



SAN FRANCISCO PLANNING DEPARTMENT

MEMO

DATE: January 9, 2014
TO: San Francisco Planning Commission
FROM: Kei Zushi, Planning Department
RE: Appeal of Preliminary Mitigated Negative Declaration for the Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project, Planning Department Case No. 2012.1427E

HEARING DATE: January 16, 2014

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

An appeal has been received concerning a Preliminary Mitigated Negative Declaration for the following project:

Case No. 2012.1427E – Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project: The proposed project consists of: 1) construction of a perennial pond, approximately 1,600 sf in size, located approximately 400 to 500 feet southeast of Horse Stable Pond (HSP); 2) realignment of a portion of an existing golf cart path located west of the fairway for golf course hole number 14 and east of the tee box for golf course hole number 15; 3) removal of sediment and emergent vegetation within HSP and the connecting channel that links HSP with Laguna Salada (LS); 4) construction of steps and a maintenance walkway approximately 4.6 feet in width at the existing HSP pumphouse; and 5) replacement of a wooden retaining wall near the pumphouse with a concrete retaining wall at the existing HSP pumphouse. The proposed project is being constructed consistent with a Biological Opinion issued by the U.S. Fish and Wildlife Service (USFWS) and is separate and independent from the proposed Significant Natural Resource Areas Management Plan (SNRAMP), which is currently undergoing separate environmental review.

The project would be implemented in two locations, which cover a total of 35,000 noncontiguous sf within Sharp Park. The majority of work would be located on the southwest corner of the existing golf course, near HSP. One segment of an existing golf cart path is proposed to be realigned as part of this project. This golf cart path segment is located to the northeast of LS and to the southwest of Lakeside Avenue.

This matter is calendared for public hearing on January 16, 2014. Enclosed are the appeal letter, a comment letter, the staff response, the amended mitigated negative declaration, and the draft motion. If you have any questions related to this project's environmental evaluation, please contact me at (415) 575-9036 or kei.zushi@sfgov.org.

Thank you.

Memo



SAN FRANCISCO PLANNING DEPARTMENT

Appeal of Preliminary Mitigated Negative Declaration Executive Summary

HEARING DATE: January 16, 2014

Date: January 9, 2014
Case No.: **2012.1427E**
Project Location: **Sharp Park, City of Pacifica, San Mateo County**
Project Sponsor: San Francisco Recreation and Park Department (SFRPD)
Stacy Bradley – (415) 575-5601
stacy.bradley@sfgov.org
Staff Contact: Kei Zushi – (415) 575-9036
kei.zushi@sfgov.org

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

PROPOSED COMMISSION ACTION:

Consider whether to uphold staff's decision to prepare a Mitigated Negative Declaration (MND) under the California Environmental Quality Act (CEQA), or whether to overturn that decision and require additional information or analysis be added to the MND or the preparation of an Environmental Impact Report due to specified potentially significant environmental effects.

PROJECT DESCRIPTION:

The project sponsor proposes: 1) construction of a perennial pond, approximately 1,600 sf in size, located approximately 400 to 500 feet southeast of Horse Stable Pond (HSP); 2) realignment of a portion of an existing golf cart path located west of the fairway for golf course hole number 14 and east of the tee box for golf course hole number 15; 3) removal of sediment and emergent vegetation within HSP and the connecting channel that links HSP with Laguna Salada (LS); 4) construction of steps and a maintenance walkway approximately 4.6 feet in width at the existing HSP pumphouse; and 5) replacement of a wooden retaining wall near the pumphouse with a concrete retaining wall at the existing HSP pumphouse.

The proposed project is being constructed consistent with a Biological Opinion issued by the U.S. Fish and Wildlife Service (USFWS) and is separate and independent from the proposed Significant Natural Resource Areas Management Plan (SNRAMP), which is currently undergoing separate environmental review.

The project would be implemented in two locations, which cover a total of 35,000 noncontiguous sf within Sharp Park. The majority of work would be located on the southwest corner of the existing golf course, near HSP. One segment of an existing golf cart path is proposed to be realigned as part of this project. This golf cart path segment is located to the northeast of LS and to the southwest of Lakeside Avenue.

ISSUES:

The Planning Department published a PMND on September 18, 2013, and received a comment letter from Peter Baye on October 17, 2013 and an appeal letter from Brent Plater with Wild Equity Institute on October 18, 2013, appealing the determination to issue an MND.

The comment letter states that the PMND fails to adequately address the following issues:

1. Biological Resources
2. Hydrological Resources
3. Archeological Resources

The appeal letter states that the PMND fails to adequately address the following issues:

1. Biological Resources
2. Hydrological Resources
3. Cumulative Impacts
4. Consistency with the 1995 and proposed 2006 Significant Natural Resource Areas Management Plans (SNRAMPs)
5. Consistency with the policies of the California Coastal Act
6. Consistency with the federal California red-legged frog recovery plan
7. "Piecemealing"
8. Project alternatives
9. Project scope or impacts that warrant preparation of an EIR

No other comment letters or appeals of the PMND were received.

All of the issues raised in the Appeal Letter and comment letter submitted by Peter Baye have been addressed in the attached materials, which include:

1. A draft Motion upholding the decision to issue a MND;
2. Exhibit A: Planning Department Response to the Appeal Letter;
3. Exhibit B: Comment Letter from Peter Baye;
4. Exhibit C: Appeal Letter from Brent Plater on behalf of Wild Equity Institute; and

5. Exhibit D: PMND and Initial Study, as amended, with deletions shown in ~~striketrough~~ and additions shown in double-underlined text. The amendments in the PMND do not change the overall conclusion of the PMND.

RECOMMENDATION:

Staff recommends that the Planning Commission adopt the motion to uphold the PMND. No substantial evidence supporting a fair argument that a significant environmental effect may occur as a result of the project has been presented that would warrant adding information or analysis to the MND or preparation of an Environmental Impact Report.



SAN FRANCISCO PLANNING DEPARTMENT

Planning Commission Motion [XXXX]

HEARING DATE: January 16, 2014

Hearing Date: January 16, 2014
Case No.: **2012.1427E**
Project Location: **Sharp Park, City of Pacifica, San Mateo County**
Project Sponsor: San Francisco Recreation and Park Department (SFRPD)
Stacy Bradley – (415) 575-5601
stacy.bradley@sfgov.org
Staff Contact: Kei Zushi – (415) 575-9036
kei.zushi@sfgov.org

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

ADOPTING FINDINGS RELATED TO THE APPEAL OF THE PRELIMINARY MITIGATED NEGATIVE DECLARATION, FILE NUMBER 2012.1427E FOR THE PROPOSED DEVELOPMENT ("PROJECT") AT SHARP PARK IN THE CITY OF PACIFICA IN SAN MATEO COUNTY

MOVED, that the San Francisco Planning Commission (hereinafter "Commission") hereby AFFIRMS the decision to issue a Mitigated Negative Declaration, based on the following findings:

1. On November 14, 2012, pursuant to the provisions of the California Environmental Quality Act ("CEQA"), the State CEQA Guidelines, and Chapter 31 of the San Francisco Administrative Code, the Recreation and Parks Department submitted an Environmental Evaluation Application for the Project to the Planning Department ("Department"), in order that the Department might conduct an initial evaluation to determine whether the Project might have a significant impact on the environment.
2. On September 18, 2013, the Department determined that the Project, as proposed, could not have a significant effect on the environment.
3. On September 18, 2013, a notice of determination that a Mitigated Negative Declaration would be issued for the Project was duly published in a newspaper of general circulation in the City, and the Mitigated Negative Declaration posted in the Department offices, and distributed all in accordance with law.
4. On October 17, 2013, a commenter letter concerning the decision to issue a Mitigated Negative Declaration was submitted by Peter Baye.
5. On October 18, 2013, an appeal of the decision to issue a Mitigated Negative Declaration was timely filed by Brent Plater on behalf of Wild Equity Institute.

