership limited to 50 by a group of San Francisco sportsmen and was incorporated on June 6, 1929. Based on the information in the club's "Early History", prepared by its first president Joe Springer for publication in the club's newsletter in 1949, the club was formed as a conservation organization with membership initially focused on sports fishing. In additional to recreational fishing, club members participated in regional and national sports fishing events. In competitive surf casting in the early 1930s, member Primo Livenais held the record for an individual cast and the club's team broke the world record for a team score. The club was actively involved in "in the campaign to take striped bass off the commercial market," and was also instrumental in testing and planting sport fish in Lake Merced in the 1930s. An article in the *San Francisco Chronicle* described the first opening day on Lake Merced for sport fishing, on July 1, 1939, as a culmination of seven years of efforts "fathered" by Joe Springer, the president of the club from 1928 through 1932 (Springer, 1949: Parts One and Three; Alkalay, n.d.:A; Powell, 7-3-1939:3H).

Initially, the club leased land at Cuttings Wharf on the Napa River where they built a clubhouse that provided accommodations for members to spend the weekend while they hunted or fished and a site for social gatherings. The clubhouse included a bunkroom that would sleep about 20, a large dining room that was able to accommodate about 50 people, a kitchen, and shower and toilet facilities. The official opening of this new clubhouse was a "grand three day affair" over the weekend of February 22-23, 1929. The club's first president Joe Springer described the festivities as "staring off with a big dinner Saturday night, followed by boat races on Sunday, fishing for prizes, trap shooting (we had a single trap) and many other activities" (Springer, 1949:Part One). The club expanded its shooting activities in 1930 by adding a single skeet field at the Cuttings Wharf site. Although skeet was only four years old as an organized sport at that time, it was rapidly growing in popularity, and new fields, like this one, were popping up throughout the country (Springer, 1949: Part One; Migdalski, 1997:15).

B. The Move to San Francisco and Pre-World War II Development of Lake Merced Site

The club's involvement with skeet increased and its geographical focus began to shift to San Francisco around 1930-1931 when the Bay Sportsmen's Club, the "pioneer Northern California Skeet Shoot Club," merged with the PRGC (Alkalay, n.d.:A). Because the PRGC was the larger of the two organizations and had a meeting room, the combined groups decided to use the PRGC name (Kahn, 1987). This association added a new contingency of skeet shooting enthusiasts to the club—three of whom would later serve as president for the PRGC (Alkalay, n.d.:A]—and the PRGC took over the Bay Sportsmen's Club single skeet field at Fort Funston. Springer described this facility as "a rather crude affair" with no storage facilities so that it was necessary to cart the targets, ammunition, and batteries to and from the field each shooting day. Soon after the merger, the club was able to persuade the Army to let them move the field to a site "on the highway" [Skyline Boulevard] which made access easier (Kahn, 1987) (see Historic Image 1). The club became increasingly involved in skeet after it acquired this field at Fort Funston. Its five-member team went to Nevada City in May 1931 for the Northern California Skeet Championship Shoot and to Los Angeles in July to compete for the state team championship.[6] Also during 1931, the PRGC hosted a "charity shoot" in December "for the benefit of the San Francisco News Neediest Families Fund" (Springer, 1949:

[6] Two of the members of this 1931 team—Jules Cuenin and Don Westwater—are members of the CSSA's Hall of Fame. Cuenin, a sportswriter for the *San Francisco Examiner* and one of the club's original members, was inducted into the Hall of Fame based primarily on his efforts to promote skeet during its early years through his sports writing. However, he also ranked among the country's elite shooters during the 1930s and was a Second Team All-American in 1930, 1932, 1933, and 1934. During that era, members of the All American teams were selected by Jimmy Robinson, editor of *Sports Afield* who was considered the preeminent sportswriter on the game during this era, based on their wins in shooting competitions in comparison with other shooters from all over the country (Burke, 2014). Westwater was inducted into the Hall of Fame based on his shooting abilities. His prime years of competition were interrupted by World War II, but he continued to shoot competitively into the 1950s and was ranked as a Second Team All American in 1955 when he was in competing against much younger individuals (Burke, 2014).

Part Three), which was the first in an ongoing club tradition of hosting shooting events to raise money for local organizations (Springer, 1949:Parts One, Two, and Three).

The club's membership limit was doubled in 1931 to 100, and by 1933, the growing popularity of skeet and the demands on its Fort Funston field were such that members began to look for a new site where they could expand. They found a suitable site just east of the Fort Funston field on the western shore of Lake Merced on land owned by the SFPUC. This site provided some fairly level terrain immediately next to the shoreline. The level terrain helped to minimize the amount of grading that was required to build level skeet fields for the club's shooting enthusiasts, as well as providing easier lake-side access for their fishing contingency. San Francisco Mayor Angelo Rossi helped to smooth the way for a lease, after some initial local opposition raised by golfers and horseback riders to the development of the facility at this site, and the club entered into its initial lease agreement with the SFPUC in 1934 (Springer, 1949:Part Three). The SFPUC's annual report for fiscal year 1933-34 cited the lease with the PRGC as one of two steps taken by the commission "toward improvement of the recreational facilities of the people of San Francisco" during that fiscal year (SFPUC 1934:7).[7] The report noted that "with the arrival of Hetch Hetchy water, the water produced by Lake Merced will be required only in an emergency" so the commission "leased an area in the neighboring tract to the Pacific Road and Gun Club for use as a skeet shooting field. The club was also permitted to plant black bass in the lake, it being expected that fishing will be later enjoyed there by our people" (SFPUC 1934:7).[8]

The club's members built two skeet fields and an entrance road, which provided access to the site from the east, and dedicated the new facility on June 9 and 10, 1934 (see Historic Images 2 and 3). The construction of these facilities began the PRGC's initial period of development at Lake Merced that continued until the United States entered World War II in 1941. In recognition of his assistance in securing the site, Mayor Rossi fired the first shot at the dedication ceremony; however "a [club] member behind the high house actually fired the shot that broke the target" (Springer 1949: Part Three). Other features which are visible on aerial and historical photographs from this era included a trap field located to the west of the eastern skeet field, a large unpaved parking area, and a small wooden building (the "Lunch Room"), a stone barbeque, and picnic tables in the southeastern corner (see Historic Image 4). An internal unpaved road linked the two skeet fields. A large stand of trees, made up of mostly eucalyptus trees, that pre-dated the club's use of the site stretched across the site and provided a boundary along the south side. Club members planted a row of evergreen trees to delineate the boundary at the southeastern corner. The PRGC continued to prosper and voted in November 1936 to double its membership to 200. A new clubhouse was opened on July 25, 1937, and at that time, the club "gave up the clubhouse on the Napa River" (Springer, 1949: Part 4) and became exclusively identified with its Lake Merced site (see Historic Image 5). A

[7] The other step that the report noted was the leasing of a portion of the Amazon reservoir site for the development of a new playground for the southern section of the city (SFPUC, 1934:7).

[8] According to Springer's history the stocking continued on a regular basis: "Many shipments of bass were planted in the lake from time to time under the supervision of the black bass committee of this club so that the public might enjoy a little fishing" (Springer, 1949:Part Four).

caretaker's house was also added around this same time, although an exact date of construction has not been established. Then in late 1937, the lake rose several feet and flooded out the fields (see Historic Image 6). The club was forced to relocate its facilities to higher ground about 50 feet to the west. The club cut down most of the large stand of eucalyptus trees in order to clear the site for the new fields, although a small band of the trees were left standing in the vicinity of the clubhouse. By April 10, 1938, they had constructed four new skeet fields, which continue to exist today as Fields 4, 5, 6, and 7. By the time these new fields were built, the alignment for John Muir Boulevard was in place and provided easy access to the site. The original entrance road was abandoned, and a new entrance (with a rustic wooden gateway and sign) was established at John Muir Boulevard across from the new fields (the location of the present-day entrance). A fence (originally rustic in appearance to match that of the new gateway and sign) was added that delineate the boundary between the skeet field site and the road (see Historic Images 7 to 9). An indoor Rifle Range building was added in March 1939 just east of Field 7; the club's first rifle team had been formed in 1934 (Pacific Aerial Surveys, 1935; Google Earth, 1938; Springer, 1949: Part Four; PRGC, 2013).

C. Events Held at the Club in the 1930s

After the opening of the new facilities at the Lake Merced site in 1934, the club began to host regional and state skeet championships. During the 1930s, when travel was more limited than it is today, these regional and state events provided local shooters the opportunity compete and helped to promote the game (Burke, 2014). A list of competitive tournaments hosted by the club in the 1930s and up through the country's entry into World War II include the Northern California Skeet Championships (1934, 1939, and 1942), the Western Open Championships (1934, 1935, 1937, and 1941), and the California State Championships (1934, 1935, 1936, and 1938) (Springer, 1949:Parts Three to Six). The club hosted hunter safety classes and continued its practice of holding benefit shoots to raise money for various causes including the Shriners, the Catholic Youth Organization (CYO),[9] and Ducks Unlimited. L. N. Alkalay, club president in 1940, considered the club's efforts to raise funds for the establishment of a Ducks Unlimited Project in Canada known as Lake San Francisco to be its "greatest conservation project." Alkalay claimed that this led to "many other sportsmen's groups throughout the United States sponsoring similar projects in their names" using this "procedural format established originally by the Pacific Rod and Gun Club (Alkalay, n.d.:C). The club

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[9] A write up in the *San Francisco Call* for the fifth annual CYO Charity Shoot, held on April 27, 1941, provides a sense of these types of events held at the club during this era. The event was expected to include "hundreds of scattergunners" and participants with a range of experiences ("experts, strictly game hunters and rank novices"). There was an educational component ("Not only will the fine points of the skeet game be explained to novices by class A or professional shooters but the experts will actually accompany newcomers during their rounds of shooting to assist in every way possible and make them at home with a gun on a skeet field") and a "clergy shoot" ("One of the most interesting events of the day will undoubtedly be a skeet contest for members of the clergy"). Trophies were donated by local businessmen (the Beale brothers of the Mission Automobile Parts and Marine Supplies Company) and lunch was provided for sale (as part of the fundraising) by club members—a barbeque steak (for 75 cents) or for the person who was not a "heavy luncher" there were "sandwiches, coffee, and whatnot" (Dearing, 1941).

hosted events that celebrated regional events and history. In 1937, they held the Golden Gate Bridge Fiesta Skeet and Trap shoot to celebrate the opening of the bridge. The 1939 National Championship (described below) was one of the sporting events held during the GGIE.

D. 1939 National Skeet Championships

The PRGC's prominence within the skeet world of the 1930s was firmly established when it was awarded the fifth National Skeet Championships to be held at the club on August 8-12, 1939. Previous championships had been held in Cleveland (1935), St. Louis (1936), Detroit (1937), and Tulsa (1938). The decision to hold the event in San Francisco increased the cost of travel for many participants, but was important because it was the first time that the national championships were held in a west coast location, which indicates how the game had spread in the decade and a half after its invention (Skeet Shooting News, 1939: 1). *Skeet Shooting News*, the official publication of the NSSA, emphasized that the championships provided the participants and attendees, from all parts of the country, Hawaii, and some foreign counties, a chance to complete, meet each other, and to leave with "a fuller understanding and appreciation of skeet as a country-wide sport rather than something unique to their own particular locality" (Skeet Shooting News, 1938:7). The San Francisco event, which became the "biggest shooting event ever held to date in the west" (Springer, 1949:Part Five) helped to reinforce the popularity of the sport in Northern California (Burke, 2014).

According to Springer's account of the event in his history, the club worked for three years to secure the event from the National Skeet Shooting Association. L. N. Alkalay, vice chairman of the club's executive committee for the event, traveled throughout the country to skeet clubs to promote the National Championships in San Francisco (Burke, 2014).[10] The club received local assistance from the San Francisco Tourist and Convention Bureau who helped pay for club member Hugh Richardson's "trip to Tulsa to complete arrangements and to gain a favorable vote from the National Association" (Springer, 1949: Part Five). The championships coincided with the GGIE, the World's Fair held at Treasure Island in the summer of 1939, which celebrated the opening of the Golden Gate and Bay bridges. According to L. N. Alkalay's club history, the National Skeet Championships was considered one of the "gala and official" events associated with the exposition (Alkalay, n.d.:B).[11]

[10] Alkalay is one of three PRGC members, along with Jules Cuenin and Don Westwater, who are members of the CSSA Hall of Fame. Alkalay was vice chairman of the club's executive committee for the National Championship and was president of the club in 1940. He became president of the Northern California Skeet Shooting Association (NCSSA) and editor of its publication "The Skeeter in 1942 and again in 1948. He is credited with being instrumental the reorganization of the NCSSA in 1947 which contributed to the renewed interest in skeet after World War II. He also served on the board of directors for the reorganized national organization (NSSA) following the war (Burke, 2014).

[11] Two other sporting events held in conjunction with the GGIE included the International Lawn Bowling Tournament held September 4-16, 1939 on greens in San Francisco, Oakland, and Berkeley and the national surf casting championship, which was won by the PRGC team (Cuenin, 8-4-1939: 26; San Francisco Chronicle, 9-5-1939:3-H; Springer, 1949:Part Five)

The city assigned part of its WPA funding to assist the club in preparing the site for the tournament (refer to the historic context on the WPA for more information on the role of the WPA in Depression-era recreation construction). The area to the south of the four fields was still sloped and covered in brush at this point. The WPA work force cleared this site and graded it for the large parking lot that was needed for the national championships events. They also graded the field area (Healy, 1939: 65; Springer, 1949: Part Five). In addition to the four fields, laid out in 1938, which were already in place, four temporary fields were added for the event. Having eight fields and a parking area were two of the commitments the club had to make to the NSSA in order to host the event (Skeet Shooting News, 1938; Cuenin, 1939:21; Springer, 1949:Part Five). No description was provided in any of the sources reviewed for this report as to where these fields were located. However, Historic Image 10, shows two fields located northwest of Field 4 in the area occupied by present-day Fields 1 to 3. Given the geography of the site, the two other fields were likely added to the open area at the southern end of the site, today occupied by Fields 8 and 9. No evidence of these fields remained on the site in 1948 when Historic Image 12 was taken.

The success of the event enhanced the PRGC's reputation within the skeet world. Almost 200 shooters participated from 27 different states (Skeet Shooting News, 1939:1). A report on the event in *Skeet Shooting News* stated that this had been the "most nearly perfect shoot, considering all aspects in the history of the national competition." The account credited the location, equipment, and management of the tournament as factors contributing to its success. The article stated that the "[e]quipment and layout at the Pacific Rod and Gun Club was the finest ever placed at the disposal of the national championship competitors. The many permanent buildings of the club added greatly to the comfort of the shooters and those responsible for managing and cashiering the meet" (*Skeet Shooting News*, 1939:2). Jimmy Robinson, trapshooting and skeet editor for the national sports magazine *Sports Afield* was publicity director for the event. Newsreel companies, photographers, and the local newspapers, which gave front sports page coverage to the event, provided what was declared to be the "best press coverage it had ever enjoyed" (*Skeet Shooting News*, 1939:2). The closing banquet at the Fairmont Hotel was attended by 350 "shooters, friend, and officials" where awards and trophies were presented by Mayor Angelo Rossi and NSSA president Henry Ahlin. It was the first of the national championships "to be concluded entirely 'in the black' as a complete financial success" (Alkalay, n.d.:B).

After the event, the club's fourth building was added in late 1939 or early 1940 just west of Fields 4 and 5. This building, known as the Shell House, was constructed from lumber recycled from the wooden platforms that had been erected during the championships by the "Ammunition Companies to display their wares and entertain their friends . . ." (Springer, 1949:Part Five) (see Historic Image 10).

E. World War II

As was the case throughout the country, the shortage of shells and targets during World War II limited shooting activities at the club. Following the United States' entry into World War II in December 1941, activities changed at the PRGC. Initially the club planned to continue in a "conservative way" to hold shoots on the grounds and to "entertain visitors who can provide their own ammunition, an ample stock of targets still being on hand (PRGC Digital Archive: Newspaper clipping ca. 1941-42). By the end of 1942, wartime rationing altered the activities further. An article in the *San Francisco Examiner* announced that "due to dim-outs and gas rationing the club is compelled to temporarily seek a more central location for its meetings" and so they moved the meetings to the band room at the Islam [Shrine] Temple at 650 Geary Street (Betten, 1942:17). Shooting was limited to every other Sunday and competitive events were suspended, except for the 1942 California Skeet Championships that occurred before shooting was largely curtailed due to the limited availability of shells and targets (Springer, 1949:Part Six). Instead of the regular club shooting activities, the site was used in a number of other ways for the duration of the war from 1942-1945, several of which aided or supported the war effort. During 1942, the PRGC provided shotguns, targets and ammunition, and shooting instruction to train thousands of military recruits at the club (Alkalay, n.d.:C)—"shooting seven days a week and eight hours a day" (Springer, 1949:Part Six). Additionally, in conjunction with a local Islam Temple, barbeques for 500 servicemen were held at the site in October 1942 and 1943, and in 1943 a vaudeville show was held for the Coast Guard at the clubhouse.[12] As a way to fill the void left by the lack of shooting opportunities, the "Rough Grouch Horseshoe Club" was formed, several horseshoe pits were installed on the grounds, and weekly games were held until the regular shooting schedule could be resumed following the war (Springer, 1949:Part Seven). Springer's history does not provide any information on the location of the horseshoe pits, and no evidence of these features remains today.

F. The Post World War II Development of the Site

After the end of World War II, shooting activities returned to the PRGC site, and the club began an extended period of growth and expansion that occurred between 1946 and the early 1960s. The club voted in 1948 to increase membership to 225, and in 1949, they had reached this level and had a "sizeable waiting list" for membership (Springer, 1949:Part Seven). Club membership during this period included a cross section of the city's population from "day laborers to high placed financiers" (Alkalay, n.d.:2).[13] On June 12, 1949, the club celebrated its 15th anniversary at the Lake Merced site and opened the new lunch room that had recently been added to the west end of the Shell House (Springer, 1949:Part Eight). Then during the late 1940s, 1950s, and early 1960s, the PRGC constructed additional fields to meet the demand for shooting facilities.