6. A staff memorandum, dated January 9, 2014, addresses and responds to all points raised by the commenter in the comment letter and the appellant in the appeal letter. That memorandum is attached as Exhibit A and staff's findings as to those points are incorporated by reference herein as the Commission's own findings. Copies of that memorandum have been delivered to the City Planning Commission, and a copy of that memorandum is on file and available for public review at the San Francisco Planning Department, 1650 Mission Street, Suite 400.
7. On January 9, 2014, amendments were made to the Preliminary Mitigated Negative Declaration, to address points raised by the commenter and appellant. Such amendments do not include new, undisclosed environmental impacts and do not change the conclusions reached in the Preliminary Mitigated Negative Declaration. The changes do not require "substantial revision" of the Preliminary Mitigated Negative Declaration, and therefore recirculation of the Preliminary Mitigated Negative Declaration is not required.
8. On January 16, 2014, the Commission held a duly noticed and advertised public hearing on the appeal of the Preliminary Mitigated Negative Declaration, at which testimony on the merits of the appeal, both in favor of and in opposition to, was received.
9. All points raised in the appeal of the Preliminary Mitigated Negative Declaration at the January 16, 2014 City Planning Commission hearing have been responded to either in the memorandum or orally at the public hearing.
10. After consideration of the points raised by appellant, both in writing and at the January 16, 2014 hearing, the San Francisco Planning Department reaffirms its conclusion that the proposed project could not have a significant effect upon the environment.
11. In reviewing the Preliminary Mitigated Negative Declaration issued for the Project, the Planning Commission has had available for its review and consideration all information pertaining to the Project in the Planning Department's case file.
12. The Planning Commission finds that Planning Department's determination on the Mitigated Negative Declaration reflects the Department's independent judgment and analysis.

The San Francisco Planning Commission HEREBY DOES FIND that the proposed Project, could not have a significant effect on the environment, as shown in the analysis of the Mitigated Negative Declaration, and HEREBY DOES AFFIRM the decision to issue a Mitigated Negative Declaration, as prepared by the San Francisco Planning Department.

I hereby certify that the foregoing Motion was ADOPTED by the City Planning Commission on January 16, 2014.

Jonas Ionin
Commission Secretary

Motion No. XXXX
Hearing Date: January 16, 2014

Case No. 2012.1427E
Sharp Park Safety, Infrastructure Improvement,
and Habitat Enhancement Project

AYES:

NOES:

ABSENT:

ADOPTED: January 16, 2014



SAN FRANCISCO PLANNING DEPARTMENT

MEMO

Exhibit A to Draft Motion Planning Department Response to Appeal of Preliminary Mitigated Negative Declaration

CASE NO. 2012.1427E – SHARP PARK SAFETY, INFRASTRUCTURE IMPROVEMENT,
AND HABITAT ENHANCEMENT PROJECT PUBLISHED ON SEPTEMBER 18, 2013

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

BACKGROUND

An environmental evaluation application (Case No. 2012.1427E) for the proposed project at Sharp Park in the City of Pacifica in San Mateo County was filed by the project sponsor, the City and County of San Francisco's (CCSF's) Recreation and Park Department (SFRPD), on November 14, 2012. The proposed project includes elements that are analyzed in, and in some instances required by, a Biological Opinion issued by the U.S. Fish and Wildlife Service (USFWS)¹ and consists of: 1) construction of a perennial pond, approximately 1,600 square feet (sf) in size, located approximately 400 to 500 feet southeast of Horse Stable Pond (HSP); 2) realignment of a portion of an existing golf cart path located west of the fairway for golf course hole number 14 and east of the tee box for golf course hole number 15; 3) removal of sediment and emergent vegetation within HSP and the connecting channel that links HSP with Laguna Salada (LS); 4) construction of steps and a maintenance walkway approximately 4.6 feet in width at the existing HSP pumphouse; and 5) replacement of an existing wooden retaining wall with a concrete retaining wall at the existing HSP pumphouse.

The project would be implemented in two locations, which combined total less than an acre (approximately 35,000 noncontiguous sf), within Sharp Park, which is 417 acres. The majority of work would be located in the southwest corner of the existing golf course, near HSP. One segment of an existing golf cart path is proposed to be realigned as part of this project. This golf cart path segment is located to the northeast of LS and to the southwest of Lakeside Avenue.

The Sharp Park Golf Course is located within an 845-acre watershed. HSP is located south of LS and consists of an open water pond and a fresh-to-brackish water wetland. It is connected to LS via an existing approximately 1,000-foot-long channel with culverts (metal pipes that are located underneath golf cart pathways), which was constructed to drain water from LS to HSP. Together these three features form a managed wetland complex, which SFRPD regularly maintains, and SFRPD adjusts the water level through the operation of mechanical pumps.

Water levels in the LS wetland complex are controlled by existing pumps located in the pumphouse at the southwest corner of HSP. Flood waters in the wetland complex are removed by

¹ U.S. Fish and Wildlife Service (USFWS). *In Reply Refer To: 08ESMF00-2012-F-0082-2, Formal Endangered Species Consultation on the Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project in San Mateo County, California*, October 2, 2012 ("Biological Opinion"). This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

the pumps, which pump water into the Pacific Ocean during the winter when water levels in the pond become too high. The pumps control water levels in HSP and may affect water levels in LS when the channel connecting the two water bodies creates a surface water connection between them. The existing pump system consists of a large pump (rated 10,000 gallons per minute) and a small pump (rated 1,500 gallons per minute), located in a pumphouse with pipes built through the seawall to an outfall. Operation of the flood control pump system is necessary to manage floodwaters both on Sharp Park and adjacent properties. During normal rainfall years, floodwaters into LS back up onto the golf course. During heavy rainfall years, extensive flooding can occur in areas of play on the golf course and may also threaten nearby residences.²

The primary purpose of the proposed construction of the new pond, the golf cart path realignment, the pumphouse improvements, and the sediment and vegetation removal is to: 1) restore habitat in several locations within the wetland complex for the California red-legged frog (“Frog”) and the San Francisco garter snake (“Snake”), and 2) facilitate continued operation of pumps and maintenance of the existing infrastructure. Additionally, the sediment and vegetation removal would ensure that SFRPD can continue to manage water levels in the LS wetland complex by removing impediments to water flow within the wetland complex. Sediment removal is typical of maintenance activities that occurred in the past at Sharp Park and is considered typical maintenance for managed wetlands to prevent excessive accumulation of sediment in the wetland complex. Excessive accumulation of sediment in HSP and the connecting channel could cause malfunction of the pumps by allowing sediment to enter the pump system and/or preventing the water from entering the pump intake.³ Another purpose of the proposed improvements to the pumphouse (which, as noted above, include construction of steps and a maintenance walkway and replacement of an existing wooden retaining wall with a new concrete retaining wall) is to improve the safety conditions of workers operating and maintaining the pumps by enhancing access to the pump intake structure.

There are several special-status species⁴ that are known to occur on and near the project site. These species include Frogs and Snakes. The Frog is listed as “threatened” under the Federal Endangered Species Act (FESA) and a California Species of Special Concern (SSC).^{5,6} The Snake is

² USFWS. *Biological Opinion*.

³ Stacy Bradley, SFRPD. *Email to Kei Zushi, San Francisco Planning Department, Project Description Confirmation*, January 07, 2014. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

⁴ See Section E.13, Biological Resources of the PMND, for the definition of “Special-Status Species.”

⁵ The Federal Endangered Species Act (FESA) defines “Threatened Species” as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

⁶ A Species of Special Concern (SSC) is a species, subspecies, or distinct population of an animal (fish, amphibian, reptile, bird, and mammal) native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria:

- is extirpated from the State or, in the case of birds, in its primary seasonal or breeding role;
- is listed as Federally-, but not State-, threatened or endangered; meets the State definition of threatened or endangered but has not formally been listed;

listed as “endangered” under the FESA and classified as “endangered” and “fully protected” under the California Fish and Game Code^{7,8,9,10,11} (see Section E.13, Biological Resources in the Preliminary Mitigated Negative Declaration (PMND) for more information).

Under the Federal Endangered Species Act (FESA) (16 United States Code [USC], 1531-1543), if a proposed project “may affect” a listed species or designated critical habitat, the project sponsor is required to prepare a Biological Assessment evaluating the nature and severity of the expected effect. In response, the USFWS issues a Biological Opinion with a determination that the proposed action may either jeopardize the continued existence of one or more listed species (jeopardy finding), result in the destruction or adverse modification of critical habitat (adverse modification finding), not jeopardize the continued existence of any listed species (no jeopardy finding), or not result in adverse modification of critical habitat (no adverse modification finding). The Biological Opinion issued by the USFWS may stipulate discretionary “reasonable and prudent” conservation measures, and if the project would not jeopardize a listed species, the USFWS issues an incidental take statement to authorize the proposed activity.

A Biological Assessment¹² was prepared by SFRPD. A Biological Opinion¹³ was issued by the USFWS through FESA Section 7 consultation, which was initiated by the U.S. Army Corps of Engineers (USACE) for fill in HSP (waters of the U.S.¹⁴) resulting from the proposed construction

-
- is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status;
 - has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for State threatened or endangered status.

⁷ The FESA defines “Endangered Species” as any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of the FESA would present an overwhelming and overriding risk to man.

⁸ The California Fish and Game Code defines “Endangered Species” as a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease. Any species determined by the Fish and Game Commission as “endangered” on or before January 1, 1985, is an “endangered species.”

⁹ The classification of “Fully Protected” was the State’s initial effort in the 1960’s to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, mammals, amphibians and reptiles, birds and mammals. Most fully protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations.

¹⁰ California Department of Fish and Wildlife (CDFW). *Fully Protected Animals*. Available online at: http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/fully_pro.html. Accessed July 19, 2013.

¹¹ CDFW. *State and Federally Listed Endangered & Threatened Animals of California*, January 2013. Available online at: <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEAnimals.pdf>. Accessed July 19, 2013.

¹² SFRPD. *Biological Assessment, Sharp Park Safety, Infrastructure Improvement and Habitat Enhancement Project*, May 2, 2012 (“Biological Assessment”). This Biological Assessment was amended on August 16, 2012. These documents are available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹³ USFWS. *Biological Opinion*.

¹⁴ Under the Federal Clean Water Act (FCWA) Sections 404 and 401, “jurisdictional wetlands and waters of the U.S.”

of the maintenance walkway and replacement of the existing wooden retaining wall around the existing pumphouse. The proposed project was analyzed in the Biological Opinion, as was the ongoing maintenance and operations activities at Sharp Park and some additional uplands habitat restoration work at Sharp Park. The proposed construction of the perennial pond, which was analyzed in the PMND, is one of the conservation measures set forth in the Biological Opinion.

The proposed project would require the following project approvals,¹⁵ with the approval by the San Francisco Recreation and Park Commission (SFRPC) identified as the Approval Action under Chapter 31 of the San Francisco Administrative Code for the whole of the proposed project:

- Approval by SFRPC
- California Endangered Species Act (CESA) consultation with the California Department of Fish and Wildlife (CDFW)¹⁶ concerning fully protected species (i.e., Snakes)
- Federal Clean Water Act (FCWA) Section 404 Approval by the USACE
- FCWA Section 401 Water Quality Certification Approval by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB)
- Fish and Game Code Section 1602 Lake or Streambed Alteration Agreement Approval by the CDFW
- Coastal Development Permit Approval by the California Coastal Commission (CCC)

In addition, the proposed project may require the following project approval:

- National Pollution Discharge Elimination System (NPDES) Permit by SFBRWQCB

A PMND was published on September 18, 2013. On October 17, 2013, Peter Baye submitted a comment letter concerning the PMND. Mr. Baye's comments are listed and addressed below. On October 18, 2013, Brent Plater with Wild Equity Institute filed a letter appealing the PMND and its concerns are listed below. Copies of both letters are included in this appeal packet as Exhibits B and C, respectively. The concerns set forth in the appeal letter and the comment letter are listed generally in the order presented in the respective letters.

CONCERN 1: The appellant asserts that there is a fair argument that the proposed project may have a significant effect on the environment. The appellant asserts that the proposed project would expand the operations of the existing pumps at HSP by removing the obstructions (sediment and emergent vegetation) to water flow, which would in turn increase the velocity

include one of the following: 1) traditional navigable waters; 2) wetlands next to traditional navigable waters; 3) nonnavigable tributaries of traditional navigable waters that are relatively permanent, where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); or 4) wetlands that directly abut the tributaries described in Item 3), above. See Section E.13, Biological Resources of the PMND, for more information about the definition of "jurisdictional wetlands and waters of the U.S."

¹⁵ As noted above, the USFWS has already issued a Biological Opinion, including an Incidental Take Statement, for the proposed project (among other activities) through FESA Section 7 formal consultation.

¹⁶ Formerly known as the California Department of Fish and Game (CDFG)

and amount of water flow in the LS wetland complex. Based on this, the appellant asserts that the project would result in significant impacts to Frogs, Snakes, and to Sharp Park’s water quality and hydrology.

“Preeminent herpetologists, coastal ecologists, and hydrologists have reviewed the revisions and mitigation measures announced in the PMND. Below you will find the facts, reasonable assumptions predicated upon those facts, and expert opinions that explain how, even as revised and mitigated, the Pumphouse Project will cause significant adverse effects on the threatened California red-legged frog (*Rana draytonii*), the endangered San Francisco gartersnake (*Thamnophis sirtalis tetrataenia*), and Sharp Park’s hydrology and water quality.” (Page 1 of the Appeal Letter)

“This evidence makes clear that there is, at the very least, a fair argument that the Pumphouse Project may have a significant effect on the environment, which in turn requires the Department to prepare an Environmental Impact Report (‘EIR’) before approving the project. Cal. Pub. Res. Code § 21151; *Sierra Club v. County of Sonoma*, 6 Cal. App. 4th 1307, 1316 (1992) (‘Section 21151 creates a low threshold requirement for initial preparation of an EIR and reflects a preference for resolving doubts in favor of environmental review when the question is whether any such review is warranted. [citations] For example, if there is a disagreement among experts over the significance of an effect, the agency is to treat the effect as significant and prepare an EIR.’).” (Page 1 of the Appeal Letter)

“The PMND’s project description, however, has failed to include the Pumphouse Project’s key objective: to operate the pumphouse more extensively than it has ever been operated before. This increase in pumphouse operations is likely to have significant, adverse consequences on Sharp Park’s threatened and endangered species, its water quality, and its hydrology.” (Page 2 of the Appeal Letter)

“THE PUMPHOUSE PROJECT’S PRIMARY PURPOSE IS TO INCREASE PUMPHOUSE OPERATIONS, YET THE EFFECTS OF PUMPHOUSE OPERATIONS HAVE BEEN EXCLUDED FROM ENVIRONMENTAL REVIEW.” (Page 2 of the Appeal Letter)

“Specifically, SFRPD has acknowledged that (1) the wetland complex’s aquatic vegetation moderates the flow of water from Laguna Salada to the pumphouse, and (2) if the aquatic vegetation was removed the pumphouse would drain more of the wetland complex, and at faster rates. For example, in a recent deposition John Ascariz, the Recreation and Park Department’s Station Engineer for the pumphouse, explained that the Laguna Salada wetland complex moderates pumphouse operations at Sharp Park, and that pumphouse operations would increase if aquatic vegetation were removed from the system:” (Page 3 of the Appeal Letter)

“The PMND’s assumption that the Pumphouse Project will have no effect on the rate and extent of baseline pumping operations is unsupported by the record: indeed, the assumption is flatly contradicted by the project sponsor itself.” (Page 5 of the Appeal Letter)

“The Project Sponsor predicts that the Pumphouse Project will increase the rate water flows to the pumphouse, and keep Laguna Salada hydrologically connected to the pumphouse throughout a greater portion of the year. This will expand pumphouse operations at Sharp Park, which will in turn cause significant environmental effects on a variety of resources... ..” (Page 5 of the Appeal Letter)

“EXPANDING PUMPHOUSE OPERATIONS WILL HAVE SIGNIFICANT ADVERSE EFFECTS ON THE CALIFORNIA RED-LEGGED FROG.” (Page 5 of the Appeal Letter)

“The description of the proposed project activities on page 5 of the MND states that the channel would be cleared of vegetation and sediment to remedy obstruction of flows between HSP and the main pond or lagoon, improving ability to drain water from the lagoon by pumping: ‘3) removal of sediment and emergent vegetation within HSP and the connecting channel that links HSP with LS’. The MND, however, completely fails to assess the hydrological and ecological impacts of increasing drainage of the lagoon by increasing hydraulic connectivity between the main lagoon pond and HSP, even though it is clearly the basic purpose of the action. Any significant change in the duration and depth of flooding or soil saturation in lagoon wetlands has important ecological effects. Increased drainage of wetlands, above baseline (pre-project) conditions is a potentially significant impact I cited in my scoping comments on this project (Baye 2013). My scoping comments appear to be entirely ignored about this most basic modification of lagoon wetland hydrology, and their impacts on further spread of cattails and tules.” (Page 2 of Mr. Baye’s Letter)

“The MND completely fails to address potentially significant direct and indirect hydrological impacts of the proposed project’s drainage component on Laguna Salada wetlands, despite my detailed scoping comments on this subject. There is no proposed mitigation for increasing the drainage of the lagoon, and making its bed shallower more often than pre-project conditions. Increasing the drainage of the lagoon will increase the spread of cattails and tules over the remaining open water.” (Page 3 of Peter Baye’s Comment Letter)

RESPONSE TO CONCERN 1: The appellant fails to present a fair argument supported by substantial evidence in the record that continued operation of the existing pumphouse would cause any significant impacts on the environment. The pumps are part of the existing, or baseline, conditions. Moreover, the appellant’s assertion that the proposed project would increase the velocity and amount of water flow in the LS wetland complex is speculative and not based on fact.