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12 The club purchased skeet traps for the Fourth Air Force for the entire Pacific Coast. They also shipped a "large quantity" of fishing tackle overseas to servicemen in conjunction with the San Francisco League of Service Men (Springer, 1949:Parts Six and Seven), and San Francisco became the "largest center for collecting tackle and equipment and putting it in shape for the leisure and emergency use of fighting forces overseas" (San Francisco News, 7-24-1943: 7).

13 Based on a review of the club newsletter, *The Pacific Breeze*, the club was open to the public, but members were charged a discounted field use rate. However, when the club was first opened to public for routine use, or if this was always the case, was not found.

This expansion was driven by several factors, some of which were related to broader trends in American society and others which were more specific to skeet and to the PRGC. Jan Dizard, in his book *Mortal Stakes: Hunters and Hunting in Contemporary America*, noted that the popularity of many outdoor activities increased after the war. The extended period of prosperity that followed the war brought increased wages, a measure of job security for much of the nation's workforce, and paid vacations for more people which meant that "Americans in rapidly expanding numbers had both the money and the leisure time to pursue hobbies of all sorts; visits to state and national parks soared, the ranks of bird-watchers grew, and . . . fishing and hunting grew in popularity, with hunting, as judged by the license sales, peaking in the late 1950s" (Dizard, 2003: 42). Some of the growth at the PRGC was tied to this broad interest in outdoor recreation that occurred within the context of the post-war prosperity. Additionally, the expansion of the club's skeet facilities occurred within the context of an increased interest the game that was the result of returning veterans, who had been introduced to skeet as part of World War II training practices, taking up the sport (Migdalski, 1997:18; Burke, 2014). Some of the club's expansion can also be attributed to gaining new members who were active trap shooters when members of the Fort Mason Rod and Gun Club joined the PRGC when their clubhouse at Fort Funston burned in 1948 (Alkalay, n.d.:D; Martini, 2013; Williford, 2014).

Although the club had a trap field on site in the 1930s (see Historic Images 4 and 7), until the influx of the trap shooters from the Fort Mason club in the late 1940s, the PRGC had been primarily a skeet shooting group.[14] With the addition and interest of these new members, the club expanded its trap facilities and began to host "regular registered trap shooting programs" (Alkalay, n.d.:D).[15] Springer writing in 1949, in his club history, stated the new trap field layout (constructed between 1949 and the early 1950s) would "when finished make ours one of the best" (Springer, 1949:Part Eight). An informal trap field complex is visible at the far west end of the site on a 1948 aerial photograph. By 1950, one of the improved trap fields (Field 3) was complete, and the parking lot (which had previously ended in the vicinity of the Shell House) had been extended westward to its current location. By 1955, two more trap field (Fields 1 and 2) were in place. The Trap House, originally used as for trap registration, was added just west of the new trap field complex between 1960 and 1961 (PRGC, Information attached to past presidents' photographs [Hanley/1960 and Del Nevo/1961] in Clubhouse; Pacific Aerial Surveys, 1948, 1950, 1955, and 1958; Cartwright Aerial Surveys, 1965).[16] The Trap House was the

[14] Alkalay is stating the focus of the club's competitive activities centered around skeet, not that there were no trap facilities on site prior to 1948. Interviews with members of other clubs, conducted during the research of this report, confirmed that it is typical for clubs to generally be recognized for one sport or hold competitions for one sport even when they have facilities for others.

[15] Tom Migdalski explained, in his history of the two activities in *The Complete Book of Shotgunning Games*, that "serious trap and skeet shooter generally stay with one game . . . The problem of becoming competent in both events is the time factor. To be a good shot requires practice. Field and personal time, as well as financial wherewithal, often make it necessary that a serious shooter choose to concentrate on one game" (Migdalski, 1997:14).

[16] The Trap House was originally referred to as "Hanley Hall" in honor of club president Harold Hanley "in appreciation of his personal efforts and generosity toward its construction during his term" (PRGC, Information attached to past presidents photographs [Hanley/1960] in Clubhouse).

last major building constructed to support PRGC operational or social activities. See Historic Images 12 to 16 for an overview of these site developments.

The club also expanded its skeet facilities during the 1950s, and in 1953, two new skeet fields (Fields 8 and 9) were added to the east end of the site. These new trap and skeet fields utilized concrete instead of dirt or boardwalk which had previously been used for the path system within each field. The wooden boardwalks for the semi-circular skeet station layout in the four 1938 skeet fields (Fields 4 to 7) were also replaced with concrete around this same time. In 1957, concrete pavement stamped with trap yardage markers was added to the interiors of Fields 4 and 5 allowing them to be used for both skeet and trap; this same type of pavement was added to Fields 6 and 7 between 1965 and 1969. In 1958, Dr. L. N. Alkalay built a steel-frame duck tower in an unspecified location; the structure added west of Field 6 between 1958 and 1965 (that continues to exist today) may be this feature. This was not the first duck tower on the site; an earlier one appears in a late 1930s photograph in the area north of the present-day Rifle Range building (see Historic Image 5) (PRGC, Information attached to past presidents' photographs [Alkalay/1940; Connelly/1953; Appleton/1957] in Clubhouse; Pacific Aerial Surveys, 1948, 1950, 1955, 1958, and 1969; Cartwright Aerial Surveys, 1965). See Historic Images 12 to 17 for an overview of these site developments.

From the mid-1960s through the early 2000s, PRGC went through modest changes to its buildings and grounds. Around 1965, a modern restroom building added to the northwestern edge of the parking lot. Recent additions to the site include a three-bay garage constructed near the entrance around 2000 (GoogleEarth), new shooting stands and equipment sheds to Field 6 to allow it to be used for the Five-Stand game (GoogleEarth, 2004 and 2005). Beginning in the late 1980s or early 1990s, the planting strip located along the western edge of the Fields 4 to 7 was no longer maintained. This area was originally planted with grass and later with ornamental shrubs (see Historical Image 11 for a view from the 1960s) as a way to create a transitional area between the fields and the parking lot. There were gaps in the planting strip at each field that provided a clearly defined entrance into each field. At some point after this area stopped being maintained, a chain-link fence was installed along the edge of the field and sidewalk (that also runs the length of these fields) (Pacific Aerial Surveys, 1948, 1950, 1955, 1958, 1969, 1979, 1985, and 1995). In 2011, the machinery on Field 7 was recalibrated to shoot Olympic/International skeet to provide a convenient practice field for Ali Chiang, a club member and a member of the U.S. Women's National Team member who is vying for the alternate position on the 2016 U.S. Olympic skeet team. However, the use of this field for that version of skeet required no changes to the physical features of Field 7 (Gentry, 2012:58; Gilligan, 2013).

G. Post World War II Events and Site Usage

The club also resumed hosting competitive tournaments after World War II including the Western Open Championship (1946 and 1949) and the California State Championship (1946 and 1947) (Springer, 1949:Parts Seven and Eight) and continued its practice (begun in 1931) of hosting regular "fun shoots" and annual "benefit shoots" for a number of local organizations including the Shiners, Ducks Unlimited, and the Catholic Youth

Organization Benefit. These events involved community members with a wide range of skills (not just the competitive shooters who attended the championship events) and were often large affairs; for example the Ducks Unlimited shoot in 1946, which had drawn almost 400 entries in 1937, involved over 600 shooters. In 1948, the Portola Festival Skeet and Trap Shoots—complete with costumed riders on horseback and others dressed as “Don Gaspar, his aids, the queen and her ladies in waiting”—celebrating the city’s Spanish era roots was held at the site (Springer, 1949:Part Seven). Also, as illustrated by the list of activities provided by Springer at the end of his club history, the site was actively used by a range of local organizations including the Boy and Cub Scouts, other sportsmen’s clubs, Legion posts, Shrine organizations, and city departments for barbecues, picnics, meetings, and other functions. In the post-World War II years, the club remained a well-known skeet shooting destination. Life-long member and All-American skeet shooter Ray Brooks Jr. described the late 1940s and the 1950s as the “glory years” at the PRGC when the site was a destination for guest celebrities, many in the entertainment industry, who came to shoot skeet (Brooks, 2013). Throughout the remaining decades of the 20th century, the club’s trap and skeet fields and its rifle range continued to be actively used by members as well as the general public (Boyle, 2014). A review of the club’s newsletter, the *Pacific Breeze,* during the 1960s through the early 1990s showed that regularly scheduled shooting events in addition to the normal hours of operation, hunting safety classes, the use of the site by youth organizations, and social events were typical activities.

Beginning in 1993, the use of lead shot was discontinued at the club (today only non-toxic shot is allowed) (SFPUC 2011:27-28), and although this change did not alter the physical layout of the site, it did result in the loss of approximately 150 of the club’s 450 members (in 1995) (San Francisco Examiner, 1995: A-26). Many of these members left for a variety of reasons related to this change. The steel shot was believed to be damaging to the shotguns that some of the members owned. Steel and bismuth shot were more expensive than the lead. Additionally, practicing with steel shot, which is both harder and lighter than lead shot and so behaves differently, is not practical for individuals who shoot competitively (Boyle, 2014). The change to non-toxic shot has meant that the club no longer hosts competitive regional or state championship events since these are held with lead shot (Gilligan, 2013). Membership rebounded after this initial decline, and today the club has approximately 400 members (PRGC, 2013).[17]

The club’s involvement in fishing at Lake Merced declined as the quality of the lake’s water declined and restocking of the fish became more irregular (Gilligan, 2013). Additionally, access to the lake became more limited following the closure of Lake Merced boathouse which ceased renting boats, and as the condition of its boat launch areas and fishing piers declined (SFPUC, 2011:23; LMYFP, 2013). The club has recently

[17] The Richmond Rod and Gun Club, whose trap and skeet fields are located adjacent to San Francisco Bay, experienced a similar pattern when they, too, stopped using lead shot. They lost about 75 percent of their membership and then slowly added new members. Today the club has about 3,000 members, but the majority of its events are related to rifles and pistols rather than shotguns (Frenkel, 2014; Sargentini, 2014).

partnered with the Golden Gate Angling and Casting Club and others on a youth fishing program at the lake (Gilligan, 2013).

VI. DESCRIPTION

A. Location, Land Use, and Spatial Organization

The PRGC is located on the narrow strip of land approximately 10 acres in size that is situated between the shoreline of the South Lake of Lake Merced and John Muir Drive, just east of the intersection with Skyline Boulevard.

The primary land use at the PRGC site is outdoor target shooting. Features associated with this land use include its three trap fields, the six skeet fields, a large parking lot, and buildings that support its operational and social functions including the Clubhouse, the Caretaker's House, the Shell House, the Trap House, the Barbeque Shed, a garage, and metal storage containers. The site also contains a Rifle Range building which provides indoor shooting range, and a public restroom building. With the exception of the barbeque shed, the restrooms, the metal storage containers, and three-car garage that are support buildings and structures not directly associated with shooting activities, all of the field facilities and buildings at PRGC were built between 1937 and 1961.

This arrangement of features—the site's spatial organization—has been shaped by the needs of this primary land use and by the long and narrow shape of the site situated between the lake and a public road. The shape of the site, the need to set the shooting activities back from the road, and the need to provide a safety zone for the falling targets (a shotfall zone)[18] resulted in the linear arrangement of the skeet and trap fields along the edge of the site next to the lake. The large parking lot and an internal road occupy the middle portion of the site and, in addition to their utilitarian circulation functions, provide the needed spatial setback for the shooting activities from John Muir Drive. The locations available for buildings and larger structures (including a metal storage shed, the Clubhouse, the Caretaker's House, a garage, and a public restroom) are limited by these functional needs to the edge of the site next to John Muir Drive, along the edges of the parking lot (the Shell House, Trap House, and restrooms), and on small area between Field 7 and Field 8 (the Rifle Range building and the Barbeque Shed).

B. Topographic Modifications and Boundaries

The PRGC site is relatively flat but slopes slightly down from its south side next to John Muir Drive toward the lake and from the entrance down toward the east end of the property. (Cardinal directions are used in describing the site; south refers to the area next to John Muir Drive, north is used to describe the shoreline, east and west are used respectively to describe the two ends of site.). The shoreline drops off steeply at the north end and northwest portion of the site, but, according to the characterization of the site in the *Lake Merced Watershed Report*, the remaining shoreline interface is "generally much more gradual than is typical for shoreline conditions around the lake" (SFPUC, 2011:14).

[18] The portion of the shotfall area that extends out into Lake Merced is outside of the lease area for the PRGC and outside of the boundary of the PRGC cultural landscape.

The topographic modifications to the site are related to its use and function as an outdoor target shooting range and club. These include the large level terrace for the parking lot and trap and skeet range (Fields 1 to 7) which occupies the majority of the area on the western portion of the site, the smaller terrace where Fields 8 and 9 are located on the east end of the site, and a bank that extends along the south side of the site that provides the transition between the elevation along John Muir Drive and the lower elevation of the site. Minor topographic modifications include the leveling of the area that accommodates the footprint of Clubhouse and Caretakers House which are located immediately to the north of the south-side bank. Refer to Photos 3, 31, 22, 29, and 35 for representative images of these topographic features.

The shoreline defines the site's geographic or physical boundary on its northwest corner and its north side. Chain-link fences define the boundary at the site's southwest corner, along the top of the bank along the south side (next to John Muir Drive), and at its east end. The fence at this location is overgrown with vegetation.[19]

C. Circulation Features

The entrance to the PRGC is from John Muir Drive, located approximately two-thirds down the site's south side, and is framed by a metal pole gateway from which hangs a large sign. The club's logo is on the right side of the sign and the left side reads "Pacific Clay Targets / Trap, Skeet, and Sporting Clays / A Public Recreation Facility." A chain-link gate secures the entrance under the gateway. Refer to Photo 1 for a representative view of this sign.

A large parking lot extends from the entrance toward the western end of the site and occupies the broad expanse between John Muir Boulevard and the field complex. It covers approximately two acres and provides the primary parking area for the site. The portion of the lot east of the Shell House is paved with asphalt and the portion behind (south) and west of this building is gravel. Refer to Photos 2 and 3 for representative images of the parking lot.

A concrete sidewalk runs along the north edge of the parking lot for the length of the 1938 skeet field complex (Fields 4 to 7). At its west end by Field 4, the sidewalk curves and intersects with an asphalt path located along the west side of the trap field complex (Fields 1 to 3). The portion of concrete walk from the Shell House westward is wider than the portion east of the Shell House. Refer to Photo 10 for a representative view of this sidewalk.

An internal road extends from the entrance toward the site's east end; its east end is roughly aligned with station 4 of Field 9. This road provides both pedestrian and vehicular access to the caretaker's house, clubhouse, Fields 8 and 9, storage containers, and trash dumpster. Refer to Photo 35 for a representative image of this road.

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19 The portion of the shotfall area (the safety zone for the falling targets) that extends out into Lake Merced is outside of the lease area for the PRGC and outside of the boundary of the PRGC cultural landscape

D. Buildings and Structures

Buildings on the Western End of the Site (Shell House, Trap House, and Restroom Building)

Two club buildings—the Shell House (ca. 1939 and expanded in 1949) and the Trap Building (ca. 1960) —that house functions related to the operation of the PRGC facility are located within the parking lot on the western end of the site. Additionally, there is a small ancillary structure, a public restroom (ca. 1965), located approximately three-quarters of the way down the southern edge of the parking lot.

The Shell House is located on the northern edge of the parking lot across from Fields 4 and 5 with the front of the building facing north toward the skeet fields. This building contains an office, a storage area and concessions bar, and a lunch room. It is where club members check in and purchase shells and targets. The building is a wood-frame, single story structure with a rectangular footprint and low pitch gable roof. The exterior of the building is covered with textured stucco, and the roof extends over a raised porch on the northern façade. The porch is accessed via a series of concrete steps and leads to a pair of sliding glass doors framed by a pair of large picture windows. The eastern façade includes a double hung window patched with plywood, a metal door accessed by concrete steps and topped with an overhang and metal sign reading "Field House," and a wood frame, fixed pane picture window. The building has an addition on the western side, with a wooden ramp leading up to a solid wood door and large, wood frame, fixed picture window on the western façade and a large horizontal sliding glass window on the northern facade. The roof of the 1949 addition is slightly higher than the main structure, but echoes the gentle pitch of the roof, as well as its textured stucco cladding. The addition also has a shed style kitchen addition on the western end of its southern façade, with paneled wooden doors and fixed pane windows on the east and west ends. Refer to Photos 5 and 6 for views of the Shell House.

The ca. 1960 Trap House is located along the northern edge of the parking lot across from the trap field complex (Fields 1 to 3). The building's front faces north toward the trap field complex. Today, the building is primarily used as a classroom for hunter safety classes conducted by the PRGC (Gilligan, 2013). It is a wood-frame, single story structure with a rectangular footprint and side gable roof. The building sits on a concrete foundation that is higher on the northern façade in order to compensate for the ground slope leading towards Lake Merced. The exterior of the building is covered with plywood sheets and board and batten wooden siding under the gables. A full length recessed porch is located along the northern façade, and exposed eaves are present along the porch overhang. The porch fenestration includes metal double doors flanked by two metal frame casement windows. A secondary entrance is located on the eastern façade, along with two metal frame casement windows. Additional casement windows are located on the western and southern facades. Refer to Photos 8 and 9 for views of the Trap House.

The public restroom building is a small, rectangular-plan, wood-frame structure with a hip roof clad in asphalt shingles, wood siding, and a door at either end for the men's and women's restrooms. Refer to Photos 3 and 4 for images of this structure.

Buildings and Structures on the Eastern End of the Site (Caretaker's House, Clubhouse, Rifle Range Building, Barbeque Shed, Garage, and Metal Storage Containers)

Three club buildings—the Caretaker's House (ca. 1937), the Clubhouse (1937), and the Rifle Range Building (1939)—that house functions related to the operations of the PRGC facility and several small ancillary structures are located on the eastern end of the site.

The Caretaker's House is located in the narrow strip of land between the site's internal road and the bank of trees along the south side of the property, next to John Muir Drive. Although long used as the residence of the onsite caretaker, this building is currently unoccupied. It is a wood-frame, single story structure with a rectangular footprint and gable roof. It has Composite shingles cover the roof, and there are exposed eaves on the south façade. The exterior walls of the Caretaker's House are clad with horizontal wooden siding. Gable ends have fish scale shingles on the east side and vertical wood siding on the west side. The original wood frame, double hung windows are present on the south north, and west facades. An enclosed primary entrance is located on the west side, and a secondary entrance is located on the eastern façade, accessed by wooden stairs, on a shed style addition. Refer to Photos 33 and 36 for images of the Caretaker's House.

The Clubhouse, which has been used continuously for club meetings and social events since its construction in 1937, is located just east of the Caretaker's House. It is a wood-frame, raised single story structure with a rectangular footprint and cross gable roof. Composite shingles cover the roof, and there are exposed eaves on the north façade above the porch overhang. The exterior walls are covered with horizontal wood siding. A covered wooden wheelchair ramp leading up to an enclosed porch is situated on the north façade, and wooden beams on concrete blocks support the ramp and porch. The northern fenestration includes a wood door with an inset textured glass window; adjacent to a large fixed picture window; a smaller, jalousie window; and two casement windows with textured glass. On the eastern façade is a projecting porch with wood railings, fixed modern vinyl windows, and a small, wood framed addition on the south façade clad in T-111 siding. The addition appears to be used for storage, has no windows or exterior doors, and is covered by thin, vertical wooden siding. A smaller, secondary entrance is located on the western façade, and three small, shed style additions are located on the southwest corner of the building. The area under the raised building also appears to be used for storage, and is accessed via two flush wood doors on either side of the cinderblock fireplace/chimney on the eastern end of the northern façade. Refer to Photos 33 and 36 for images of the Clubhouse.

The Rifle Range building is located across from the entrance to the property in line with the row of skeet fields, with Fields 4 to 7 to the west and Fields 8 and 9 to the east. It has been used continuously since 1939 for indoor rifle range target practice. It is a wood-frame, raised single story structure with a rectangular footprint and gable roof with composite shingles. The exterior walls are covered with horizontal wood siding, similar to the nearby Clubhouse and Caretaker's House. There are exposed eaves on the northern-most building segment, and a string of wood frame, double hung, four-pane windows are located on the north, south, and west façades. The ground-level primary entrance is located on the southern façade, and the northern end is raised above the downward slope towards Lake Merced. The entrance fenestration includes a flush wooden door, paired fixed windows below the gable, and a wood frame, double hung, four-pane window. There are secondary entrances on both the eastern and western façade. There is a full length ground level addition on the northern façade with a shed style roof, exposed eaves, a flush wooden door, and a pair of picture windows. Refer to Photo 31 for an image of the Rifle Range building.

There are a number of small ancillary structures located on the eastern end of the site. The Barbeque Shed, a small, one-room structure with a shed roof and exterior plywood walls, is located immediately east of the Rifle Range building and within a stand of eucalyptus trees; it appears to have been constructed ca. 1970. A modern, three-bay garage is located near the entrance to the site, and three, modern, metal storage containers are located southeast of the Clubhouse. Refer to Photos 32, 34, and 35 for images of the garage, Barbeque Shed, and storage containers, respectively.

Trap Fields[20]

The trap field complex (Fields 1, 2, and 3) at the northwest corner of the site consists of three fields each of which is laid out in a formation that is standard to the American version of trap. They were constructed between 1950 and 1955. Each field includes a square trap house which is partially buried in the ground at the north end of the field. This structure contains the machinery (the trap) that oscillates and launches the targets. Refer to Photos 23 to 30 for images of the trap field complex and its features, described below.

There are five shooting positions, spaced three yards apart, arranged in a slightly curved line located 16 yards behind (south) of the trap house, on a concrete path. Concrete lanes run perpendicular back (south) from each station on the front curved path. Metal tags embedded in these concrete lanes provide yardage markers that measure the distance in yards from the trap house (from 17 to 27 yards). These yardage markers provide the "handicap" locations for the system used to allow individuals of varying skill ranges to compete against each other in competitive matches. For example, a more skilled individual shoots from one of the higher yardage markers, and a less skilled individual shoots from one of the lower yardage markers. Two additional curved concrete paths, parallel to and south of the front one, complete the path system in each trap field.

Other features that are common to each trap field are the scorer's stand, which consists of a metal frame with plywood over the top and on one side creating a box or enclosure for the scorer to sit, and a small box mounted on a post that houses the token boxes and wiring used to activate the trap.

[20] Several secondary sources provided information on the standard arrangement and construction of the trap fields (Migdalski, 1997: 7; Sapp, 2009, 17-18); additionally, club president Patrick Gilligan provided information on the names and functions of features within the field complex (Gilligan, 2013).

Skeet Fields[21]

To the west of the Rifle Range building are the four skeet fields that were built by PRGC in 1938 after the two original fields (1934) were flooded; these fields are numbered from west to east as Fields 4, 5, 6, and 7. Two additional skeet fields (Fields 8 and 9), which were built in 1953, are located to the east of the Rifle Range building. Each of these six fields is laid out in a formation that is standard to the American version of skeet, and the general description that is common to each field is provided below with any individual differences noted. Refer to Photos 17 to 22 and Photos 37 to 41 for images of the skeet field complex and its features, described below.

Concrete Semi-Circular Station Path: Each skeet field includes a concrete path in the form of a semi-circle that links the eight shooting stations. Shooting stations 1 to 7 are spaced equidistantly around the semi-circle; station 1 is located immediately in front of the high house (described in the next paragraph) on the left side of the semi-circle, with the following stations (2 to 7) located 26 feet-8 inches to the right of the previous one, ending with station 7 that is immediately in front of the low house (described in the next paragraph) on the right side of the field. Station 8 is located at the center of the straight baseline path midway between the high and low houses. Stations 2 to 6 are located on a concrete pad attached to the inner portion of the semi-circle. A yellow square is painted on the concrete to define the stations positions; however on Fields 8 and 9, the outline of the square has also been routed into the concrete. Refer to Photos 38 and 39 for representative images of the semi-circular path and station layout.

High and Low Houses: The two structures that house the machinery that launches the targets are known as the high house and the low house due to the comparative height of the launch from each. High houses launch the target 10 feet above the ground with a slightly upward angle. Low houses launch the target three feet above the ground with a more acute upward angle. The high and low houses are located at opposite ends of the field; the high house on the left side of the field directly behind station 1 and the low house on the right side directly behind station 7. These wood frame tower structures are square in plan with a flat roof, and are painted green with white trim. Each house has a small opening through which the target is launched; on the east side for the high house and on the west side on the low house. A door that provides access to the interior of the house allows loading and maintenance on the trap machinery; each high house has wooden steps that provide access to this entrance door. With the exception of the houses on Field 4 (which are entirely clad in wood siding), the exteriors of each house is clad in a combination of wood siding at the top and smooth stucco siding on the bottom. Due to the limited space at the east end of the site, Fields 8 and 9 share a combination high-low house. This structure has an opening for the low launch on its west side for Field 8, and one for the high launch on its east side for Field 9. Refer to Photos 12, 13, 37, 38, and 40 for images of the high and low houses.

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21 Several secondary sources provided information on the standard arrangement and construction of the skeet fields (Nichols, 1939/1947:12; 15; Sapp, 2009:59-60 and 79); additionally, club president Patrick Gilligan provided information on the names and functions of features within the field complex (Gilligan, 2013).

Target Crossing or Center Point Post: Located at each skeet field is a short post positioned 10 feet north of the station 8 which denotes the target crossing point; the trap machinery from both the high house and low house are calibrated to send the target in a path directly over this post. Refer to Photo 17 for an image of one of the target crossing posts.

Equipment Shed/Control House: Located at skeet fields 4-7 are equipment sheds or control houses. These small structures are square in plan with a pyramid-shaped roof; a door on the back (south side) provides access to the interior; and a window on the front (north side) provides a view of the field; a token box (used to activate the trap) has been added to one side of each structure. Fields 8 and 9 (built about 15 years after Fields 4 to 7) lack control houses; here the token box is simply mounted on a short post. These current structures either replaced or are modifications of the original control sheds that appear in historical photographs from 1938-38(see Historic Images 8 and 10). Although the exact date this change occurred is not known (they are shown in Historic Image 11 taken in the 1960s), they are located in the same location and have the same function within the context of the operation of the skeet fields as the earlier structures. The original structures were taller (similar in height to the High House and with a shed roof) so that the trap puller who was seated in the upper portion of the structure could "see out over the heads of the shooter, to keep score on dead and lost targets" (Nichols, 1939/1947: 12). Refer to Photo 14 for a typical image of one of the equipment sheds/control houses.

Safety Fences: Wooden safety fences are located between the fields and along the west end of Field 4. The east end of Field 7, the west end of Field 8, and the east end of Field 9 each lack fences. Safety fences are typical features where skeet fields are laid out in a row ("down the line") as is the case at PRGC. In addition to physically and visually separating the fields, the design features of the fences were intended—in an era before shooters wore ear protection—to dampen some of the sound between fields. The fences have boards attached to opposite sides of wood posts; the position of the boards on one side alternates or is staggered with the ones on the other side. According a skeet instruction book first published in 1939, when protective fences were first added to skeet fields "they were simply made in the form of flat board fences. The reverberating sound between two such board fences was most annoying . . . However some smart acoustics engineer solved this problem a year or so ago by making this protective fence of 'baffle' type. That is, the boards are nailed on both sides of the 2 x 4 frame – and the boards are staggered in their placement. The board on one side covering the space left open on the other side" (Nichols 1947: 15). Refer to Photos 11 and 40 for representative images of the safety fences.

Duck Tower: A ca. 1958 duck tower, consisting of a trap machine atop a metal-frame support structure, is located behind station 4 on Field 6. The 4-sided tower is approximately 40 feet tall and about 10 feet square at the base. A storage shed that provides access to the base of the trap machinery (for loading the targets) is located within the footprint of the base of the tower structure. Refer to Photos 10 and 18 for images of the duck tower.

Modifications for Trap Shooting: A portion of the interiors of Fields 4 to 7 are paved with concrete to provide lanes and yardage markers for trap shooting; the yardage markers are stamped into the concrete. This concrete paving and the trap houses located north of each field, similar in appearance and construction to those located at Fields 1 to 3, were added between the mid 1950s to the late 1960s as a way to expand the trap shooting facilities. Currently, Fields 4 to 7 are currently only used for skeet (Gilligan, 2013); however the trap machinery remains inside each trap house. Refer to Photos 15 and 16 for images of this modification to the interior of the skeet fields.

Modifications for Five Stand Game: Field 6 has been modified slightly to accommodate the 'Five Stand' game. Five wood-frame shooting stands are aligned in a row across the west end of the field. Two equipment sheds (square plan, with shed roof, painted green), which are used to store the additional trap machinery needed for the Five-Stand game, have been added to the field; one is behind (northwest) stations 2 and 3 and the other is behind (southwest) stations 5 and 6. A third equipment shed is located in the sloped area next to the lake, approximately 100 feet north of station 8. Based on a review of aerial photographs on GoogleEarth, these features were added within the past ten years. Refer to Photo 18 for an overview image of Field 6 that shows the location of the five-stand frames and one of the equipment sheds and to Photo 19 for the equipment shed located north of the field.

Modifications for Olympic/International Skeet: Two landing posts used to calibrate the target machinery for Field 7, which adapted for Olympic/International skeet in 2011 (Gentry Magazine, 2012:58), are located in the slope area north of the Rifle Range building. The Olympic or International version of skeet is shot on the same field as the American version but the order and speed of the targets are different. Refer to Photos 20 for an image of one of the two landing posts.

Small Scale Features

There are a number of small scale features related to the trap and skeet shooting activities located throughout the PRGC site; these include a fire hose located on the east end of the site (Photo 42); a pattern board used to practice shooting at a paper target located east of Field 9 (Photo 43); shotgun racks constructed of wood and painted green located next to benches, to the high houses on the skeet fields, and at the Shell House and Trap House (Photo 44); benches with wood slats and concrete, metal, or plastic bases located west of each field where individuals waiting to shoot and spectators sit (Photo 45); and signage providing directional and safety information (Photo 46).

The asphalt paved area between Shell House and the skeet fields 4-7 contains picnic tables, a flagpole, and a water fountain. The flagpole is a metal pole with a concrete base that was erected in 1953 to honor the club's first president Joe Springer. A dedication plaque is attached to the flagpole's base.[22] The metal water fountain near the entrance to

[22] The plaque reads: "Dedicated to Joseph Springer / Pacific Rod and Gun Club / President 1928-1932 / One of the Founders of Our Club / A Real American / True Friend of Sportsmen / Champion of Conservation / April 5, 1953."

Fields 4 and 5 is in the same location as a porcelain fountain dedicated in 1942 to honor member Bud French who died around 1939 (Springer, 1949: Part 5); it is not known when the current metal fountain was installed. Additionally, a large wooden sign commemorating the Merced Rancho is located just west of the Shell House's south end.[23] Refer to Photos 5, 6, and 7 for images of these small-scale features adjacent to the Shell House.

Each of the seven skeet fields (Fields 4 to 9) is dedicated to a member, and a small monument with a dedication plaque is located just north of station 8 on each field (Photos 46 and 47).

Vegetation Features

The areas around the fields and within the non-paved areas within each field are grass. The sloped area north of Fields 1 to 7 located between the edge of the field and the shoreline vegetation communities is dominated by ice plant. Refer to Photos 17, 18, and 21 for representative images of these vegetation features.

A planting strip with grass runs along the western edge of the 1938 skeet fields (Fields 4 to 7); from the 1940s until around the 1970s, this area was planted with ornamental shrubs as a way to create a decorative transitional area between the fields and the parking lot. See Historical Image 11 for a view from the 1960s. Refer to Photo 10 for an image of the planting strip as it looks today.

Trees on the site include some that were located on there in 1934 when the club arrived and some that were planted in relationship to the club's use of the site. A small group of trees (six eucalyptus and one Monterey cypress) in the area between the Rifle Range building and Field 8 and several large eucalyptus trees along the southern edge of the site in the vicinity of the Caretakers House and Clubhouse are what remains of a larger stand of trees that predate the club's usage of the site (see Historic Images 2 and 3). A short row of four Monterey pine trees east of the Clubhouse are the remains of a longer row that was planted in the mid-1930s to define edge of the site next to John Muir Drive (see Historic Images 3, 5, and 7). Two Monterey cypress were planted by the club to frame the entrance to the Rifle Range Building. Today, the tree on the west side of the entrance door remains in place, but the one on its east side has been cut and only a stump. Refer to Photos 31, 34, 35 for images of these trees.

Vegetation around the perimeter of the site includes shoreline vegetation (various species classified in the *SFPUC Watershed report* as wetland, willow riparian scrub, native and non-native scrub, and herbaceous [SFPUC, 2011: 85]), various native and non-native species scrub at its east end, ice plant that has been invaded with a variety of native and non-native scrub plants along the bank that stretches along the southern edge of the site

23 The sign reads: "On September 23, 1835 Don Jose Jesus Castro Governor of California granted the Merced Ranch of 2200 acres to Jose Galindo. This was the first grant of land in San Francisco. On May 12, 1837 Galindo sold it to Francisco de Haro and Francisco Guerro for 100 cows and $25."

(next to John Muir Drive). Refer to Photos 3 and 22 for representative images of this vegetation.

VII. EVALUATION

A. Summary of Federal, State, and Local Significance

The following provides an evaluation of the significance of the PRGC site as a cultural landscape based on NRHP and CRHR Criteria A/1-D/4. Additionally, the NRHP Criteria guide the evaluation of significance for San Francisco's list of locally designated City Landmarks and Historic Districts which are designated under San Francisco Planning Code Article 10 (San Francisco Planning Department, 2013:6). A discussion of integrity is also provided below.

NRHP/CRHR Criterion A/1

The PRGC site is associated with broad patterns of history related to recreation, including associations with the development of recreation in San Francisco and at Lake Merced, with the expansion of recreation in San Francisco by the WPA during the Depression, and with the development of sportsmen's clubs and skeet within the context of the early 20th century wildlife conservation movement. Each of these is described below.

Association with Recreation around Lake Merced

The development of the PRGC site is part of a broad pattern of history associated with the development of recreation in San Francisco. More specifically, the PRGC site is associated with the pattern of expansion of recreation around Lake Merced that occurred during the 1910s-1930s after the SVWC began selling its land within the lake's watershed and after the SFPUC purchased the lake in 1930. Three golf courses (San Francisco Club in 1915, the Olympic Club in 1918, and Harding Park in 1925) were developed adjacent to the lake during this period. The PRGC was granted a lease by the SFPUC for outdoor target shooting activities in 1934 and constructed two skeet fields at its present-day site on the shore of lake in that year. The SFPUC also expanded fishing and boating activities associated with the lake during this period. The initiating stocking of the lake with sports fish (black bass) occurred in the early 1930s, and the first boat concession was granted in 1938. However, the PRGC site does not appear to possess individual significance under NRHP/CRHR Criterion A/1 for this association. It was one of several recreational facilities that developed on and around the lake during this period. Additionally, there is nothing inherent in its physical features that necessarily expresses or illustrates this association. In summary, the PRGC site does not appear to be individually significant under NRHP/CRHR Criterion A/1 for its association with the expansion of recreation around Lake Merced that occurred during the 1910s-1930s.