The appellant’s assertion that the proposed project will cause significant adverse effects on Frogs, Snakes, and Sharp Park’s hydrology and water quality is speculative and based on a mischaracterization of the proposed project. First, and most significantly, the existing pumphouse operations are part of the baseline conditions at the project site and are not a part of the proposed project. Thus, although the existing pumphouse operations inform the project setting and are part

of the baseline conditions against which the proposed project's impacts are measured, the operation of the pumphouse itself is not properly considered part of the proposed project.

Second, the appellant asserts that the proposed project would expand the operations of the existing pumps at HSP. This is inaccurate. The proposed project would not expand the operations of the existing pumps. The proposed project is intended to prevent excessive accumulation of sediment in HSP and the connecting channel, which could cause malfunction of the pumps by allowing sediment to enter the pump system and/or preventing the water from entering the pump intake.¹⁷

The predominant factors that affect the rate, frequency and duration of pumping are: 1) pump infrastructure and protocols for pump operation; and 2) precipitation and water inflows.¹⁸ The pump infrastructure and protocols would not be adjusted, modified, or altered as part of the proposed project. SFRPD will continue to adjust pump levels throughout the breeding season to protect Frog egg masses and reduce flood potential. The maximum pumping rate (amount/time) is determined by the pumping capacity. Specifically, the small pump can remove water up to a rate of 1,500 gallons per minutes (gpm) and the larger pump up to 10,000 gpm.¹⁹ No changes to the pump infrastructure are proposed as part of the project, therefore the water removal rate would not change with project implementation. Precipitation and inflows are outside the control of SFRPD. The primary factor that drives precipitation and inflows is regional weather conditions. A secondary factor, which is subject to minimal short-term change, is local land use patterns, including the extent of impervious surfaces. The amount of water that is removed over a unit of time via operation of the pumps depends on the amount and timing of precipitation and inflows as well as the amount of time the pumps operate and the level at which the pumps are set, which is determined during the Frog breeding season by the location of egg masses. None of these operational protocols will be changed by this project, including the sediment and vegetation removal. Therefore, the appellant's assertion is factually incorrect.

Third, the appellant asserts that by removing sediment and vegetation from HSP and portions of a channel that connect HSP and LS, the proposed project would increase the velocity and amount of water flowing in the LS wetland complex, resulting in a significant impact on the environment. This assertion appears to be based on the assumption that by removing sediment and emergent vegetation more water would be pumped out of the LS wetlands complex and at a rate that would result in impacts to special-status species. The appellant has not provided any analysis to support this assumption. As discussed above, the velocity and amount of water in the wetland complex is determined by the pump infrastructure and operational protocols, which are not being altered by this project. The proposed sediment and vegetation removal, intended to prevent excessive

¹⁷ Stacy Bradley, SFRPD. *Email to Kei Zushi, San Francisco Planning Department, Project Description Confirmation*, January 07, 2014. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁸ *Ibid.*

¹⁹ USFWS. *Biological Opinion*.

accumulation of sediment in the wetland complex, would not increase the velocity or amount of water flowing through the pumps.

The appellant asserts, based partly on the deposition of John Ascariz, SFRPD's stationary engineer, that: 1) the wetland complex's aquatic vegetation moderates the flow of water from Laguna Salada to the pumphouse; and (2) if the aquatic vegetation was removed the pumps would drain more of the wetland complex, and at faster rates. This assertion is based on a mischaracterization of what John Ascariz said in the deposition. Mr. Ascariz was speaking generally about park management and operations and responding to broad hypothetical questions regarding pump operations and unspecified amounts of vegetation removal. He was not discussing the proposed project. This project's proposed sediment and vegetation removal would not increase the velocity and amount of water flow in the wetland complex. Rather, this is controlled by pump infrastructure and operational protocols.

The appellant has presented no hydrological or hydraulic modeling analyses prepared by a qualified professional to demonstrate that the project would increase the velocity and amount of water flow in the LS wetland complex. Instead, this argument is based on speculation regarding the effect that removal of sediment and vegetation may have. Because the pump infrastructure and operation will not be adjusted or altered as part of this project, the project itself would not cause the rate or amount of water flow in the LS wetland complex to increase even after the obstructions (sediment and emergent vegetation) are removed from HSP and the connecting channel.

Even if the appellant were correct in its assertion that the project would increase the velocity of water flow in the LS wetland complex, it does not directly follow that any increase in water flow velocity would result in any adverse impacts to Frogs, Snakes, or to Sharp Park's hydrology or water quality. The appellant has not provided any evidence that such an adverse impact would occur. The pump operations would comply with ongoing conservation measures to protect Frog egg masses from potential desiccation in accordance with the Biological Opinion. These conservation measures are already in place and would continue to govern the operation of the pumps and water-level management under the proposed project.²⁰ These conservation measures include, but are not limited to, monitoring of Frog egg masses and water levels, visual surveys on Frog egg masses, and adjustment of the water levels to protect Frog egg masses (see pages 13 and 14 of the Biological Opinion). As a result, the appellant fails to present a fair argument based on substantial evidence that the proposed project would result in a significant impact.

As discussed in the amended PMND, the proposed project's potential impacts would be reduced to a less-than-significant level with implementation of Mitigation Measures M-BIO-2a (Protection of Frog, Snake, and Western Pond Turtle), M-BIO-2b (Protection of Special-Status Species and

²⁰ Stacy Bradley, SFRPD. *Email to Kei Zushi, San Francisco Planning Department, Project Description Confirmation*, January 07, 2014. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

Water Quality from Acid Sulfate Soils and Other Components), M-BIO-2c (Protection of Bird Species), M-BIO-4a (Protection of Wetlands and Natural Habitat), M-BIO-4b (Wetland Mitigation Plan for Temporarily Affected Areas), M-CP-2 (Archeological Testing), M-CP-3 (Paleontological Training Program and Alert Sheet), M-CP-4 (Human Remains, Associated or Unassociated Funerary Objects), and M-AQ-2 (Preparation and Implementation of a Dust Control Plan).

There is no substantial evidence in the record that the project as mitigated could result in a significant effect on the environment, and appellant’s arguments should be rejected.

CONCERN 2: The appellant asserts that ongoing pumphouse operations should be considered part of the proposed project.

“BY EXCLUDING PUMPHOUSE OPERATIONS FROM THE PROJECT DESCRIPTION THE DEPARTMENT HAS FAILED TO CONSIDER AND MITIGATE SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PUMPHOUSE PROJECT.” (Page 2 of the Appeal Letter)

“An accurate project description is an indispensable element of informed and legally sufficient environmental review processes under CEQA. *Cnty. of Inyo v. City of Los Angeles*, 71 Cal. App. 3d 185, 193, (Ct. App. 1977) (Calling an accurate project description the “*sine qua non*” of CEQA review).” (Page 2 of the Appeal Letter)

RESPONSE TO CONCERN 2: Pumphouse operations are part of the existing, or “baseline” conditions at the project site, and no changes are proposed to the pumps or the pumphouse operations as part of the proposed project. Thus, analysis of any impacts resulting from pump operations is not required under CEQA.

The ongoing operations of the existing pumps at HSP are considered to be a baseline condition for the purpose of environmental review for the proposed project. CEQA requires that a proposed project’s effects be measured against the existing, or “baseline,” conditions at the project site and in its vicinity, and not that the baseline conditions be considered part of the proposed project’s effects. Although a new exterior stair and walkway would be added to the pumphouse and an existing wooden retaining wall would be replaced with a concrete retaining wall at the pumphouse, no other changes would be made to the pumphouse under the proposed project. No changes at all are proposed to the pumps themselves or to the manner in which they are currently operated by SFRPD staff. Therefore, no impact analysis is required concerning the ongoing operations of the existing pumps because that is part of the baseline conditions of the project site. As discussed in Response to Concern 1, the proposed sediment and vegetation removal would not affect pumphouse operations.

CONCERN 3: The appellant asserts that “expanded” pumping operations will result in an increased impact to Frogs and that federal regulators believe the City will take virtually all Frog egg masses laid at Sharp Park each year that it operates.

“Alarming, when the Pumphouse Project is implemented regulators believe the City will take *virtually all egg masses* laid at Sharp Park each year that it operates - up to 130 egg masses every winter breeding season, roughly equivalent to the entire number of egg masses laid in the frog’s most prolific and fecund breeding seasons.”(Page 6 of the Appeal Letter)

RESPONSE TO CONCERN 3: The appellant’s claim that regulators believe the City will take virtually all Frog egg masses laid at Sharp Park each year that it operates is inaccurate and misleading.

Contrary to the appellant’s assertion, the proposed project would not take all egg masses laid at Sharp Park, nor would it take “up to 130 egg masses every winter breeding season.” Rather, the Incidental Take Statement issued by the USFWS found that a total of 130 egg masses per year would be subject to incidental take resulting from ongoing operation and maintenance at Sharp Park.

“Incidental take” is a term of art under the FESA. “Take” is generally defined as harming or harassing federally listed species and is largely prohibited, but certain “incidental” take may be allowed where it is not the primary purpose of a federal action and is done in compliance with an incidental take statement. Here, because the project would require approvals under the FCWA, the USFWS issued an Incidental Take Statement as part of its Biological Opinion, which considered the effects on Frogs and Snakes of the proposed project combined with certain uplands restoration work and ongoing maintenance and operations of the golf course.

The Biological Opinion prepared for this project found that a total of 130 egg masses per year would be subject to incidental take during a 10-year operation and maintenance period at Sharp Park (see page 40 of the Biological Opinion). Ongoing operation and maintenance is not considered part of this project, and 130 egg masses is not the number of egg masses anticipated to be subject to incidental take resulting from the proposed project. The USFWS found that the activities described in the Biological Opinion, which included the proposed project as well as other activities, would not jeopardize the continued existence of Frogs or Snakes (see Page 38 of the Biological Opinion)--meaning, in other words, that the project’s impacts to those species would be less than significant. The USFWS anticipated the extent of incidental take resulting from the proposed project, including conservation measures, as follows (see pages 39 and 40 of the Biological Opinion):

- 1) All Frogs in the 0.624-acre area within the HSP construction site will be subject to incidental take in the form of harassment and capture;
- 2) In total one Frog adult will be subject to incidental take in the form of death or injury as a result of construction activities;
- 3) All Snakes in the 0.624-acre construction area will potentially be harassed as a result of ground disturbing activities, and take of this species is expected to be in the form of harassment and no Snake is expected to be killed or injured as a result of construction activities; and

- 4) All Snakes and Frogs in the restoration area footprint will be subject to incidental take in the form of harassment as a result of the direct effects of removal of plants, revegetation activities, and other activities associated with pond construction. (*Emphasis added*)

Based on the above findings in the Biological Opinion and the mitigation measures identified in the PMND, the PMND concluded that the proposed project would not result in any significant biological resources impacts related to Frogs or Snakes. The appellant fails to show that the extent of incidental take anticipated to result from the proposed project would result in any significant biological resources impact related to Frogs or Snakes.

CONCERN 4: The appellant asserts that the proposed project would remove sediment in the area of the connecting channel that is highest in elevation and that this would hydrologically connect LS and HSP for a greater portion of the year and potentially reverse the flow of water from LS to HSP, resulting in significant impacts to protected species, water quality, and hydrology.

“... the Pumphouse Project proposes to remove 96,948 liquid gallons (480 cubic yards) of sediment from the connecting channel. The portions of the connecting channel to be dredged include the highest point (6.2 feet) along the longitudinal profile of the channel: the area near the culvert passing under the 12th fairway of the golf course. If this area is dredged, Laguna Salada will remain hydrologically connected to the pumphouse for a greater portion of the year: which will in turn result in expanded pumping operations that drain Laguna Salada’s wetland complex. Exhibit F, p. 4.” (Page 7 of the Appeal Letter)

“This increased hydrological connectivity may result in significant adverse environmental effects in one of two ways. First, if the Project Sponsor is correct and the connectivity permits SFRPD to drain the Laguna Salada wetland complex more rapidly and thoroughly, the hydrological resources presently preserved in the Laguna Salada complex will be adversely affected. For example, draining wetlands is known to increase tule and cattail populations, and as these species become more numerous Laguna Salada’s open water habitats would decrease in size. Dr. Peter Baye, *Critical Review of the Biological Assessment for the ‘Sharp Park Safety, Infrastructure Improvement and Habitat Enhancement Project’* May 2012. p. 5 (Exhibit G, p. 9). However, this effect is not considered by the PMND: even though this threat is considered so significant at Horse Stable Pond that SFRPD is proposing to destroy the frog’s cover habitat to create open water breeding habitat.” (Pages 7 and 8 of the Appeal Letter)

“Second, it is also possible that the Project Sponsor is not correct, and that the Pumphouse Project will actually reverse the flow of water from Laguna Salada to Horse Stable Pond. Exhibit F, p. 4. Kamman Hydrology is the author of the Hydrologic Assessment that the Department relies upon to justify the PMND’s hydrology conclusions. But Kamman has explained that SFRPD and the Department are not accurately interpreting his hydrologic study. In his Aug. 3, letter, Kamman explains that storm runoff into Horse Stable Pond is roughly double the amount of storm runoff into Laguna Salada. Because Horse Stable Pond’s margin is much more steeply sloped than

Laguna Salada, the storm runoff causes Horse Stable Pond's surface level to rise much more rapidly than the surface level of Laguna Salada, which tends to spread outward across its shallow margins, rather than upward. Because of this, initial storm surges tend to drive water from the high-elevation Horse Stable Pond through the connecting channel and into the lower-elevation Laguna Salada. *Id.* at 5." (Page 8 of the Appeal Letter)

"The practical consequences of this analyses are two-fold: first, removing vegetation from the connecting channel will increase flooding at Sharp Park Golf Course compared to present conditions as waters from Horse Stable Pond are driven into Laguna Salada and extend outward along Laguna Salada's shallow margin. *Id.* Second, as waters flow from Horse Stable Pond into Laguna Salada (and therefore away from the pumphouse), the pumphouse will not function as waters flow away from its intake pipe." (Page 8 of the Appeal Letter)

RESPONSE TO CONCERN 4: LS and HSP are already hydrologically connected throughout the Frog breeding season. The proposed project would not substantially alter the baseline hydrologic connection between the two water bodies; even if it did, appellant has not provided any evidence that such a change would cause any significant biological resources impacts.

The appellant asserts that the proposed sediment removal in the connecting channel would occur in the area that is highest in elevation, which is located near the culvert passing under the 12th fairway of the golf course, and that this would result in an increased hydrological connection between HSP and LS. Appellant asserts that this, in turn, would increase tule and cattail populations and potentially reverse the flow of water between HSP and LS.

First, the appellant is wrong in its assertion that the proposed project would result in any increased hydrological connection between HSP and LS. These two water bodies are already connected throughout the rainy season. The base elevation of the culvert that connects HSP and LS is 6.54 feet NAVD 88, which translates to 0.57 on the pumphouse gauge.²¹ Pumphouse gauge levels noted during winter field surveys for CRLF have not been recorded at or below 0.57,²² therefore the two water bodies are already connected throughout the breeding season. As a result, the appellant's assertion that the proposed project would allow LS and HSP to hydrologically connect for a greater portion of the year is based on an inaccurate understanding of the base hydrological conditions of the project site.

Second, the elimination of sediment build-up around the culvert would not increase the hydrological connection between HSP and LS or change the current direction of water flow in the connecting channel. The culvert is a metal pipe at a fixed elevation within the connecting channel,

²¹ Clearwater Hydrology. *Total Station survey of Horse Stable Pond pump house floor and inlet staff gage- Sharp Park Golf Course, Pacifica, CA*, November 15, 2011. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

²² SFRPD. *Monitoring Data Sheets, 2007 through 2013*. These documents are available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

and the sediment removal would not affect the fixed elevation of the culvert.²³ Therefore, the project would not result in increased hydrological connection between HSP and LS even during the dry season.

Third, the appellant's assertion that the proposed sediment and emergent vegetation removal would result in adverse impacts (increased tule and cattail populations and potentially reverse flow of water between HSP and LS) is based on the assumption that the proposed sediment removal would create greater connectivity between LS and HSP, which has not been demonstrated as a condition resulting from the proposed project. The proposed sediment and emergent vegetation removal in and of itself would not result in a significant impact to special-status species or their habitats because it would be subject to various mitigation measures, including inspection and monitoring by biological monitors, to protect special-status species in accordance with the Biological Opinion. Therefore, the appellant has failed to demonstrate that the proposed sediment removal would result in such adverse impacts.

Fourth, even if the proposed project were to alter the relative elevation between the two water bodies as the appellant asserts, this would not change the current direction of water flow in the connecting channel because pump operational protocols are what determine the water levels that would maximize the protection of species during the rainy season. These ongoing operational protocols are part of the baseline conditions for the project and are, in part, dictated by the Biological Opinion.²⁴

Finally, even if the appellant were correct in his assertion that the project would result in LS and HSP being hydrologically connected for a greater portion of the year, the appellant has not drawn a link between that assertion and whether the proposed project would result in a significant impact on protected species, water quality, and hydrology.