Association with Expansion of Recreation in San Francisco by WPA

The development of the PRGC site is part of the broad pattern of history associated with the expansion of San Francisco's recreational facilities during the Depression through the funding and work provided by the WPA. Between 1935 and 1939, over $15 million in

WPA funding was spent on park and recreation projects in the city. This work resulted in the construction of a wide range of facilities including clubhouses, recreation centers, public restroom facilities, and playgrounds and expanded the types of recreational opportunities that were available in the city. The WPA was responsible for clearing the part of the site and grading the parking lot and skeet field area around Fields 4 to 7 at the PRGC in 1939 in preparation for the National Skeet Championships that were held at there in August of that year. However, PRGC site does not appear to possess individual significance under NRHP/CRHR Criterion A/1 for its association with the WPA or the expansion of San Francisco's recreational facilities during the Depression. It was one of many recreational facilities in San Francisco constructed at least in part with WPA funding and labor. Additionally the work done at the PRGC site in 1939 by the WPA involved clearing the site of brush and other vegetation and grading, and there is nothing inherent in the site's physical features that necessarily expresses or illustrates its association with the WPA. In summary, the PRGC site does not appear to possess individual significance under NRHP/CRHR Criterion A/1 for its association with the WPA and the expansion of San Francisco's recreational facilities during the Depression through the funding and work provided by the this agency.

Association with the Development of Sportsmen's Clubs and Skeet within the Context of the Early 20th Century Wildlife Conservation Movement

The PRGC appears eligible for listing on the NRHP and CRHR at the local level of significance under Criterion A/1 for its association with the broad pattern of history related to the increased popularity of sport hunting and with the interrelated development of skeet—during the period it evolved from a type of shooting practice into a competitive sport—that occurred during the decades preceding World War II within the context of the early 20th century wildlife conservation movement. The PRGC is important as an example of the type of sportsmen's gun club that formed in the 1920s and 1930s within the context of the democratization of hunting, illustrating the social experience connected with the conservation movement. Additionally, the PRGC is important as the oldest extant skeet facility in the Bay Area and as the only sportsmen's club in the Bay Area to retain its original pre-World War II grounds configuration, skeet field structures, and club buildings. Other clubs that remain in operation from this pre-World War II era do not have skeet fields or have moved to newer facilities and are no longer located at their pre-World War II sites. The period of significance for the PRGC's significance under Criterion A/1 appears to begin in 1934 when the club moved to the Lake Merced site and to end in 1941 with the United States' entry into World War II, which ended the club's initial period of development. Although the activities of the club remained unchanged after World War II, its post-war expansion period (1946-early 1960s) was more directly linked with other contexts, including the broad interest in outdoor recreation that occurred within the context of the nation's post-World War II prosperity and an increased interest in skeet that was a by-product of World War II training practices, than to the early 20th century conservation movement.

Wildlife conservation during the 1880s through about 1900 was driven by the private efforts of American sport hunters, who were generally from the elite or upper classes. These individuals sought to facilitate the conservation of disappearing habitat and game through the management of private reserves and led efforts to change game laws. Their activities and their influence on public opinion laid the ground work for a shift during the early 20th century to the responsibility of wildlife habitat and game species management being undertaken by the public sector. Theodore Roosevelt and his fellow Progressives are credited with campaigning for game laws and public preserves and thereby democratizing sports hunting during the early 20th century.

Sport hunting's popularity, which rose during the pre-World War II era, was facilitated by the increased access to public game reserves and the public protection of game species that resulted from this early 20th century movement. Broader changes in society, including the inclusion of sport hunting within popular culture, improved transportation provided by inexpensive cars, and more leisure time (as a result of evolving labor practices), also contributed to the widespread popularity of sports hunting during this period. World War II interrupted sports hunting due to the rationing of ammunition, and its popularity, built upon the pre-war establishment period, probably peaked in the 1940s and 1950s (Herman, 2005: 30) due to changes in societal attitudes and the rise of other recreational activities and outdoor sports after the war.

The formation of clubs like the PRGC provided a framework for a shared social experience within the context of sports hunting and its relationship to the wildlife conservation movement. Clubs like the PRGC which formed in the 1920s and 1930s tended to identify themselves with the wildlife conservation movement and used the term "sportsmen" to describe themselves. The clubs, whose members were sports hunters, supported wildlife conservation efforts. The PRGC established in 1928 by a group of San Francisco sportsmen was "born as a conservation organization" (Springer, 1949: Part One). During this pre-World War II era the club was instrumental in the passage of the 1931 state legislation to take striped bass off the commercial market and it led efforts to test and plant sport fish in Lake Merced in the 1930s which culminated with the first opening day on Lake Merced for sport fishing on July 1, 1939. The club also raised funds, through an annual shooting event, for the establishment of a Ducks Unlimited Project in Canada known as Lake San Francisco. Former club president L. N. Alkalay who led the Ducks Unlimited efforts claimed that this led to "many other sportsmen's groups throughout the United States sponsoring similar projects in their names" using this "procedural format established originally by the Pacific Rod and Gun Club (Alkalay, n.d.:C).

These clubs also expressed the democratization of hunting that occurred during the pre-World War II era. They utilized public lands and reserves, they included members who were working and middle class, and they had greater numbers of members and more modestly priced dues when compared to the exclusive and wealthy membership of the private preserves of the late 19th century. Many like the PRGC had skeet and trap facilities which provided members and the public a way to improve their sport hunting skills or to engage with this popular activity. Skeet, with which the PRGC most strongly identified prior to World War II, was developed in the 1920s by Massachusetts-based sports hunters, within the context of the increased popularity of sport hunting and its increased accessibility to a broad range of the population. Skeet occurs on a specific field arrangement that can be laid out within a relatively small land area and at a relatively low cost. As such, skeet provided a readily accessible means for hunters in urban and semi-urban locations to improve their shooting skills.

During this pre-World War II era, the PRGC was at the forefront of the development of skeet in the Bay Area, demonstrated by the lists of activities described the history presented in this report. Its prominence within the skeet shooting context is further demonstrated by the 1939 National Skeet Championships which were held at the club on August 8-12, 1939. This was an annual, nationwide event that brought together hundreds of the best sport shooters in the country and was considered the premier skeet shooting event. The 1939 National Championships at the PRGC are important because this was the first time this event was held on the west coast and indicates how the widely spread the game had become in the decade and a half after its invention. The location of the championships at the PRGC also reflected the club's level of participation within the skeet shooting establishment and the quality of its facilities during this era.

NRHP/CRHR Criterion B/2

The research conducted for this Cultural Landscape Evaluation Report did not reveal any associations with important individuals who made specific contributions to history, and the PRGC does not appear to possess individual significance under NRHP/CRHR Criterion B/2 (Persons) for its associations with important persons.[24]

NRHP/CRHR Criterion C/3

The PRGC site does not appear to possess individual significance under NRHP/CRHR Criterion C/3 for associations related to design or construction. The five skeet fields and three trap fields each individually meet the standard design or construction regulations for their respective sports and retain their essential individual features or components. However; each field is an individual common example of a skeet or trap field that lacks significance related to design or construction. Collectively, the target shooting range at the PRGC represents a vernacular example of the arrangement of skeet and trap fields

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[24] A letter from attorney David P. Cincotta (Jeffer Mangels Butler & Mitchell LLP) to Vince Courtney (President, San Francisco Public Utilities Commission), dated March 24, 2014, stated that "[n]otable as part of the history of PRGC is the only Olympian in the United States history who has medaled in five consecutive Olympics—the Trap and Skeet Shooter, Kim Rhode" (p. 2). However, the PR&GC does not appear to have significance in association with Kim Rhode under NRHP/CRHR Criterion B/2.

Rhode does not appear to have a direct connection to the PRGC; nor does the club appear to best represent her contributions to the sports of trap and skeet. Rhode lives in El Monte, California in southern California and trains there seven days a week (Harris et al., 2012; Pilon, 2012; ADI, 2014). According to the guidance in *National Register Bulletin 15,* significance under Criterion B requires that a property be owned or used by the person of significance and that it best represent this person's historic contributions (NPS, 2002:15).

Additionally, it is not possible at this time to fully assess Rhode's significance to trap and skeet since she is still actively competing in trap and skeet (ADI, 2014). Rhode (born in 1979) has stated that she plans to compete in the Rio de Janeiro Olympics in 2016 and beyond (Pilon, 2012; Harris et al., 2012). Properties associated with living persons are usually not eligible for inclusion. The guidance in *National Register Bulletin 15* directs that sufficient time must have elapsed to assess both the person's field of endeavor and his/her contribution to that field. Additionally, the person's active participation in the endeavor must be finished for this historic perspective to emerge (NPS, 2002:16).

adapted to the geographic limits of this site (a strip of land situated between the Lake Merced and a public road), does not appear to have been designed or built by a master designer, and lacks significance related to design or construction. The buildings on the site (the Clubhouse, the Caretaker's House, the Rifle Range building, the Shell House, and the Trap House) remain in their original locations and are important for the operational and social functions of the clubs; however they are all are common examples of vernacular buildings and lack significance related to design or construction.

NRHP/CRHR Criterion D/4

NRHP/CRHR Criterion D/4 commonly applies to properties that contain or are likely to contain information bearing on an important archaeological research question. The identification of archaeological resources was outside of the scope of this report. However, based on the information that was gathered during this report, it appears unlikely that the PRGC has the potential to yield archaeological information important in prehistory or history and so does not appear to be individually significant under NRHP/CRHR Criterion D/4.

B. Integrity

Integrity is the ability of a property to convey its significance. The evaluation of integrity is grounded in an understanding of a property's physical features and how they relate to its significance. Integrity is composed of seven components or aspects—location, design, materials, workmanship, setting, feeling, and association (NPS, 2002:44).

The PRGC cultural landscape appears to exhibit all seven aspects of integrity in relationship to its individual significance under NRHP/CRHR Criterion A/1 in association the development of sportsmen's clubs and skeet within the context of the early 20th century wildlife conservation movement. The arrangement of the site, the four 1938 skeet fields, and the buildings of the PRGC from the 1934-1941 era are still extant and are used as they were originally intended. Since 1941, the changes that have occurred have been within locations that had previously been used for skeet and trap activities during the 1934-1941 era, did not alter the facilities from that era, and were compatible with the continued use of the site as a sportsmen's club and outdoor target shooting range. These changes included the expansion of the skeet and trap fields (Fields 1, 2, 3, 8, and 9), the addition of a duck tower, the addition of a building related to the trap operations (the Trap House), the replacement of minor equipment related to these activities, and the addition of small utilitarian or support structures (the Barbeque Shed, the public restroom, a garage, and storage containers). There have been minor alterations to some of the original buildings (the Clubhouse, the Caretaker's House, the Rifle Range building, and the Shell House) from the 1934-1941 era, such as changes to the windows and doors, as well as some accessibility improvements. A discussion of the PRGC cultural landscape in relationship to the individual aspects of integrity is provided below.

Location

Location is the place where the historic property was constructed or the place where the historic event occurred. Often the relationship between the property and its location is important in understanding why the property was created or why something happened (NPS, 2002:44).

The PRGC has been located on a narrow strip of land (approximately 10 acres in size) that is situated between the shoreline of the South Lake of Lake Merced and John Muir Drive, just east of the intersection with Skyline Boulevard, since 1934 and retains its integrity of location.

Design

In a vernacular landscape, the evaluation of integrity is closely tied to land use and how the form, plan, and spatial organization of a property are affected by the conscious and unconscious decisions over time about where areas of land use, roadways, buildings and structures, and vegetation are located (NPS, 2002:44; NPS, 1999:22).

The design (or the arrangement of the site features) of the PRGC cultural landscape evolved over the course the period of significance (1934-1941) in relationship to the primary land use as an outdoor target shooting range and within the constraints of the long and narrow shape of the site, which is situated between the lake and a public road. The shape of the site, the need to set the shooting activities back from the road, and the need to provide a safety zone for the falling targets (a shotfall zone)[25] resulted in the linear arrangement of the skeet and trap fields along the edge of the site next to the lake. This land next to the lake was graded to create a level terrace for the fields. The Rifle Range Building, which housed an indoor shooting range, was also located in this band of land along the lakeside edge of the site. The broad, gently sloped interior portion of the site was used for internal circulation (a parking lot and an internal road) and also provided the needed separation between John Muir Drive and the shooting activities along the lake. Buildings related to the operations and social functions of the club were relegated to the edge of the site adjacent to John Muir Drive (the Clubhouse and the Caretaker’s House) or the southern edge of the fields (the Shell House).

The primary features from the period of significance (1934-1941) that contribute to the design of the PRCG cultural landscape and that remain in place include Fields 4 to 7 (constructed in 1938), the topographic modifications that created the broad terrace for the construction of these fields, the Clubhouse (1937), the Caretaker’s House (ca. 1937), the Rifle Range building (1939), and the Shell House (ca. 1939).

There have been a number of changes in materials, additions of new structures, or additions or replacement of small scale features to the field area since the end of the period of significance.

- The material for the path system on the four 1938 fields (Fields 4 to 7) was changed from dirt or wooden boards to concrete in the 1950s and 1960s.

[25] The portion of the shotfall area that extends out into Lake Merced is outside of the lease area for the PRGC and outside of the boundary of the PRGC cultural landscape

- Concrete, stamped with trap yardage markers, was added to the interiors of Fields 4 to 7 during the 1950s and 1960s. A trap house was added north of station 8 in each of these fields during the same period. These modifications allowed the fields to be used for trap shooting.

- The original control houses located behind station 4 on Fields 4 to 7 were modified or replaced (ca. 1940s-1960s) with the current structures which serve the same function as the original ones.

- The High and Low houses on Field 4 have been reclad or reconstructed in vertically-oriented wood siding.

- A duck tower was added behind station 4 on Field 6 around 1958; the club had a duck tower during the period of significance but at a different location on the site.

- Three new trap fields (Fields 1 to 3) were added to the western end of the field area between 1948 and 1955. Two new skeet fields (Fields 8 and 9) were added to the eastern end of the field area in 1953. Both additions occurred in areas where earlier but now nonexistent trap or skeet fields were present during the period of significance; temporary skeet fields were located in both of these locations during the 1939 National Championships, and a trap field was located in the vicinity of Field 8 in the 1930s-1940s.

- The Trap House, originally used to register trap shooters, was added at the new trap field complex around 1960.

- Small-scale features were added that (1) likely replaced similar features (i.e., (benches, shotgun racks, center point posts, and rifle pattern board), (2) related to new target shooting activities (i.e., five-stand equipment on Field 6, additional control structures for five-stand game on Field 6, and target posts related to Olympic Skeet), or (3) are tangentially related to site activities (i.e. token boxes, signage, the fire hose, memorial markers, etc.).

As noted above these changes are compatible with the historic use of the site as an outdoor target shooting range. Additionally, the four 1938 fields (Fields 4 to 7) retain their character-defining features (a level terrace with a linear arrangement of fields, the semi-circular path system for the skeet field, the high and low houses, and the safety fences).

Changes to the club buildings after the end of the period of significance include the following:

- Visible, exterior alterations to the Club House include replacement vinyl frame picture windows on the south and east elevations, the addition of a wood frame wheelchair ramp and shed roof overhang on the east elevation, a cinderblock fireplace/chimney on the east elevation, and a small, wood-frame addition at the southwest corner clad in T-111 siding. Despite these changes, the building retains a moderate-to-high level of integrity.

- The only visible, exterior alterations to the Caretaker's Cottage is a small, wood-frame, shed-roofed addition on the south elevation. This addition appears to have provided a secondary entrance/exit to the building, as well as an expanded bathroom. This addition was clad in horizontal wood siding and has a roof pitch similar in design to the rest of the cottage. Despite this change, the building retains a high level of integrity.
- The only visible, exterior alterations to the Rifle Range building is a small, wood frame, shed-roofed addition clad in plywood siding on the west elevation. This addition appears to be a storage shed. Despite this change, the building retains a high level of integrity.
- A lunch room was added to the west end of the Shell House in 1949. This compatible addition has a low-pitch gable roof with exposed eaves and textured stucco cladding similar in design to the original Shell House. Other visible, exterior alterations to the Shell House include a replacement aluminum frame sliding glass door, a newer wood frame deck and railing with a shed roof overhang on the west elevation. A small, plywood-clad shed addition on the east elevation serves as a storage closet.

Secondary features that were present on site during the period of significance but that do not contribute to the design or function of the site as an outdoor target shooting range or to its function as a sportsmen's club include (1) the parking lot on the western end of the site, (2) the internal road on the eastern end of the site, (3) the small stand of trees (six eucalyptus and one Monterey cypress) in the area between the Rifle Range building and Field 8 (the remains of a larger stand of trees that predate the club's usage of the site trees), (4) several large eucalyptus trees along the southern edge of the site in the vicinity of the Caretaker's House and Clubhouse (the remains of a larger stand of trees that predate the club's usage of the site trees), (5) four Monterey pine trees (the remains of a longer row that was planted in the mid-1930s to define edge of the site next to John Muir Drive), and (6) a large Monterey cypress tree located on the west side of the primary entrance to the Rifle Range building. In the case of the trees listed above, their presence reflects the common usage of these species (eucalyptus, Monterey cypress, and Monterey pine) in San Francisco during the first half of the 20th century rather than a specific relationship to the functioning of the site as an outdoor shooting range.

Secondary features that have been added since the end of the period of significance include (1) the current sign (unknown date), (2) the restroom building (ca. 1965), (3) the barbeque shed (ca. 1970), (4) the three-bay garage (ca. 2000), and (5) the metal storage containers (date unknown).

In summary, the PRGC appears to retain its integrity of design; it retains its four 1938 fields (Fields 4 to 7); each of these fields retains its character-defining features (a level terrace with a semi-circular path system, high and low houses, and safety fences); it retains the club buildings from the period of significance (the Club House, the Caretaker's House, the Rifle Range building, and the Shell House); the alterations, as described above, are generally compatible with use of the site as an outdoor target shooting range.

Materials and Workmanship

Materials are the physical elements that were combined during a particular period of time and in a particular pattern or configuration to form a historic property. The choice and combination of materials reveal the preferences of those who created the property and indicate the availability of particular types of materials and technologies. Workmanship is strongly linked to materials and provides evidence of the technology or aesthetic principles of a historic period, and reveals individual, local, regional, or national applications of both technological practices and aesthetic principles (NPS, 2002:45).

Wood and its associated workmanship were characteristic of the PRGC cultural landscape during its period of significance. Wood was used for the framing and siding materials for the club buildings (the Clubhouse, the Caretaker's House, the Rifle Range building, and the Shell House). Wood boards and posts were used for some of the character-defining features of Fields 4 to 7 (the safety fences, the high and low houses, the steps associated with the high houses, the original equipment sheds [no longer extant], and the boarding for the semi-circular path system [no longer extant]). The original rustic fencing, next to John Muir Drive, and the original rustic entrance sign [both non-extant) were constructed from tree limbs and trunks. The predominance of wood in the club buildings and in the components of the skeet fields provides a strong visual link and contributes to the feelings associated with the club's pre-World War II origins. Additionally, wood was used for features that were added after World War II. Some of this post-war construction utilized wood materials and workmanship that was similar to that used in the pre-war era (for example, the trap houses on Fields 1-7, the high and low houses and safety fences for Fields 8 and 9, and various small-scale features such as shotgun racks and benches). However, in some cases the post-war construction used plywood or prefabricated wood siding that differs in appearance and workmanship from the pre-World War II features (for example, the plywood siding used on the replacement control/equipment sheds on Fields 4 to 7, the plywood siding used on the Trap House, the prefabricated siding used in remodeling of the high and low houses on Field 4, and the plywood in various small-scale features such as the portable trap scorer's stands, equipment boxes, and signage).

The current duck tower dates from around 1958 has a tall metal frame support structure. Another duck tower, with a similar metal support structure, was present on the site during the period of significance, so the materials and workmanship associated with this structure appear to be compatible with the appearance of the site during the period of significance.

Non-contributing materials and their related workmanship (i.e., ones have been added after the end of the period of significance) include the following:

- Concrete in the semi-circular path system and the interiors of the 1938 fields (Fields 4 to 7), in the path systems for the trap and skeet fields added after the end of the period of significance (Fields 1, 2, 3, 8 and 9), and in the sidewalk between the parking lot and Fields 4 to 7;

- Metal found in the chain-link fencing, in the entrance sign, in the some of the benches, trash cans, etc., in the portable trap scorer's stands, equipment boxes, and stands at the three trap fields (the metal in the yardage markers on the trap field is a very minor addition), and in the replacement aluminum frame sliding glass door for the Shell House;
- Asphalt paving in the parking lot and along the internal road; and
- Plastic used in some of the benches and in the replacement vinyl frame picture windows in the Club House.

The vegetation materials on the site or around its perimeter do not contribute to its design as an outdoor target shooting range and are considered to be non-contributing materials. The large trees (described under the integrity of design) that were present during the period of significance are examples of species (eucalyptus, Monterey cypress, and Monterey pine) that were commonly planted in San Francisco during the first half of the 20th century; their presence at the PRGC site reflects this common usage rather than a specific relationship to the functioning of the site as an outdoor shooting range. Similarly, the grass located on or next to the fields does not contribute directly to the design of the site as an outdoor shooting range; its use was probably both practical (to keep sandy soil in place) and ornamental; however, it is not a requirement for a skeet or trap field.

In summary, although there have been losses to the materials/workmanship from the period of significance and the addition of new ones, the PRGC cultural landscape still retains its integrity of materials and workmanship through the predominant presence of wood in the character-defining features of the fields and club buildings.

Setting and Feeling

Setting is the physical environment of a historic property and refers to the character of the place or location in which the property played its historical role. Setting involves how, not just where, the property is situated and its relationship to surrounding features and open space. Guidance in National Register Bulletin 15 directs that setting should be examined both within the exact boundaries of the property and between the property and its surroundings (NPS, 2002:45). Feeling is a property's expression of the aesthetic or historic sense of a particular period of time. It results from the presence of physical features that, taken together, convey the PRGC cultural landscape's historic character (NPS, 2002:45).

During the period of significance (1934-1941) the setting for PRGC cultural landscape and the feelings associated it were of an outdoor target shooting range set within a largely undeveloped portion of the city along the shoreline of Lake Merced to the north and undeveloped property with a large stand of trees to the south. Today, the internal setting and feelings associated with the outdoor target shooting range remain. The lake-side setting and feeling associated with this setting remain unaltered, including the shooting activities set back from John Muir Drive by the open area that serves as the property's parking lot. The continued presence of wood materials for key components in the skeet fields and in the club buildings provides a strong visual link and contributes to the feelings and setting associated with the club's pre-World War II origins.

The addition of the multi-story Lakeside Apartments on the south side of the property represents an intrusion into the setting around the PRGC site and lessens the feelings of being in an undeveloped part of the city. However, given that the primary views for people using the fields are directed toward the lake (which remains unaltered), the PRGC cultural landscape continues to retain its integrity of setting and feeling.

Association

Association is the direct link between an important historic event or person and a historic property. A property retains association if it is the place where the event or activity occurred and is sufficiently intact to convey that relationship to an observer. Like feeling, association requires the presence of physical features that convey a property's historic character (NPS, 2002:45).

The PRGC cultural landscape was associated with skeet and trap shooting activities during its period of significance (1934-1941). Today, it retains the key physical features that were present during its period of significance, listed above under Design, and continues to be strongly identified and associated with these activities and with the PRGC. In summary, the PRGC cultural landscape retains its integrity of association.

C. Evaluation Summary

The PRGC appears eligible for listing on the NRHP and CRHR at the local level of significance under Criterion A/1 for its association with the broad pattern of history related to the increased popularity of sport hunting and with the interrelated development of skeet—during the period it evolved from a type of shooting practice into a competitive sport—that occurred during the decades preceding World War II within the context of the early 20th century wildlife conservation movement. The PRGC is important as an example of the type of sportsmen's gun club that formed in the 1920s and 1930s within the context of the democratization of hunting, illustrating the social experience connected with the conservation movement. Additionally, the PRGC is important as the oldest extant skeet facility in the Bay Area and as the only sportsmen's club in the Bay Area to retain its original pre-World War II grounds configuration, skeet field structures, and club buildings. Other clubs that remain in operation from this pre-World War II era do not have skeet fields or have moved to newer facilities and are no longer located at their pre-World War II sites. The period of significance for the PRGC's significance under Criterion A/1 appears to begin in 1934 when the club moved to the Lake Merced site and to end in 1941 with the United States' entry into World War II, which ended the club's initial period of development. Although the activities of the club remained unchanged after World War II, its post-war expansion period (1946-early 1960s) was more directly linked with other contexts, including the broad interest in outdoor recreation that occurred within the context of the nation's post-World War II prosperity and an increased interest in skeet that was a by-product of World War II training practices, than to the early 20th century conservation movement.

The arrangement of the site, the four skeet fields, and the buildings of the PRGC from the 1934-1941 era are still extant and are used as they were originally intended. Since 1941, the changes that have occurred to the occurred within locations that had previously been used for skeet and trap activities during the 1934-1941 era, did not alter the facilities from that era, and were compatible with the continued use of the site as a sportsmen's club and outdoor target shooting range. These changes included the expansion of the skeet and trap fields (Fields 1, 2, 3, 8, and 9), the addition of a duck tower, the addition of a building related to the trap operations (the Trap House), the replacement of minor equipment related to these activities, and the addition of small utilitarian or support structures (the Barbeque Shed, the public restroom, a garage, and storage containers). There have been minor alterations to some of the original buildings (the Clubhouse, the Caretaker's House, the Rifle Range building, and the Shell House) from the 1934-1941 era, such as changes to the windows and doors, as well as some accessibility improvements.

D. Contributing and Non-Contributing Features

The features that were added to the PRGC property during its period of significance (1934-1941) and which relate to its significance under NRHP/CRHR Criterion A/1, for its association with the broad pattern of history related to the increased popularity of sport hunting and the development of skeet within the context of the early 20th century wildlife conservation movement, were identified as contributing features to the PRGC cultural landscape.

Those features that (1) may have been present during the period of significance but were not associated with the pre-World War II design or function of the site as an outdoor target shooting range/sportsmen's club (for example, vegetation) or (2) were added to the property after the end of its period of significance in 1941 (although in some cases these are compatible with its pre-World War II design or function as an outdoor target shooting range/sportsmen's club) were identified as non-contributing features.

Contributing Features

The contributing features for the PRGC cultural landscape related to its significance under NRHP/CRHR Criterion A/1 for the period between 1934 and 1941 include the following:

- Fields 4 to 7 (1938) and their character-defining features:
    - a level terrace,
    - the linear arrangement of the fields,
    - the semi-circular path system of the skeet field (the form and dimensions, not the concrete materials),

- the high houses (wood frame tower structure, square in plan with a flat roof, clad in a combination of wood siding at the top and smooth stucco siding on the bottom, door that provides access to the interior to allow loading and maintenance on the trap machinery, wood steps that provide access to this entrance door, and a window on the east side that provides an opening through which the targets are launched),[26]

- the low houses (wood frame tower structure, square in plan with a flat roof, clad in a combination of wood siding at the top and smooth stucco siding on the bottom, door that provides access to the interior to allow loading and maintenance on the trap machinery, and a window on the west side that provides an opening through which the targets are launched),[27] and

- the safety fences(wood boards attached to opposite sides of the wood posts so that the position of the boards on one side alternates or is staggered with the ones on the other side);

• The buildings that house the operational and social functions of the club:

  - The Clubhouse (1937) and its character-defining features (wood-framed, raised single story structure with a rectangular footprint and cross gable roof, exposed eaves, and horizontal wood siding),

  - The Caretaker's House (ca. 1937) and its character-defining features (wood-framed, single story structure with a rectangular footprint and gable roof, exposed eaves, horizontal wooden siding, gable ends with fish scale shingles [east side] and thin vertical wooden siding [west side], and original wood frame, double hung windows on the south, north, and west facades, and fixed wood shutters and entry shed on north facade),

  - The Rifle Range building (1939) and its character-defining features (wood-framed, raised single story structure with a rectangular footprint and gable roof, exposed eaves, horizontal wood siding, wood frame, double hung, four-pane windows on the north, south, and west facades); and

  - The Shell House (ca. 1939, expanded in 1949) and its character-defining features (wood-frame, single story structure with a rectangular footprint and low pitch gable roof with exposed eaves, textured stucco cladding, raised porch, and a large, wood frame, fixed pane picture window on the western façade).

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[26] The high house on Field 4 has been remodeled since the end of the period of significance and is entirely clad in wood siding.

[27] The low house on Field 4 has been remodeled since the end of the period of significance and is entirely clad in wood siding

Non-Contributing Features

Non-contributing features include the following:

- Fields 1 to 3, their associated features, and the Trap House;
- Alterations to Fields 4 to 7 including the equipment shed behind station 4, the concrete paving, the target crossing point post positioned 10 feet north of station 8, and the trap houses (aligned with station 8) in the sloped area next to the lake;
- Modifications on Field 6 for the five-stand game (the five stand racks, equipment shed behind stations 2 and 3, the equipment shed behind stations 5 and 6, the equipment shed in the sloped area next to the lake);
- Duck Tower;
- Fields 8 and 9, used for skeet, and their associated features;
- The two landing posts used to calibrate the Olympic Skeet target machinery for Field 7 on the sloped area north of the field and the Rifle Range building; and
- The internal automobile circulations features (parking lot on the western end of the site and the internal road on the eastern end of the site) and concrete sidewalk between Fields 4 to 7 and the parking lot;
- Small structures including the Barbeque Shed, the public restroom, the three-bay garage, and the storage containers;
- Vegetation features; and
- Small scale features including the entrance sign, the flag pole and water fountain between the Shell House and the fields, site furnishings (benches, trash cans, picnic tables, lights, etc.), shotgun racks, token boxes, center point posts, trap portable scorer's stands, memorial field markers, the rifle pattern board, the fire hose, chain-link fencing, and the interpretive sign commemorating Rancho Merced (located adjacent to the Shell House).

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APPENDIX

Historical Images 1-17

Figure 1: Location of Cultural Landscape Features

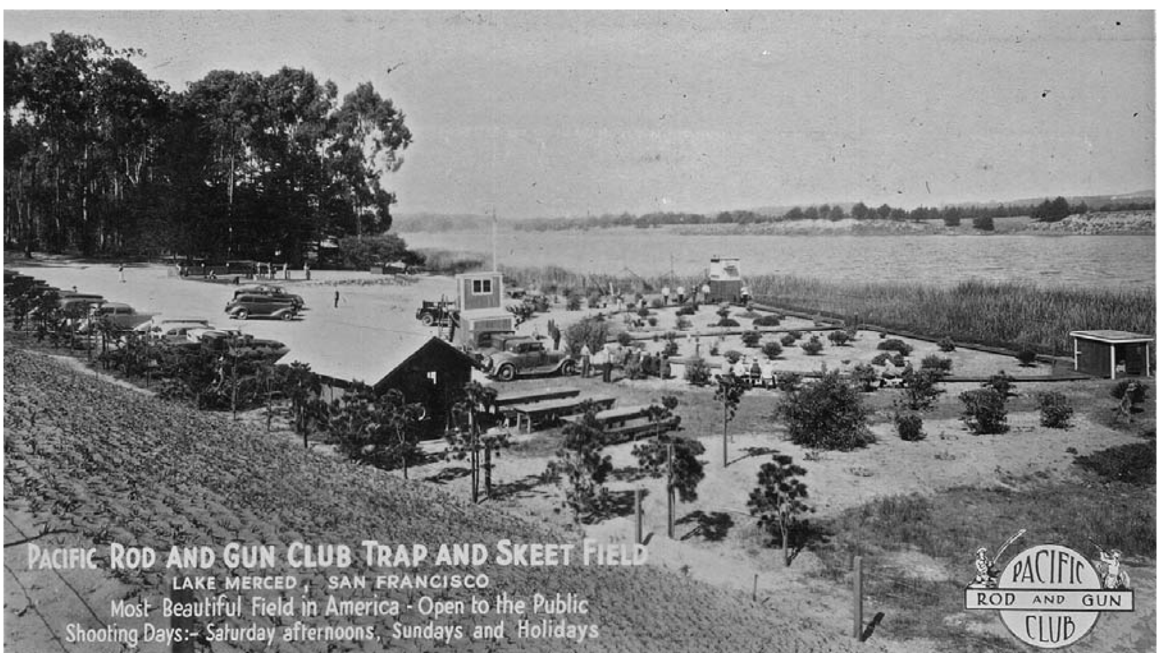
Figure 2: Location of Photographs

Photos 1-47

Historic Image 1. Undated photograph (ca. 1931-1934) of the skeet field located at Fort Funston that the PR&GC took over when it joined with the Bay Sportmen's Club in 1931.
Source: PR&GC Collection.

Historic Image 2. Aerial view of two original fields (ca. 1934). Note original entrance road prior to grading for John Muir Drive. Source: PR&GC Collection.

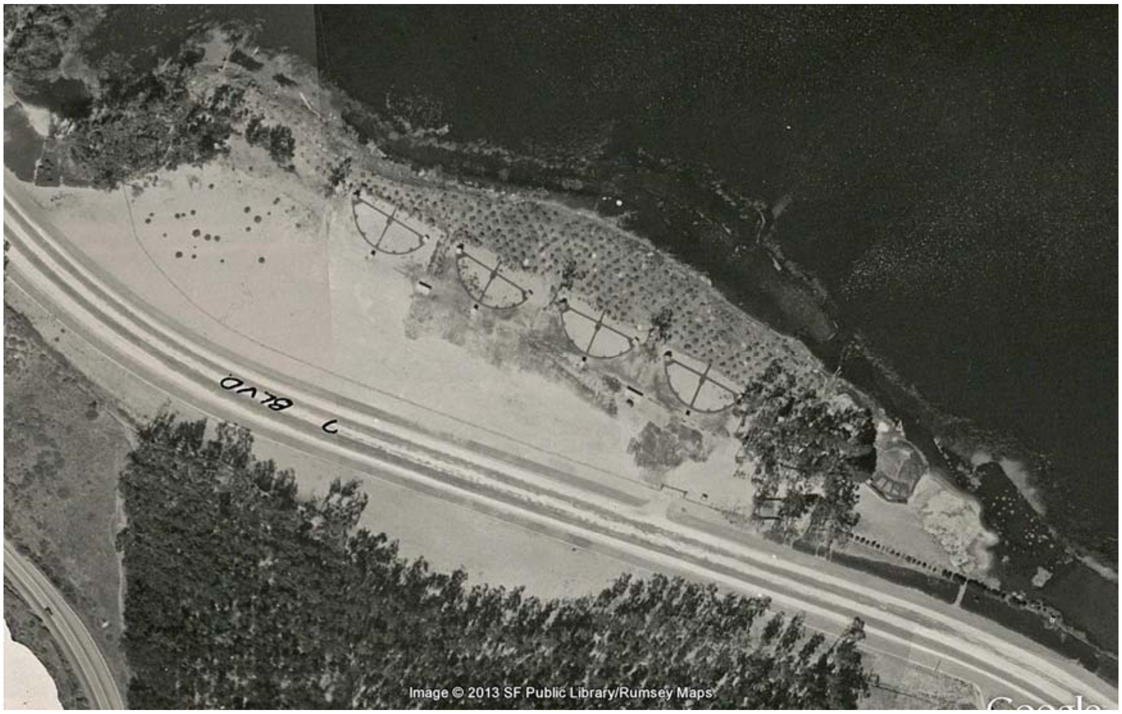
Historic Image 3. Aerial view in 1935 of the two original fields. Source: Pacific Aerial Surveys.