Accordingly, the appellant fails to demonstrate that the proposed sediment removal in the connecting channel would result in LS and HSP being more hydrologically connected than they are already under baseline conditions or that the proposed sediment removal would result in any significant environmental impacts.

CONCERN 5: The appellant asserts that Sharp Park's ecological history indicates that increased pumping will result in saltwater intrusion. The appellant asserts that the PMND misunderstands LS's ecological history and thus, overlooks significant environmental effects of the proposed project and considers harmful project activities as mitigation measure.

²³ Stacy Bradley, SFRPD. *Email to Kei Zushi, San Francisco Planning Department, Project Description Confirmation*, January 07, 2014. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

²⁴ USFWS. *Biological Opinion*.

“Laguna Salada was never a tidal lagoon, nor was it daily or regularly influenced by ocean waters. The most extensive natural history investigation ever conducted of Sharp Park concludes that Laguna Salada was, under natural conditions, a fresh-to brackish backbarrier lagoon system surrounded by freshwater wetlands, separated from the ocean by a protective dune-like beach system. Lagoons with these structures and ecological characteristics provide suitable habitat for frogs and snakes throughout the state - as did Sharp Park’s lagoons before the berm was completed in the 1980s.” (Pages 8 and 9 of the Appeal Letter)

“Aerial photos from the 1940s through the 1980s indicate that Sharp Park’s berm was not completed until after the mid-1980s. Nonetheless San Francisco gartersnakes were recovering at Sharp Park until the mid-1980s. The City has previously suggested that an ocean storm surge brought high salinity levels to Laguna Salada in 1986 and alone halted this recovery, but this seems unlikely give (*sic*) the fact that Sharp Park’s California red-legged frog and San Francisco gartersnake populations survived ocean storm surges as large or larger in the 1930s, 1950s (see Figure 1), and 1970s. Exhibit I, p. 18-19.” (Page 9 of the Appeal Letter)

“The persistence of both species at Sharp Park through 1986 despite (a) an incomplete sea wall and (b) several coastal storm surges that inundated Sharp Park indicates that declines in the late 1980s are unlikely to be attributable to coastal processes. For example, ‘when aquatic habitat (ponds and streams) is abundant as a result of adequate rainfall, the California red-legged frog can produce large numbers of dispersing young, resulting in an increase in the number of occupied sites. In contrast, the California red-legged frog may temporarily disappear from an area during periods of extended drought.’ Revised Critical Habitat for *Rana Draytonii*, 75 Fed. Reg. 12816 (Mar. 17, 2010). From 1987-1992 California faced a severe drought, and ‘it is possible that the most severe impacts have been on the environment and the fish and wildlife that depend on the rivers for their sustenance.’ Specifically, the drought severely degraded wetland habitats, and endangered species populations declined significantly.” (Pages 9 and 10 of the Appeal Letter)

“This fundamental misunderstanding of Laguna Salada’s ecological underpinnings has led the Department to overlook significant environmental effects of the Pumpouse Project, and to consider harmful project activities as mitigation measures. For example, retaining the sea wall while pumping Sharp Park’s wetlands will exacerbate, not prevent, saltwater intrusion from the Ocean as marine waters are pulled through the existing groundwater (hydrologic) interface with the Ocean, eventually making the entire lagoon inhospitable to California red-legged frogs (ESA-PWA 2011, p. B-13). Moreover, the project’s dredging proposal, rather than improving breeding habitat for listed species, will put them at risk by encouraging listed species to breed in the areas most vulnerable to pumping-induced saltwater intrusion. *Id.*” (Page 13 of the Appeal Letter)

“Given the substantial evidence that the Department’s basic ecological presumptions are flawed--and the resulting significant environmental effects that were ignored or exacerbated because of this flawed presumption--the Department must consider the best available information about Sharp Park’s natural history and ecology, and ensure that the Project is both biologically and ecologically sound through a complete EIR.” (Page 13 of the Appeal Letter)

RESPONSE TO CONCERN 5: The appellant’s statements regarding the natural and ecological history of Sharp Park are not relevant to the analysis of the project’s potential environmental impacts.

Under CEQA, the lead agency is required to compare the existing (or “baseline”) conditions at the project site and in its vicinity to the conditions that would occur due to a project’s construction and operations. This is how the environmental impacts due to a proposed project are identified and analyzed. The baseline conditions are appropriately taken as a snapshot in time when an application for a project is first submitted. There is no requirement under CEQA that the prior history of a site--prior to the baseline condition--be identified or analyzed. Thus, it is not relevant whether or not the PMND describes or analyzes the ecological or natural history of the Sharp Park site.

Additionally, the appellant’s discussion related to the ocean storm surges and seawall is irrelevant to potential impacts resulting from the proposed project because storm surges and the existing seawall are also part of the baseline conditions of the site. Moreover, the appellant fails to present any evidence that the proposed project would increase salinity intrusion into the LS wetland system and/or impact Frog breeding. Finally, as discussed above, the proposed project does not include increased or expanded pumping operations. (Please see Responses to Concerns Nos. 1 and 2 for more detail.)

The appellant implies that there are one or more alternatives superior to the proposed project to protect Frogs at Sharp Park. Under CEQA, a lead agency is required to disclose environmental impacts of a project, but not required to determine whether there are any other alternatives superior to the project when no significant impacts have been identified resulting from the project. See also Response to Concern 15. There is no substantial evidence in the record of the lead agency that warrants preparation of an EIR concerning the proposed project and thus analysis of alternatives to the proposed project is not required.

CONCERN 6: The appellant asserts that the project description should have included the ongoing operation of Sharp Park, including the pumps, and certain uplands restoration work and that failure to include those elements as part of this project’s project description is “piecemealing.”

“The project description for the Pumphouse Project ‘includes elements that are required under a Biological Opinion issued by the U.S. Fish and Wildlife service.’ PMND, p.5. But the project description also segments several of the Biological Opinion’s required elements from the Pumphouse Project. The Department then declares that these segmented elements of the Pumphouse Project are either categorically exempt from environmental review, or includes the element’s effects in the environmental baseline. In either case, the Department is ‘chopping a large project into many little ones . . . which cumulatively may have disastrous consequences.’ *Bozung v. Local Agency Formation Commission* (1975) 13 Cal.3d 263, 283-284. Specifically, the action subject to the Biological Opinion has now been segmented into at least three projects for purposes of CEQA:

(1) a .5 acre upland habitat restoration project that the Department declared categorically exempt from CEQA on August 5, 2013, thus evading environmental review; (2) pumping operations that the Department deems to be a component of the environmental baseline, thus evading environmental review; and (3) the remainder of the Pumphouse Project: which the Department has refused to review through a complete EIR.” (Pages 13 and 14 of the Appeal Letter)

“CEQA forbids such ‘piecemeal’ review of the significant environmental impacts of a project. This rule derives, in part, from Cal. Pub. Res. Code § 21002.1(d), which requires lead agencies to ‘consider[] (sic) the effects, both individual and collective, of all activities involved in [the] project.’ In the instant case, SFRPD declared to the Fish and Wildlife Service just a few months ago that the upland habitat restoration, pumphouse operations, and the rest of the Pumphouse Project was a single action. In response, the Fish and Wildlife Service imposed mandatory terms and conditions on SFRPD in exchange for authorization to kill threatened and endangered species. Those terms and conditions included (1) completing the upland restoration project, (2) operating the pumphouse pursuant to specific protocols, and (3) implementing other terms and conditions four (sic) the Pumphouse’s construction actions. Thus, each of these three projects have been treated as a ‘crucial functional element of the larger project such that, without it, the larger project could not proceed.’ *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70. Indeed, the Biological Opinion expressly states that each element of the project description, reasonable and prudent measure, and each term and condition are ‘non-discretionary,’ and must become ‘binding conditions ... in order for the [take exemption] to apply.’ Biological Opinion, p. 39. Thus, these segmented activities are ‘conditions of approval’ for the Pumphouse Project as a whole, and as such it is improper for the Department to segment these elements of the project and evade stringent environmental review. See *Tuolumne County Citizens for Responsible Growth, Inc. v. City of Sonoma* (2007) 155 Cal App.4th 1214, 1224.” (Page 14 of the Appeal Letter)

“The adverse consequences of this piecemealing is already evident at Sharp Park. Laguna Salada has traditionally been a place for birdwatchers to observe wildlife, and several unique birds have been observed there in recent years. But a few months ago SFRPD removed a fencing project from the Pumphouse Project, and constructed a large fence that eliminated all access to Laguna Salada to watch birds. Similarly, SFRPD attempted to segment a so-called ‘grading’ project for the path along Sharp Park’s berm, but then proceeded to place rip-rap and armoring along the berm, resulting in a stop work order from the Coastal Commission.” (Page 14 of the Appeal Letter)

“If these project had not been piecemealed, informed decisionmaking (sic) with public oversight almost certainly would have prevented these significant environmental effects.” (Page 15 of the Appeal Letter)

RESPONSE TO CONCERN 6: The proposed project has independent utility from the ongoing operation of Sharp Park (including operation of the pumps) and from the upland habitat restoration project previously approved by the SFRPC, and thus is properly considered a separate project under CEQA from those activities.