Historic Image 4. Eastern of the two original skeet fields (ca. 1934-1937). Note the presence of an early trap field behind (northwest) of the skeet field, the “Lunch Room” building and picnic facilities in the southeastern corner of the site, and the row of pine trees planted along the western edges of the site. Source: PR&GC Collection.

Historic Image 5. Eastern portion of site in the late 1930s after Clubhouse was added. Note the row of pine trees along western edge of property and an early duck tower visible through the stand of trees (see arrow). Source: PR&GC Collection.

Historic Image 6. View in 1937 showing one of original fields flooded after the lake rose. Source: PR&GC Collection.

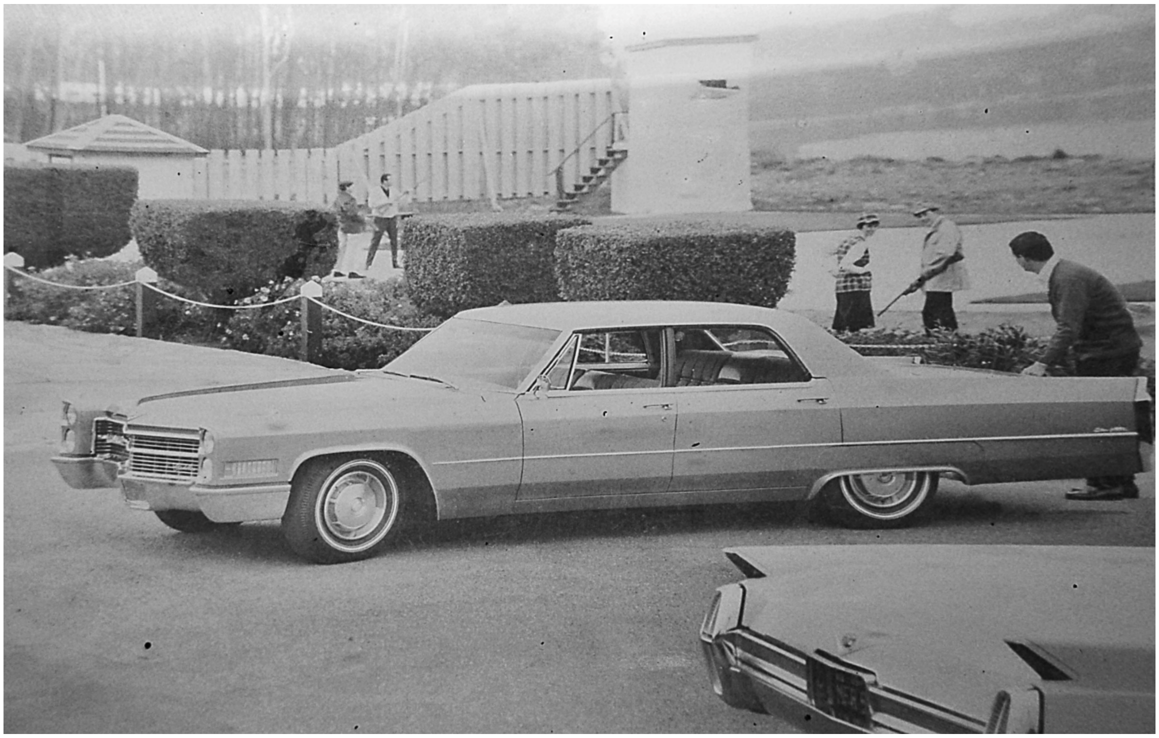


Historic Image 7. Aerial view in 1938 after western end of site cleared and the addition of new skeet fields (Fields 4 to 7) built by club members following abandonment of two original fields in 1937. Also note the presence of a trap field in the vicinity of present day Field 8. Source: GoogleEarth.

Historic Image 8. Western end of site after the addition of the new skeet fields (Fields 4 to 7) built by club members following flooding and abandonment of original fields in 1937. Photo likely dates from 1938 or 1939 prior to site work done by WPA in 1939 (to prepare the site for the National Skeet Championships held there on 8-12 August 1939) and before the addition of the Rifle Range Building. Also note the presence of a duck tower (see arrow). Source: PR&GC Collection.

Historic Image 9. Entrance sign to site (ca. late 1930s). Source: PR&GC Collection.

Historic Image 10. Overview of western portion of site and skeet fields (fields 4 to 7) after parking lot graded and sidewalk and planting strip added to western edge of field complex. Photo taken during a major tournament, probably the 1939 National Skeet Championship.
Source: PR&GC Collections.



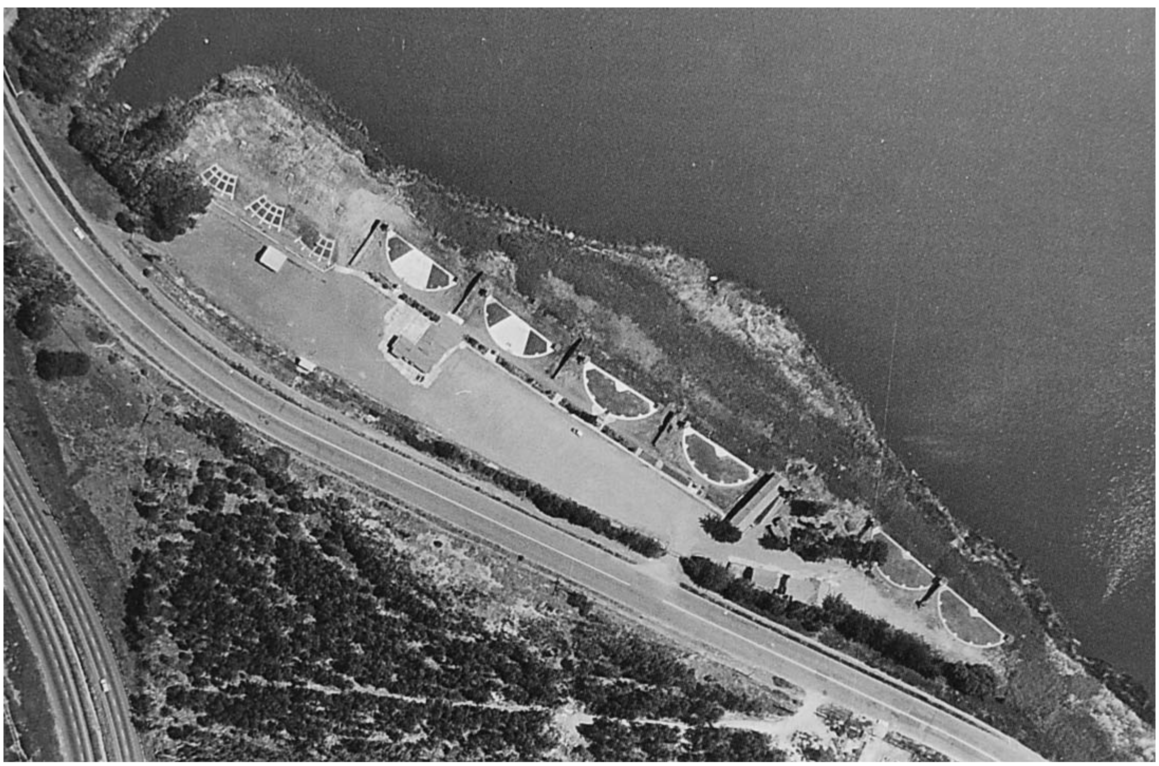
Historic Image 11. Skeet fields ca. 1960s. Source: PR&GC Collection.

Historic Image 12. Aerial view in 1948. Changes since 1938 aerial (Historic Image 7) include addition of Rifle Range and Shell house. Source: Pacific Aerial Surveys.

Historic Image 13. Aerial view in 1950. Changes since 1948 aerial (Historic Image 12) include grading and expansion of parking lot to western edge of site and addition of first trap field (Field 3). Source: Pacific Aerial Surveys.

Historic Image 14. Aerial view in 1955. Changes since 1950 aerial (Historic Image 13) include completion of trap field complex (Fields 1 to 3), addition of concrete skeet station path around Fields 4 to 7 on western end of site, and construction of skeet fields (Fields 8 and 9) at eastern end of site. Source: Pacific Aerial Surveys.

Historic Image 15. Aerial view in 1958. Changes since 1955 aerial (Historic Image 14) include addition of concrete trap yardage marker pavement to the interior of Fields 4 and 5 that allowed these fields to be used for both skeet and trap. Source: Pacific Aerial Surveys.



Historic Image 16. Aerial view in 1965. Changes since 1958 aerial (Historic Image 15) include addition Trap House and Restroom. Source: Cartwright Aerial Surveys Image, UC Berkeley Earth Sciences Map Room Collection.

Historic Image 17. Aerial view in 1969. Changes since 1965 aerial (Historic Image 16) include addition of concrete trap yardage marker pavement to the interior of Fields 6 and 7. Source: Pacific Aerial Surveys.

Figure 1: Location of Cultural Landscape Features (Source of Base Map: GoogleEarth)

Figure 2: Location of Photoraphs (Source of Base Map: GoogleEarth)

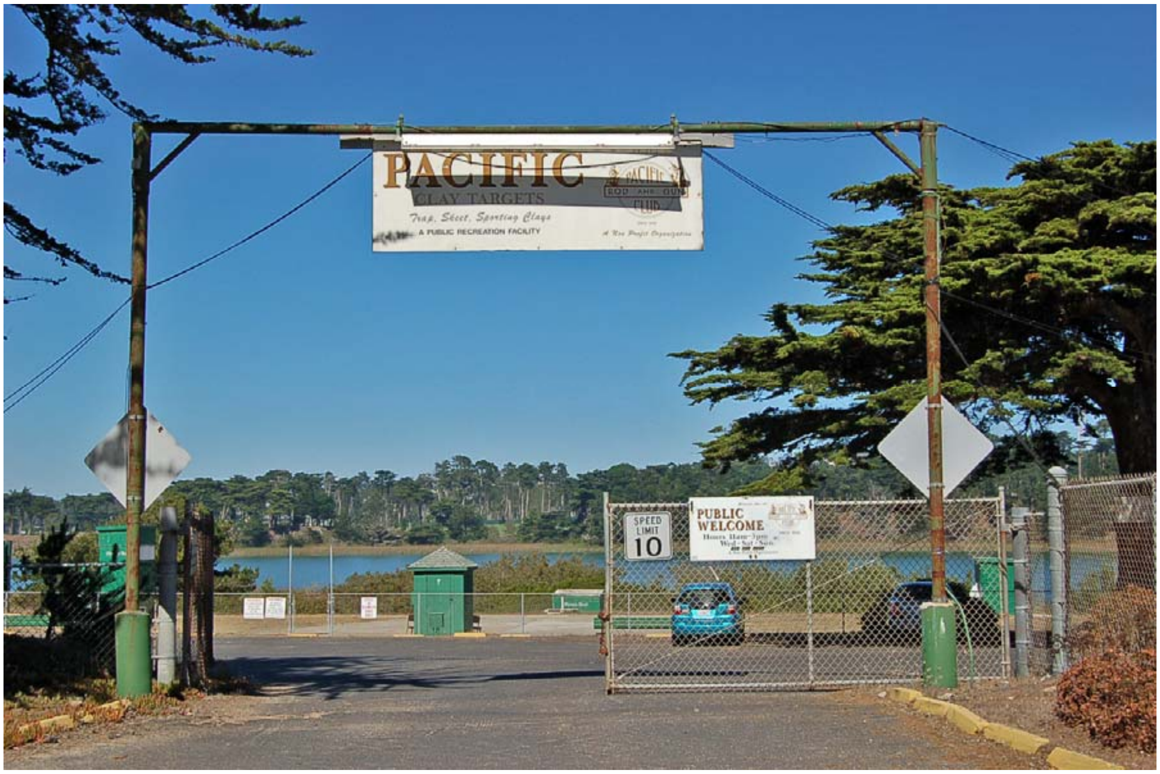


Photo 1. Entrance to Pacific Rod and Gun Club (D. Bradley, September 2013).

Photo 2. Parking lot; view toward skeet fields (D. Bradley, September 2013).

Photo 3. Parking lot showing the bank that extends along edge of lot; view toward John Muir Drive (D. Bradley, September 2013).

Photo 4. Restroom Building (ca. 1958-1965); view to SE (D. Bradley, September 2013).

Photo 5. Shell House (ca. 1939-1948) and sign commemorating Merced Rancho (to left); view to N (D. Bradley, September 2013).

Photo 6. Shell House, Springer memorial flag pole, picnic tables; view to S (D. Bradley, September 2013).

(a)


(b)


(c)

Photo 7. (a) Memorial plaque at the base of Springer memorial flag pole; (b) water fountain in front of Shell House; (c) picnic tables (D. Bradley, September 2013).

Photo 8. Trap House; view to N toward trap fields (D. Bradley, September 2013).

Photo 9. Trap House; view to S with trap fields in foreground (D. Bradley, September 2013).

Photo 10. Overview of skeet field complex; also showing sidewalk and remains of planting strip that run along the outer edge of field complex; view to NW (D. Bradley, September 2013).

Photo 11. Fence that separates Fields 6 and 7 (typical example of feature also found on Fields 4 to 7); view to NE (D. Bradley, September 2013).

Photo 12. High House on Field 7 (typical example of feature found on Fields 4 to 7); view to N (D. Bradley, September 2013).

Photo 13. Low House on Field 7 (typical example of feature found on Fields 4 to 7 and 9); view to NE (D. Bradley, September 2013).

Photo 14. Skeet equipment shed on Field 7 (typical example of feature found on Fields 4 to 7); view to S (D. Bradley, September 2013).

Photo 15. Paved area in the interior of skeet field that provides trap yardage markers (typical example of feature found on Fields 4 to 7 that allowed field to be used for trap as well as skeet) (D. Bradley, September 2013).

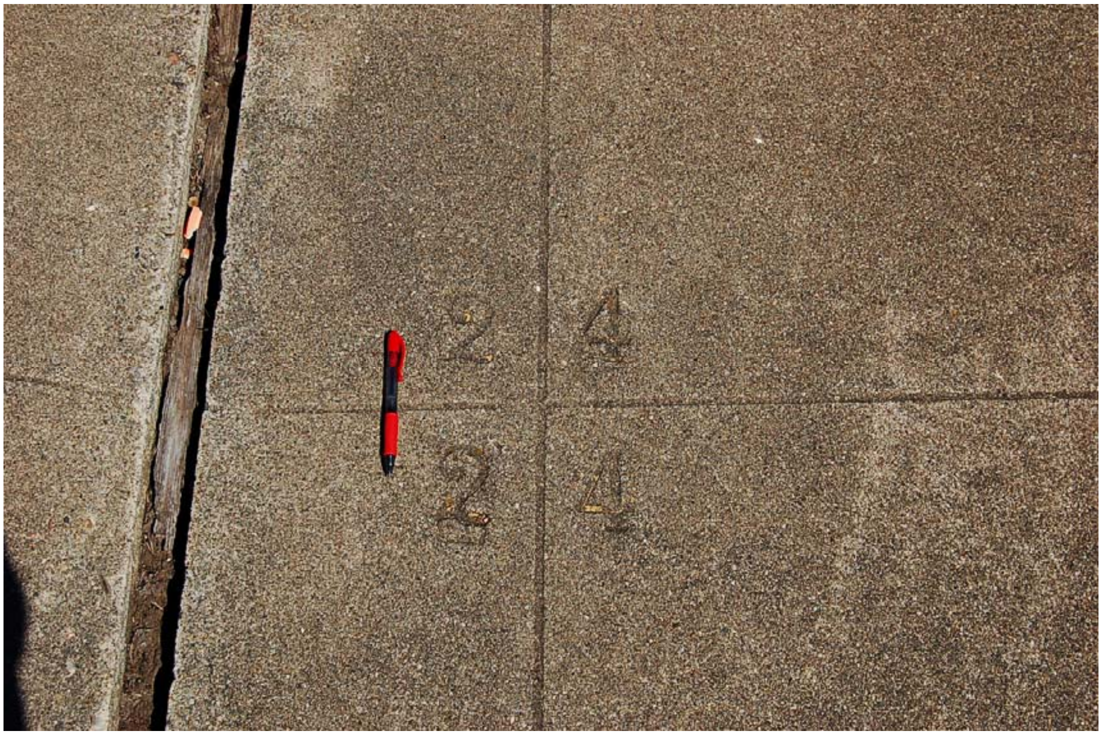


Photo 16. Detail of stamped distances for trap yardage markers found on the interior paved areas in Fields 4 to 7 (D. Bradley, September 2013).

Photo 17. Center point pole (used to calibrate skeet machinery) on Field 7 (typical example of feature found on Fields 4 to 7, 8, and 9). Note memorial plaque (foreground) (typical example of feature found on Fields 4 to 7, 8, and 9). Trap house (painted with "Olympic Skeet) behind center point pole is no longer used now that Field 7 is dedicated solely to skeet (typical example of feature found north of Fields 4 to 7) (D. Bradley, September 2013).

Photo 18. Duck Tower, Five Stand frames, and a Fire Stand equipment shed on Field 6; view to W (D. Bradley, September 2013)

Photo 19. Shed (for equipment used in Five Stand game) in outfield area north of Field 6; view to NE (D. Bradley, September 2013)

Photo 20. One of two landing posts (used to calibrate Olymic Skeet machinery for Field 7) located in the outfield area NE of Field 7 (D. Bradley, September 2013).

Photo 21. Overview of skeet field complex and outfield area sloping down to Lake Merced; view to W (Fields 7, 6, 5, and 4) (D. Bradley, September 2013).

Photo 22. Skeet field complex showing topographic modifications (level fields and slope toward lake) and vegetation along shoreline; view to SE (Fields 4 to 7) (D. Bradley, September 2013).

Photo 23. Overview of trap field complex; view to NW (Fields 3, 2, and 1) (D. Bradley, September 2013).

Photo 24. Detail of paved lane layout in trap field with embedded metal tag yardage markers (typical to Fields 1, 2, and 3) (D. Bradley, September 2013).

Photo 25. Detail of embedded metal tag yardage markers shown on the paved lane in Photo 24 (D. Bradley, September 2013).

Photo 26. Trap scorer's stand (typical to Fields 1, 2, and 3); view to W (D. Bradley, September 2013).

Photo 27. Equipment box in trap field complex (typical to Fields 1, 2, and 3) (D. Bradley, September 2013).

Photo 28. Station stands located at north end of trap field (typical to Fields 1, 2, and 3); view to NW (D. Bradley, September 2013).

Photo 29. Overview of north end of trap field complex showing topographic modifications (level fields and slope toward lake) and inset trap houses; view to W (Fields 3, 2, and 1) (D. Bradley, September 2013).

Photo 30. Trap house located at the north end of Field 3 (typical to Fields 1, 2, and 3); view to W (D. Bradley, September 2013).

Photo 31. Rifle Range building; entrance flanked on west side by a Monterey cypress (stump of corresponding tree remains on east side of entrance); view to NE (D. Bradley, September 2013).

Photo 32. Garage; view to SE (D. Bradley, September 2013).

Photo 33. Club House (left) and Caretakers house (right); view to S (D. Bradley, September 2013).

Photo 34. Stand of eucalyptus, BBQ shed, storage shed, and Rifle Range building: view to NW (D. Bradley, September 2013).

Photo 35. Overview of east end of site; Fields 8 and 9 (left) and storage container (right); view to SE (D. Bradley, September 2013).

Photo 36. Storage container; note trunks of remaining section of row of Monterey pine trees; view to W (D. Bradley, September 2013).

Photo 37. Overview of Field 8; view to E (toward Field 9) (D. Bradley, September 2013).

Photo 38. Overview of Field 9 showing typical layout of skeet field; view to E (D. Bradley, September 2013).

Photo 39. Detail of incised station layout on concrete path (typical to Fields 8 and 9) (D. Bradley, September 2013).

Photo 40. Fence dividing Fields 8 and 9 and combination High/Low House; view to NW (D. Bradley, September 2013).

Photo 41. Token box typical to Fields 8 and 9 (D. Bradley, September 2013).

Photo 42. Fire hose (D. Bradley, September 2013).

Photo 43. Pattern board located at east end of site; view to NE (D. Bradley, September 2013).

Photo 44. Typical examples of shotgun racks found throughout the site (D. Bradley, September 2013).

Photo 45. Typical examples of the various types of benches associated with skeet and trap fields (D. Bradley, September 2013).

(a)

(b)

(c)


(d)

Photo 46. (a) Typical example of signage; (b) Typical example of signage; (c) Herve memorial marker (n.d.) on Field 4; (d) Westwater memorial marker (n.d.) on Field 5 (D. Bradley, September 2013).

(a)

(b)

(c)

(d)

Photo 47. (a) Lotz memorial marker (1977) on Field 6; (b) Shappel memorial marker (n.d.) on Field 7; (c) Bulloch memorial marker (1992) on Field 8; (d) Schenley memorial marker (1955) on Field 9 (D. Bradley, September 2013).

APPENDIX B

Special-Status Species that May Occur at the Project Site

APPENDIX B
SPECIAL STATUS SPECIES THAT MAY OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	**Federal Status**	**State Status**	**CNPS Listing**	**Habitat Description / Blooming Period**	**Potential to Occur in the Action Area**
Plants					
Presidio manzanita *Arctostaphylos montana* ssp. *Ravenii*	FE	CE	1B.1	Open, rocky, serpentine slopes in chaparral, coastal scrub, and coastal prairie. February – March	**Low.** No suitable habitat present.
Marsh sandwort *Arenaria paludicola*	FE	CE	1B.1	Freshwater or brackish marshes and swamps. May – August	**Low.** Potentially suitable habitat present at Lake Merced, but species not observed there (May and Associates, 2009[1]; Nomad Ecology, 2011[2]; San Francisco Planning Department, 2011)[3]; species presumed extirpated in San Francisco.
Presidio clarkia *Clarkia franciscana*	FE	CE	1B.1	Serpentine outcrops in coastal scrub, and valley and foothill grassland. May – July	**Low.** No suitable habitat present.
Beach layia *Layia carnosa*	FE	CE	1B.1	Sand dunes. March – July	**Low**. Recorded generally from sand dunes in San Francisco in 1904; may be present in the seed bank.
San Francisco lessingia *Lessingia germanorum*	FE	CE	1B.1	Coastal scrub, sandy soils free of competing species. July – November	**Low.** Historically known from Lake Merced but not recently observed; may be present in the seed bank.
White rayed pentachaeta *Pentachaeta bellidiflora*	FE	CE	1B.1	Open, dry, rocky slopes and grassy areas, usually on serpentine. March – May	**Low.** No suitable habitat present.
Marin western flax *Hesperolinon congestum*	FE	CT	1B.1	Chaparral and grassland, usually on serpentine barrens. April – July	**Low.** No suitable habitat present.
Robust spineflower *Chorizanthe robusta var. robusta*	FE	--	1B.1	Sandy or gravelly coastal dunes, coastal scrub, cismontane woodland and maritime chaparral. April – September	**Low.** Potentially suitable habitat present at Lake Merced but species not observed there (San Francisco Planning Department, 2011; May and Associates, 2009; Nomad Ecology, 2011); species presumed extirpated in San Francisco.
San Bruno Mountain manzanita *Arctostaphylos imbricada*	--	CE	1B.1	Chaparral and coastal scrub, usually on sandstone outcrops. February – May	**Low.** No suitable habitat present.

1 May and Associates, *Draft Botanical Survey Report, Lake Merced Water Level Restoration Project*. Prepared for Winzler & Kelly, August 31, 2009.

2 Nomad Ecology, *Lake Merced Vegetation Mapping Update, Lake Merced Natural Area, City and County of San Francisco, California*, revised draft. Prepared for San Francisco Public Utilities Commission, May 2011.

3 San Francisco Planning Department, *Significant Natural Resource Areas Management Plan Draft Environmental Impact Report*, Planning Department Case No. 2005.1912E, State Clearinghouse No. 2009042102, August 2011.

Common Name *Scientific Name*	Federal Status	State Status	CNPS Listing	Habitat Description / Blooming Period	Potential to Occur in the Action Area
Plants (cont.)					
Pacific manzanita *Arctostaphylos pacifica*	--	CE	1B.1	Coastal scrub and chaparral. February – April	**Low.** No suitable habitat present.
San Francisco popcorn-flower *Plagiobothrys diffusus*	--	CE	1B.1	Coastal prairie, and valley and foothill grasslands. March – June	**Low.** No suitable habitat present.
Adobe sanicle *Sanicula maritima*	--	Rare	1B.1	Moist clay or ultramafic soil in chaparral, coastal prairie, meadows, seeps, and valley and foothill grassland. February – May	**Low.** No suitable habitat present.
Hairless popcorn-flower *Plagiobothrys glaber*	--	--	1A	Coastal salt marshes and alkaline meadows. March – May	**Low.** No suitable habitat present.
Franciscan manzanita *Arctostaphylos franciscana*	--	--	1B.1	Open, rocky, serpentine outcrops in chaparral. February – April	**Low.** No suitable habitat present. This species was believed to be extinct in the wild (although still extant through cultivation), but was rediscovered in Presidio National Park in late 2009.
Fragrant fritillary *Fritillaria liliacea*	--	--	1B.1	On clay, often serpentine derived soils in coastal scrub, grassland, and coastal prairie. February – April	**Low.** No suitable habitat present.
Blue coast gilia *Gilia capitata* spp. *chamissonis*	--	--	1B.1	Coastal dunes and scrub. April – July	**Moderate.** Historically present in suitable habitat around Lake Merced. Present on the northeastern shore of Impound Lake (Nomad, 2011)[4].
Kellogg's horkelia *Horkelia cuneata* ssp. *sericea*	--	--	1B.1	Coastal scrub, dunes, and openings of closed-cone coniferous forests. February – July	**Low.** Suitable habitat present; not historically known to Lake Merced (May and Associates, 2009)[5].
Rose leptosiphon *Leptosiphon rosaceus*	--	--	1B.1	Coastal bluff scrub. April – July	**Low.** No suitable habitat present.
Oregon polemonium *Polemonium carneum*	--	--	1B.1	Coastal prairie, coastal scrub, lower montane coniferous forest. April – September	**Low.** Potentially suitable habitat present at Lake Merced but species not observed there (May and Associates, 2009; Nomad Ecology, 2011; San Francisco Planning Department, 2011)[6].

4 Nomad Ecology, *Lake Merced Vegetation Mapping Update, Lake Merced Natural Area, City and County of San Francisco, California*, revised draft. Prepared for San Francisco Public Utilities Commission, May 2011.

5 May and Associates, *Draft Botanical Survey Report, Lake Merced Water Level Restoration Project*. Prepared for Winzler & Kelly, August 31, 2009.

6 San Francisco Planning Department, *Significant Natural Resource Areas Management Plan Draft Environmental Impact Report*, Planning Department Case No. 2005.1912E, State Clearinghouse No. 2009042102, August 2011.

Common Name *Scientific Name*	Federal Status	State Status	CNPS Listing	Habitat Description / Blooming Period	Potential to Occur in the Action Area
Plants (cont.)					
Bent-flowered fiddleneck *Amsinckia lunaris*	--	--	1B.2	Coastal bluff scrub, cismontane woodland, and valley and foothill grassland. March – June	**Low.** No suitable habitat present.
Montara manzanita *Arctostaphylos montaraensis*	--	--	1B.2	Slopes and ridges in chaparral and coastal scrub. January – March	**Low.** No suitable habitat present.
Alkali milk-vetch *Astragulus tener* var. *tener*	--	--	1B.2	Alkali flats, flooded grassland, playas and vernal pools. March – June	**Low.** No suitable habitat present; species presumed extirpated in San Francisco.
Pappose tarplant *Centromadia parryi* ssp. *parryi*	--	--	1B.2	Chaparral, coastal prairie, meadows, seeps, coastal salt marshes and swamps, and vernally mesic, often alkaline, valley and foothill grasslands. May – November	**Low.** No suitable habitat present.
Franciscan thistle *Cirsium andrewsii*	--	--	1B.2	Coastal bluff scrub, coastal prairie, coastal mesic scrub, and broadleaf upland forest; sometimes on serpentine. March – July	**Low.** Potentially suitable habitat present at Lake Merced but species not observed there (San Francisco Planning Department, 2011[7]; May and Associates, 2009[8]; Nomad, 2011[9])
San Francisco Bay spineflower *Chorizanthe cuspidata* var. *cuspidata*	--	--	1B.2	Coastal scrub, dunes and grassland. April – July	**Moderate.** Two populations documented in 1992 and 2011 within half a mile of the project site along the west side of John Muir Drive west of Impound Lake (CDFW 2013 and Nomad 2011). Another population is present southwest of the project area on the Fort Funston sand dunes. Historically present on the north shore of South Lake Merced (May and Associates, 2009).
Point Reyes bird's-beak *Chloropyron maritimum* ssp. *palustre*	--	--	1B.2	Coastal salt marshes and swamps. June – October	**Low.** No suitable habitat present.
Compact cobwebby thistle *Cirsium occidentale* var. *compactum*	--	--	1B.2	Coastal scrub, grassland, and dunes. April – June	**Low.** Formerly known from Lake Merced in the same gully as San Francisco gumplant, but not recently observed; may be present in the seedbank.

7 San Francisco Planning Department, *Significant Natural Resource Areas Management Plan Draft Environmental Impact Report*, Planning Department Case No. 2005.1912E, State Clearinghouse No. 2009042102, August 2011.

8 May and Associates, *Draft Botanical Survey Report, Lake Merced Water Level Restoration Project*. Prepared for Winzler & Kelly, August 31, 2009.

9 Nomad Ecology, *Lake Merced Vegetation Mapping Update, Lake Merced Natural Area, City and County of San Francisco, California*, revised draft. Prepared for San Francisco Public Utilities Commission, May 2011.

APPENDIX B (Continued)
SPECIAL STATUS SPECIES THAT MAY OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	Federal Status	State Status	CNPS Listing	Habitat Description / Blooming Period	Potential to Occur in the Action Area
Plants (cont.)					
Round-headed Chinese-houses *Collinsia corymbosa*	--	--	1B.2	Coastal dunes and coastal prairie. April – June	**Low.** No suitable habitat present; species has not been seen in San Francisco for more than 100 years.
San Francisco collinsia *Collinsia multicolor*	--	--	1B.2	On humus-covered soil derived from mudstone in closed-cone coniferous forest and coastal scrub. March – May	**Low.** Potentially suitable habitat present in coastal scrub at Lake Merced but species not documented to occur there (May and Associates, 2009[10]; Nomad, 2011[11]).
Dark-eyed gilia *Gilia millefoliata*	--	--	1B.2	Coastal dunes. April – July	**Low.** No suitable habitat present; species potentially extirpated in San Francisco.
San Francisco gumplant *Grindelia hirsutula* var. *maritime*	--	--	1B.2	On sandy or serpentine slopes of sea bluffs in coastal scrub, or valley and foothill grasslands. June – September	**Low.** Potentially suitable habitat present at Lake Merced but species not documented to occur there (San Francisco Planning Department, 2011[12], May and Associates, 2009; Nomad, 2011).
Diablo helianthella *Helianthella castanea*	--	--	1B.2	On rocky soils in broadleaf upland forest, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland. March – June	**Low.** No suitable habitat present.
White seaside tarplant *Hemizonia congesta* ssp. *congesta*	--	--	1B.2	Grassy valleys and hills, often on fallow fields in coastal scrub. April – November	**Low.** No suitable habitat present.
Short-leaved evax *Hesperevax sparsiflora* var. *brevifolia*	--	--	1B.2	Sandy bluffs and flats in coastal scrub and coastal dunes. March – June	**Low.** Potentially suitable habitat present at Lake Merced but species not observed there (May and Associates, 2009; Nomad, 2011; San Francisco Planning Department, 2011).
Arcuate bush mallow *Malacothamnus arcuatus*	--	--	1B.2	Gravelly alluvium in chaparral and cismontane woodland. April – September	**Low.** No suitable habitat present.
Marsh microseris *Microseris paludosa*	--	--	1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland. August – June	**Low.** Potentially suitable habitat present at Lake Merced but species not observed there (May and Associates, 2009; Nomad, 2011; San Francisco Planning Department, 2011).

10 May and Associates, *Draft Botanical Survey Report, Lake Merced Water Level Restoration Project*. Prepared for Winzler & Kelly, August 31, 2009.
11 Nomad Ecology, *Lake Merced Vegetation Mapping Update, Lake Merced Natural Area, City and County of San Francisco, California*, revised draft. Prepared for San Francisco Public Utilities Commission, May 2011.
12 San Francisco Planning Department, *Significant Natural Resource Areas Management Plan Draft Environmental Impact Report*, Planning Department Case No. 2005.1912E, State Clearinghouse No. 2009042102, August 2011.

APPENDIX B (Continued)
SPECIAL STATUS SPECIES THAT MAY OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	Federal Status	State Status	CNPS Listing	Habitat Description / Blooming Period	Potential to Occur in the Action Area
Plants (cont.)					
Choris's popcorn-flower *Plagiobothrys chorisianus* var. *chorisianus*	--	--	1B.2	Mesic sites in chaparral, coastal scrub, and coastal prairie. March – June	**Low.** Potentially suitable habitat present at Lake Merced but species not observed there (May and Associates, 2009; Nomad Ecology, 2011; San Francisco Planning Department, 2011).
San Francisco campion *Silene verecunda* ssp. *verecunda*	--	--	1B.2	Mudstone, shale, or serpentine substrates in coastal scrub, coastal prairie, chaparral and valley and foothill grassland. March – June	**Low.** No suitable habitat present.
Santa Cruz microseris *Stebbinsoseris decipiens*	--	--	1B.2	On sandstone, shale or serpentine derived seaward facing slopes in broadleaf upland forest, closed-cone coniferous forest, chaparral, coastal prairie, and coastal scrub. April – May	**Low.** No suitable habitat present.
Coastal triquetrella *Triquetrella californica*	--	--	1B.2	On soil in coastal bluff and coastal scrub.	**Low.** Potentially suitable habitat present at Lake Merced but species not observed there (May and Associates, 2009[13]; Nomad, 2011[14]; San Francisco Planning Department, 2011[15]).
San Francisco owl's clover *Triphysaria floribunda*	--	--	1B.2	Grasslands. April – June	**Low.** Though historically known from Lake Merced, this species has not been observed since 1907; may be present in the seed bank.
Bristly sedge *Carex comosa*	--	--	2.1	Lake margins, marshes, swamps, coastal prairie, and valley and foothill grasslands. May – September	**Low.** Potentially suitable habitat present at Lake Merced but species not observed there (San Francisco Planning Department, 2011; May and Associates, 2009; Nomad, 2011)
San Francisco gumplant *Grindelia hirsutula* var. *maritima*	--	--	3.2	Coastal scrub and grasslands. June – September	**Low.** Formerly known from Lake Merced but not recently observed and not easily overlooked; may be present in the seedbank.
San Francisco wallflower *Erysimum franciscanum*	--	--	4	Coastal scrub and grassland, often on serpentine soils. March – June	**Moderate.** Occurs on northeastern slope of Impound Lake; suitable habitat is present at the project site (Nomad, 2011).
Dune tansy *Tanacetum camphoratum*	--	--	LS	Coastal dunes and clearings in dune scrub. July – October	**Moderate.** Occurs on the southwestern shore of South Lake; suitable habitat is present at the project site (Nomad, 2011).