The appellant asserts that the project description should have included the ongoing operation of Sharp Park, including the operation of the pumps, and certain upland restoration work and that failure to include those elements as part of this project's project description is "piecemealing." Appellant is correct that under CEQA, the lead agency is required to consider the whole of the project in one environmental review and not "piecemeal" what should properly be considered one project into smaller projects, thus minimizing the environmental impacts of the project as a whole. Here, piecemealing has not occurred because the three components raised by appellant—the proposed project, the ongoing maintenance and operations activities at Sharp Park, and an upland restoration project—are properly considered to be separate projects.

The primary question for understanding whether proposed activities should be considered one project or separate projects under CEQA is whether those activities have "independent utility" from each other—in other words, whether they rely on or trigger the need for each other. Here, each of these three components has independent utility from the others. First, as discussed elsewhere in this response, the ongoing maintenance and operation activities at Sharp Park are not only part of the baseline conditions of the environmental setting of Sharp Park, they are currently ongoing and can continue to be conducted whether or not this project is ever constructed and whether or not the previously approved upland habitat restoration project is ever undertaken.

Second, the upland habitat restoration project also has independent utility from both the proposed project and the ongoing maintenance and operation of Sharp Park. The Planning Department issued a Categorical Exemption Determination for the upland restoration project²⁵ and the SFRPC approved the project on August 15, 2013. The upland habitat restoration project consists of restoration of upland habitat within Sharp Park at three locations (totaling 0.5 acres in size): 1) south of HSP in an area with significant radish, mustard and Cape ivy cover; 2) immediately north of HSP in an area dominated by iceplant; and 3) west of LS in an area dominated by iceplant and acacia shrubs. Although the upland restoration project is near the proposed project, the upland project has been conducted outside the waterlines of HSP and LS, and its purpose is to convert portions of Sharp Park to native upland habitat for Frogs and Snakes by removing existing non-native invasive plant species and revegetating the areas with native plant species. The upland restoration work can be conducted whether or not the proposed project goes forward and does not trigger the need for the proposed project. Approval of the upland restoration project did not commit the SFRPD or the City to approving the proposed project. Accordingly, the upland habitat restoration project is properly considered a separate project from the proposed project.

Appellant contends that because the Biological Opinion issued by the USFWS considered the effects of all three components—the ongoing maintenance and operation of Sharp Park, the

²⁵ San Francisco Planning Department. *Sharp Park Upland Habitat Restoration Categorical Exemption*, Case No. 2013.1008E, August 5, 2013. This document is available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

upland habitat restoration project, and the proposed project—in one document and issued one incidental take statement for all three activities, that the City’s environmental review conducted under CEQA should also consider all three components together. But whether the three separate activities were considered together in one document by the USFWS is not the legal standard for determining whether they should be considered one project under CEQA. As discussed above, the standard under CEQA is whether the activities have independent utility from each other, which they do. For these reasons, appellant’s contention that the three activities should be considered one project is not correct under CEQA.

Although the upland restoration work is a separate project from the proposed project, it was inadvertently omitted from the cumulative impacts discussions within the PMND. Accordingly, the PMND has been amended to add discussion of the upland restoration work in its cumulative impacts discussions. Addition of this information and discussion does not otherwise change the analysis or conclusions of the PMND, and all project-level and cumulative impacts remain less-than-significant with mitigation.

CONCERN 7: The appellant asserts that the project is inconsistent with the 1995 and 2006 SNRAMPs.

“From 2005 until 2011, SNRAMPs contained a project-level proposal for Sharp Park’s wetland complex, largely based on PWA’s 1992 Laguna Salada Resource Enhancement Plan. Although public comments suggested RPD should consider restoring habitat over the entire Sharp Park Golf Course area, the City refused to do so, explaining in 2009 that “[s]hould changes to the Sharp Park Golf Course be proposed, they would undergo a separate regulatory review, including CEQA environmental review.” (Page 15 of the Appeal Letter)

“The Pumphouse Project is inconsistent with the 2005 (*sic*) proposed SNRAMPs. The Pumphouse Project will enhance pumping operations at Sharp Park and dredge Sharp Park’s Natural Areas to ease the conveyance of water out of the Laguna Salada wetland complex, into the pumphouse, and ultimately out to sea. None of these activities are proposed in the original SNRAMPs proposal for Sharp Park. The PMND implicitly recognizes that the Pumphouse Project is inconsistent with SNRAMPs, because the Department did not make a consistency finding in the PMND. The Department must therefore be aware that there are significant, unmitigated environmental effects from this inconsistency, and the Department must therefore conduct further environmental review.” (Page 15 of the Appeal Letter)

RESPONSE TO CONCERN 7: The proposed project is consistent with the 1995 SNRAMPs. The 2006 SNRAMPs is currently undergoing environmental review and has not been adopted; however, the proposed project is not inconsistent with the as-yet-unapproved 2006 SNRAMPs.

Section C of the PMND, discusses the proposed project’s consistency with adopted and applicable plans and policies, as they relate to physical environmental impacts. The Pumphouse Project is consistent with the adopted 1995 SNRAMPs as it conforms with three of the overall Program

Objectives: 1) determine management needs for natural resources, particularly those identified by other agencies as rare, threatened or endangered; 2) consult and coordinate with other city departments, agencies and groups with special expertise for implementation strategies; and 3) implement measures designed to address immediate problems. The proposed project was created in consultation with USFWS, USACE and CDFW to protect Frogs and Snakes while also implementing measures to improve the safety of workers around the pumphouse.

The project is also consistent with the following 1995 SNRAMP's General Policies and Management Actions listed under Vegetation, Wildlife, and Water Resources: 1) vegetation, by promoting indigenous plant species around the new pond, enhancing riparian areas in the connecting channel and HSP and preserving habitat which supports wildlife; 2) wildlife, by consulting with agencies such as the USFWS, USACE, and CDFW on habitat enhancement for Frogs and Snakes; and 3) water resources, by maintaining and improving the water quality of the connecting channel and HSP and protecting this riparian zone from sedimentation. As such, this project is consistent with the 1995 SNRAMP.

Appellant is correct that a consistency statement was not included in the PMND's discussion of the 1995 SNRAMP. Accordingly, the PMND has been amended to include a statement that no inconsistencies with the 1995 SNRAMP were identified.

The proposed 2006 SNRAMP is currently undergoing environmental review and has not yet been adopted by the SFRPC. Although it would be premature to make an ultimate determination regarding whether the proposed project is consistent with the as-yet-unadopted policies of the proposed 2006 SNRAMP, no inconsistencies with the current draft were identified. Like the 1995 SNRAMP, the objectives of the proposed 2006 SNRAMP are to inventory the biological resources of the SFRPD's natural areas, to identify issues and impacts concerning habitats, biological diversity, and populations of sensitive species, to identify and prioritize restoration, management and monitoring activities, and provide guidelines for passive recreational use of the natural areas and for educational, research, and stewardship programs.²⁶ The proposed project is consistent with the objectives of the proposed 2006 SNRAMP because the primary purpose of the proposed project is habitat restoration and enhancement, as well as worker safety.

CONCERN 8: The appellant asserts that Mitigation Measure M-BIO-2a proposed to be implemented in the PMND is not sufficient to protect Frogs.