13 May and Associates, *Draft Botanical Survey Report, Lake Merced Water Level Restoration Project*. Prepared for Winzler & Kelly, August 31, 2009.

14 Nomad Ecology, *Lake Merced Vegetation Mapping Update, Lake Merced Natural Area, City and County of San Francisco, California*, revised draft. Prepared for San Francisco Public Utilities Commission, May 2011.

15 San Francisco Planning Department, *Significant Natural Resource Areas Management Plan Draft Environmental Impact Report*, Planning Department Case No. 2005.1912E, State Clearinghouse No. 2009042102, August 2011.

APPENDIX B (Continued)
SPECIAL STATUS SPECIES THAT MAY OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	**Federal Status**	**State Status**	**CNPS Listing**	**Habitat Description / Blooming Period**	**Potential to Occur in the Action Area**
Plants (cont.)					
Coastal black gooseberry *Ribes divaricatum*	--	--	LS	Moist coastal understories; streamside thickets. March – May	**Low.** Occurs along southeastern slopes of Impound Lake; suitable habitat is present at the project site (Nomad, 2011).
California pipevine *Aristolochia californica*	--	--	LS	Chaparral and mixed evergreen forests on streambanks. January – April	**Low.** Occurs on the north side of East Lake (Nomad, 2011).
Wight's paintbrush *Castilleja wightii*	--	--	LS	Northern coastal scrub. March – August	**Low.** Occurs on the east side of Impound Lake (Nomad, 2011) [16].
Vancouver wild rye *Eleymus x vancouverensis*	--	--	LS	Coastal strand.	**Low.** Occurs on the north side of East Lake (Nomad, 2011).
Wild cucumber *Marah oreganus*	--	--	LS	Mixed evergreen forest. March – June	**Low.** Occurs on the northwest side of the Mesa in California blackberry scrub (SFPRD, 2006)[17].
Canyon live oak *Quercus chrysolepis*	--	--	LS	Chaparral and valley grasslands. May – June	**Low.** Occurs on the south side of East Lake; not known to South Lake (Nomad, 2011).
Thimbleberry *Rubus parviflorus*	--	--	LS	Closed cone pine forest and riparian wetlands. March – May	**Low.** Occurs on the south shore of East Lake (Nomad, 2011).
Invertebrates					
San Bruno elfin butterfly *Callophrys mossii bayensis*	FE	--	--	Coastal scrub on rocky outcrops with broadleaf stonecrop (*Sedum spathulifolium*)	**Low.** No suitable habitat present. Three known populations at San Bruno Mountain, Montara, and Pacifica.
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT	--	--	Serpentine grasslands.	**Low.** No suitable habitat present.
Mission blue butterfly *Plebejus icarioides missionensis*	FE	--	--	Grassland with *Lupinus albifrons, L. Formosa*, and *L. varicolor.*	**Low.** No suitable habitat present.
Callippe silverspot butterfly *Speyeria callippe callippe*	FE	--	--	Found in native grasslands with *Viola pedunculata* as larval food plant.	**Low.** No suitable habitat present.
Monarch butterfly *Danaus plexippus*	--	*	--	Eucalyptus groves (wintering sites).	**Low.** Several records of this species in Golden Gate Park but no wintering sites known at or adjacent to the project site.

16 Nomad Ecology, *Lake Merced Vegetation Mapping Update, Lake Merced Natural Area, City and County of San Francisco, California*, revised draft. Prepared for San Francisco Public Utilities Commission, May 2011.

17 San Francisco Recreation and Park Department (SFRPD), *Significant Natural Resource Areas – Final Draft*, February 2006.

APPENDIX B (Continued)
SPECIAL STATUS SPECIES THAT MAY OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	Federal Status	State Status	CNPS Listing	Habitat Description / Blooming Period	Potential to Occur in the Action Area
Invertebrates (cont.)					
Tomales isopod *Caecuditea tomalensis*	--	--	--	Still-to slow-moving water in vegetated ponds, preferably spring-fed.	**Absent.** Collected in 1984 from the waters of Lake Merced, but SFSU information indicates this species is no longer present (Holzman, 2005)[18].
Reptiles					
Western pond turtle *Emys marmorata*	--	CSC	--	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites and suitable upland habitat for egg-laying. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks.	**Present.** This species is known to Lake Merced. Basking habitat is present in riprap, matted bulrush, abandoned piers, and wood debris; limited upland breeding habitat has been noted.
San Francisco garter snake *Thamnophis sirtalis tetrataenia*	FE	SE	--	Densely vegetated ponds near open hillsides with abundant small mammal burrows.	**Absent.** No record of this species occurring at Lake Merced and is considered likely extirpated from San Francisco.
Amphibians					
California red-legged frog *Rana aurora draytonii*	FT	CSC	--	Freshwater ponds and slow streams with emergent vegetation for egg attachment.	**Low.** Historically present where habitat exists in the project vicinity including several recent CNDDB records in Golden Gate Park; however this species is considered extirpated from Lake Merced (Jones and Stokes, 2007)[19].
Birds					
California clapper rail *Rallus longirostris obsoletus*	FE	CE	--	Salt marsh wetlands along the San Francisco Bay.	**Low.** No suitable habitat present.
Bank swallow *Riparia riparia* (nesting)	--	CT	--	Vertical banks and cliffs with sandy soil, near water. Nests in holes dug in cliffs and river banks.	**Moderate.** Nests at Fort Funston and forages over Lake Merced. Likely a transient presence adjacent the project site.
Yellow warbler *Dendroica petechia brewsteri*	--	CSC	--	Nests in dense riparian cover and montane chaparral. Breeding distribution includes the coast ranges and western slopes of the Sierra Nevada. Rare to uncommon in lowland areas.	**Present.** Breeds at Lake Merced.
California black rail *Laterallus jamaicensis coturniculus*	--	CT	--	Salt and brackish marshes; also in freshwater marshes at low elevations.	**Low.** Historically known from Lake Merced but not recently observed.
Salt marsh common yellowthroat *Geothlypis trichas sinuous*	--	CSC	--	Forages in various marsh, riparian and upland habitats. Nests on or near the ground in concealed locations.	**Present.** This species is known to breed in the freshwater marshes at Lake Merced.

18 Holzman, Barbara A., Ph.D. 2005. Editor. *The Biogeography of Lake Merced.* Available online at http://bss.sfsu.edu/holzman/LakeMerced. Accessed April 1, 2009.
19 Jones and Stokes, *Probable Absence of California Red-Legged Frog from Lake Merced*, Oakland, CA, 2007.

APPENDIX B (Continued)
SPECIAL STATUS SPECIES THAT MAY OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	Federal Status	State Status	CNPS Listing	Habitat Description / Blooming Period	Potential to Occur in the Action Area
Birds (cont.)					
Alameda song sparrow *Melospiza melodia pusillula*	--	CSC	--	Salt marshes of eastern and south San Francisco Bay.	**Low.** No suitable habitat present.
San Pablo song sparrow *Melospiza melodia samuelis*	--	CSC	--	Salt marshes of eastern and north San Francisco Bay.	**Low.** No suitable habitat present.
Double-crested cormorant *Phalacrocorax auritus*	--	WL, 3503.5	--	Coastal areas and inland lakes in fresh, saline, and estuarine waters.	**Present.** Large nesting colonies are present at Lake Merced. Known to nest on the west side of South Lake near the San Francisco Police Department Firing Range which is located northwest of the project site.
Cooper's hawk *Accipiter cooperii*	--	3503.5	--	Nests in riparian areas and oak woodlands, forages at woodland edges.	**Present.** Foraging is known at Lake Merced, though breeding remains undocumented. Large trees in the project area, including eucalyptus and Monterey cypress, could support nests for this species.
Sharp-shinned hawk *Accipiter striatus*	--	3503.5	--	Nests in riparian areas and oak woodlands, forages in open areas	**Present.** Large trees in the project area, including eucalyptus and Monterey cypress, could support nests for this species.
Clark's grebe *Aechmophorus clarkia*	--	3503.5	--	Marine subtidal and estuarine waters; large lakes near coast and inland at low elevations.	**Present.** Breeds at Lake Merced.
Gadwall *Anas strepera*	--	3503.5	--	Interior valleys, wetlands, ponds and streams.	**Present.** Historically bred within San Francisco; now a winter resident at Lake Merced.
Great horned owl *Bubo virginianus*	--	3503.5	--	Riparian, coniferous, chaparral and desert habitats.	**Present.** Large trees in the project area, including eucalyptus and Monterey cypress, could support nests for this species.
Red-tailed hawk *Buteo jamaicensis*	--	3503.5	--	Found in nearly all habitats and elevations.	**Present.** Large trees in the project area, including eucalyptus and Monterey cypress, could support nests for this species.
Red-shouldered hawk *Buteo lineatus*	--	3503.5	--	Riparian woodlands with swamps and emergent wetlands.	**Present.** Large trees in the project area, including eucalyptus and Monterey cypress, could support nests for this species.
American kestrel *Falco sparverius*	--	3503.5	--	Frequents generally open grasslands, pastures, and fields; primarily a cavity nester.	**Present.** Large trees in the project area, including eucalyptus and Monterey cypress, and excavations in telephone poles could support nests for this species.
Osprey *Pandion haliaetus*	--	3503.5	--	Habitat varies greatly and usually includes adequate supply of accessible fish, shallow waters, open and elevated nest sites (10-60 feet in height), and artificial structures such as towers. Builds large platform stick nests near or in open waters such as lakes, estuaries, bays, reservoirs, and within the surf zone.	**Present.** Occurs at Lake Merced.

APPENDIX B (Continued)
SPECIAL STATUS SPECIES THAT MAY OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	**Federal Status**	**State Status**	**CNPS Listing**	**Habitat Description / Blooming Period**	**Potential to Occur in the Action Area**
Birds (cont.)					
Great blue heron *Ardea herodias*	--	3503.5	--	Shallow estuaries and fresh and saline emergent wetlands.	**Present.** Breeds at Lake Merced.
Green heron *Butorides striatus*	--	3503.5	--	Valley foothill and desert riparian habitats; freshwater emergent wetlands, lacustrine and riverine areas.	**Present.** Occurs at Lake Merced.
California quail *Callipepla californica*	--	3503.5	--	Shrub, scrub, brush, grasslands, open coniferous and deciduous habitats.	**Present.** Reintroduced to Harding Park in 2009.
Marsh wren *Cistothorus palustris*	--	3503.5	--	Creates a domed nest of grasses and sedges suspended in dense tulle vegetation. Forages in shrubs near marshes.	**Present.** Breeds at Lake Merced.
American goldfinch *Carduelis tristis*	--	3503.5	--	Cismontane foothills; riparian and cropland habitats.	**Present.** Breeds at Lake Merced.
Purple finch *Carpodacus purpureus*	--	3503.5	--	Coastal foothills and lowlands; riparian and coniferous habitats.	**Present.** Breeds at Lake Merced.
Olive-sided flycatcher *Contopus cooperi*	--	3503.5	--	Forest and woodland habitats.	**Present.** Breeds at Lake Merced.
Barn swallow *Hirundo rustica*	--	3503.5	--	Open areas from coastal grassland and shrubland to mixed coniferous forests.	**Present.** Breeds at Lake Merced.
Cliff swallow *Hirundo pyrrhonota*	--	3503.5	--	Traditionally build nests on vertical cliff faces however have adapted to man-made structures in urban environments including buildings, bridges, culverts, and overpasses where swallows build their mud nests on vertical walls in groups or colonies.	**Present.** Colonies have nested under bridge between South Lake and Impound Lake and adjacent to the project area.
Hooded oriole *Icterus cucullatus*	--	3503.5	--	Lower elevation riparian areas, palm oases, urban and cropland areas.	**Present.** Breeds at Lake Merced.
Red crossbill *Loxia curvirostra*	--	3503.5	--	Coniferous forests.	**Present.** Winter resident at Lake Merced.
Black-crowned night heron *Nycticorax nycticorax*	--	3503.5	--	Lowland and foothill areas. Nests in dense emergent wetlands and dense-foliaged trees.	**Moderate.** Locally uncommon; may breed at Lake Merced.
Pied-billed grebe *Podilymbus podiceps*	--	3503.5	--	Lacustrine habitats and freshwater emergent wetlands.	**Present.** Breeds at Lake Merced.
Sora *Porzana carolina*	--	3503.5	--	Fresh and saline emergent wetlands.	**Present.** Occurs at Lake Merced.

APPENDIX B (Continued)
SPECIAL STATUS SPECIES THAT MAY OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	**Federal Status**	**State Status**	**CNPS Listing**	**Habitat Description / Blooming Period**	**Potential to Occur in the Action Area**
Birds (cont.)					
Virginia rail *Rallus limicola*	--	3503.5	--	Fresh and saline emergent wetlands.	**Present.** Occurs at Lake Merced.
Red-breasted nuthatch *Sitta canadensis*	--	3503.5	--	Coniferous forests.	**Present.** Winter resident at Lake Merced.
Pygmy nuthatch *Sitta pygmaea*	--	3503.5	--	Coniferous forests and pinyon-juniper habitats.	**Present.** Occurs at Lake Merced.
Bewick's wren *Thyromanes bewickii*	--	3503.5	--	Chaparral; also pinyon-juniper woodlands.	**Present.** Breeds at Lake Merced.
Barn owl *Tyto alba*	--	3503.5	--	Open areas including chaparral, grassland, riparian, wetlands.	**Present.** Occurs at Lake Merced.
Orange-crowned warbler *Vermivora celata*	--	3503.5	--	Chaparral, coastal scrub, foothill riparian.	**Present.** Occurs at Lake Merced; suspected to breed here also.
Wilson's warbler *Wilsonia pusilla*	--	3503.5	--	Foothill riparian areas, thickets.	**Present.** Breeds at Lake Merced.
Mammals					
western red bat *Lasiurus blossevillii*	--	CSC	--	Roosts primarily in trees, 2-40 feet above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	**Moderate.** Roosting habitat is available in tree/shrub foliage at Lake Merced. In 2009 surveys, this species was found in some San Francisco parks containing water bodies (Krauel, 2009)[20].
Pallid bat *Antrozous pallidus*	--	CSC	--	Prefers caves, crevices, hollow trees, or buildings in areas adjacent to open space for foraging. Associated with lower elevations in California.	**Low.** Suitable roosting habitat is available in buildings around Lake Merced This species was not detected during 2009 surveys in San Francisco parks (Krauel, 2009). Not expected to breed here but may be present on a transient basis.
Townsend's big-eared bat *Corynorhinus townsendii*	--	CSC	--	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings of rocky areas with caves or tunnels. Roosting sites limited. Extremely sensitive to human disturbance.	**Low.** Suitable roosting habitat is available in buildings around Lake Merced This species was not detected during 2009 surveys in San Francisco parks (Krauel, 2009).

[20] Krauel, J.K., *Foraging Ecology of Bats in San Francisco*, M.S. Thesis, San Francisco State University. Available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, in Case File No. 2001.0016E, 2009.

APPENDIX B (Continued)
SPECIAL STATUS SPECIES THAT MAY OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	**Federal Status**	**State Status**	**CNPS Listing**	**Habitat Description / Blooming Period**	**Potential to Occur in the Action Area**
Mammals (cont.)					
Yuma myotis *Myotis yumanensis*	--	--	--	Optimal habitats are open forests and woodlands with water sources to feed over. Roosts in buildings, trees, mines, caves, bridges, and rock crevices. Maternity colonies active May through July.	**Moderate.** Roosting habitat is available in tree/shrub foliage at Lake Merced. In 2009 surveys, this species was found in some San Francisco parks containing water bodies (Krauel, 2009).
hoary bat *Lasiurus cinereus*	--	--	--	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths; requires water.	**Low.** Roosting habitat is available in large-diameter trees at Lake Merced, but this species was not detected during 2009 surveys in San Francisco parks (Krauel, 2009). May be present on a transient basis.
American badger *Taxidea taxus*	--	CSC	--	Open grasslands with loose, friable soils.	**Low.** No suitable habitat present.
Point Reyes jumping mouse *Zapus trinotatus orarius*	--	CSC	--	Upland areas of bunch grass in marshes in Point Reyes.	**Low.** Project site is south of the known range for this species.

NOTES:

The “Potential for Effect” category is defined as follows:
High = Species is expected to occur and habitat meets species requirements.
Moderate = Habitat is only marginally suitable or is suitable but not within species geographic range.
Low = Habitat does not meet species requirements as currently understood in the scientific community.

STATUS CODES:

Federal:
FE = Listed as “endangered” under the federal Endangered Species Act
FT = Listed as “threatened” under the federal Endangered Species Act
FSC = NOAA Fisheries designated “species of concern”
FPD = Proposed delisted
FD = Delisted

CNPS:
List 1B = Plants rare, threatened, or endangered in California and elsewhere
List 2 = Plants rare, threatened, or endangered in California, but more common elsewhere
List 3 = Plants about which we need more information--a review list
List 4 = Plants of limited distribution--a watch list
LS = Locally Significant Species

State:
CE = Listed as “endangered” under the California Endangered Species Act
CT = Listed as “threatened” under the California Endangered Species Act
CSC = California Department of Fish and Wildlife designated “species of special concern”
CFP = California Department of Fish and Wildlife designated “fully protected”
SC = California Department of Fish and Wildlife designated “candidate threatened”
WL = California Department of Fish and Wildlife designated “watch list”
3503.5 = Eggs, Nests, and Nestlings Protected under section 3503.5 of the California Department of Fish and Game Code
* = California special animal

SOURCE: USFWS (2013), CDFG (2013b), CNPS (2013).