"The primary mitigation measure proposed is M-BIO-2A, which would require SFRPD to disturb sediments outside of the California red-legged frog breeding season. But this is not a sufficient mitigation measure for this threat. First, California red-legged frog tadpoles are known to overwinter before metamorphosing under certain conditions. Exhibit K, p. 2. Thus, it is likely that

²⁶ SFRPD. *Significant Natural Resources Management Plan, February 2006, Executive Summary*, page 1. This document is available online at: <http://sfrecpark.org/parks-open-spaces/natural-areas-program/significant-natural-resource-areas-management-plan/snramp/>.

tadpoles and other sensitive receptors will be present during the dredging activity, even during the frog's non-breeding season. Second, oxidative formation of acid sulfates is a relatively lengthy process: it can take many days or weeks to occur, and therefore there is no indication in the mitigation measure that there is an adequate buffer to ensure acid sulfates disturbed towards the end of the construction period do not affect breeding frogs." (Pages 15 and 16 of the Appeal Letter)

RESPONSE TO CONCERN 8: Mitigation Measure M-BIO-2a would reduce the potential impacts to Frogs and Snakes to a less-than-significant level. Mitigation Measure M-BIO-2a not only limits the construction period to June 1 through October 31 in accordance with the Biological Opinion issued by the USFWS, but also includes a number of measures to protect adult Frogs and tadpoles. These measures include pre-construction avoidance and survey tasks, site monitoring by USFWS/CDFW-approved biologists during construction activities, limitation on vehicle speeds in the project area, erosion control measures, etc.

The PMND found that Mitigation Measure M-BIO-2a, along with other elements of the proposed project and its mitigation measures, would reduce the proposed project's impacts to biological resources, including Frogs and Snakes, to less-than-significant levels. Mitigation Measure M-BIO-2a not only limits the construction period to June 1 through October 31, which is outside the primary breeding season for Frogs, to minimize the proposed project's impact to Frogs and Snakes in accordance with the Biological Opinion, but also includes a number of measures to protect Frogs and Snakes as outlined on pages 74 through 76 of the PMND (pages 80 through 82 of the amended PMND). The PMND found that the proposed project's potential impacts to Frogs and Snakes would be reduced to a less-than-significant level with implementation of identified mitigation measures including Mitigation Measure M-BIO-2a

The appellant asserts that acid sulfates may stay in the water column after the proposed sediment and vegetation removal is completed. *In the event that acidification is detected to a degree harmful to special-status species*, to ensure that residual acid sulfates in the water column would not adversely impact special-status species, Mitigation Measure M-BIO-2b has been revised to require monitoring of water quality for a period of six weeks after the proposed sediment and vegetation removal is completed. These revisions to the mitigation measure do not otherwise change the analysis or conclusions of the PMND and are equally or more effective than the mitigation measure prior to revision and would not themselves cause a significant effect on the environment. As such, the proposed project's impact to biological resources and water quality remains less than significant with mitigation.

CONCERN 9: The appellant asserts that Mitigation Measure M-BIO-2b proposed to be implemented in the PMND is a deferred and unenforceable mitigation measure.

"The Department has also proposed a deferred, byzantine, and ultimately unenforceable mitigation proposal called Mitigation Measure M-BIO-2B to address significant effects of disturbed oligohaline sediments. The measure proceeds through a voluntary, non-binding, multi-

step assessment process. As a preliminary matter, the deferral of mitigation until this process is complete is holy (*sic*) unnecessary, because it is indisputable that oligohaline sediments are present in the Laguna Salada wetland complex. The process eventually concludes with three possible remediation outcomes: addition of lime to the wetland complex, the injection of sodium nitrate into the wetland complex, or the use of suction dredging to reduce the rate of re-suspension of oligohaline sediments.” (Page 16 of the Appeal Letter)

“However, mitigation measure M-BIO-2B is not fully enforceable, and therefore is not adequate to mitigate the significant environmental effects of oligohaline soils. The Department must ensure that ‘measures to mitigate or avoid significant effects on the environment are fully enforceable through permit conditions, agreements, or other measures.’ CEQA Guidelines § 21081.67(b). (*sic*) is not fully enforceable. Public agencies therefore may not defer mitigation measures unless the agency commits itself to mitigation and articulates specific performance criteria or standards that must be met for the project to proceed. *Endangered Habitats League, Inc. v. County of Orange* (2005) 131 Cal.App.4th 777, 793-794. The Department has failed to meet both criteria here. First, there is no commitment to mitigation within the meaning of CEQA. Nowhere does the mitigation measure specify that an authoritative body will mandate the mitigation measures through a permit, agreement, or other measure. Instead, the measure relies upon voluntary reviews and comments throughout the mitigation process. While the fourth (*sic*) and fifth stage of the measure (Toxic Pathways Analysis and Remediation) suggest that either the U.S. Fish and Wildlife Service or the California Department of Fish and Wildlife will ‘approve’ SFRPD’s toxicity standards or its remediation measures, the Department does not identify any permit, agreement, or other measure that could in fact serve as the vehicle for these approvals.” (Page 16 of the Appeal Letter)

“The explanation of sulfur oxidation-reduction sediment biogeochemistry on page 96 of the MND (water quality) is essentially accurate, but it is inconsistent with the utterly confused explanation on pp. 76-77 of the MND, which garbles hypoxia, pH, and inconsistent oxidation-reduction states associated with aerobic and anaerobic sediments. Acid sulfates are the oxidized forms of sulfur compounds, not the reduced forms (sulfides) associated with hypoxia and anoxia. The temporary suspension of anoxic iron sulfide-rich sediment, and free hydrogen sulfide (rotten egg scent) in the water column is the cause of acute hypoxia. Oxidative formation of acid sulfates and iron oxides is a slow process occurring over many days or weeks in aerobic conditions. The MND argues on p. 77 that since no acid sulfate conditions were detected in the last episode of dredging 10 years ago, the impact is unlikely. This is utterly fallacious, since no measurements of soil sulfate levels or pH were sampled. An even more ludicrous fallacy on p. 77 is the exclusion of tidal flows precludes the existence of sulfur sources in sediments. Obviously, if salinity range is up to 2.5 ppt, and the only original salinity source is seawater, sulfates (the second most abundant anion in seawater) is present in the oligohaline sediments. Moreover, I provided direct observation of both iron sulfide and hydrogen sulfide in near-surface anoxic sediments of the exposed bed of Laguna Salada in the ESA-PWA report (ESA-PWA 2010). Strongly sulfidic sediments are ubiquitous and conspicuous throughout the lagoon complex, and readily detectible by any qualified wetland ecologist who looks for them. It is disingenuous of the MND, as well as flatly incorrect, to assert that they are ‘unlikely’.” (Page 4 of Peter Baye’s Comment Letter)

“Proposed mitigation M-Bio-2b fails as a CEQA mitigation measure because it provides no objective chemical standard or biological criteria or threshold for sulfide concentrations, pH, Biological Oxygen Demand (a measure of hypoxia in the suspended sediment plume around dredging sites), or redox thresholds for significant biological impacts. It instead relies on purely subjective voluntary submittal of data (not evidence of actual consultation and reply!) with resource agencies, with no evidence that resource agencies have staff resources or commitments to comply with the mitigation measure. The mitigation measure is vague, programmatic, and unenforceable. Dredge sediments are routinely sampled for aquatic impacts throughout the San Francisco Bay area. It is seldom that dredging occurs in nontidal wetlands with endangered species (for good reason), but the analytic methods for assessing aquatic impacts of hypoxic sediment plumes during dredging are established. They are not cited by the MND. Nor does the MND show any evidence of consultation with the RWQCB – SFB for appropriate dredge sediment and water quality protocols adapted to the distinctive setting of Laguna Salada, including specific criteria for water column hypoxia and sulfide toxicity during dredging. Hypoxia and sulfide toxicity are not the same chemical phenomenon, even though they are physically related by suspension of reduced iron sulfide-rich sediment. The MND is deficient in basic understanding of acid sulfate soils, sulfur oxidation-reduction sediment processes, and ecotoxicity. Below is a limited sample of relevant scientific literature to support improved understanding.” (Page 4 of Peter Baye’s Comment Letter)

“Moreover, the PMND suggests that discharges from Sharp Park’s pumphouse are authorized under an existing San Francisco Bay Region Water Quality Control Board Permit. However, no such permit exists, so it will not be possible to make any provision of this mitigation measure binding through an amendment of any existing permit. Similarly (*sic*), the Army Corps of Engineers--the action agency for the Pumphouse Projects Section 7 Consultation--to date still has not agreed to incorporate the Biological Opinion into a wetland fill permit issued to SFRPD for this project. Unless and until the Army Corps of Engineers agrees to be bound by the Biological Opinion and incorporate the terms of the Biological Opinion into non-discretionary permit terms, the Army Corps cannot provide the fully enforceable permits or measures that would be necessary to make this mitigation measure lawful.” (Page 16 of the Appeal Letter)

“Second, the mitigation measure does not articulate specific performance criteria or standards that must be met for the project to proceed. There are no thresholds of significance identified, and no other specific measure that would alert the agency or any member of the public that a performance criterion had not been met. Instead, the mitigation measure orders study after study to occur, but leaves the actual triggers for remediation and the remediation objectives completely undefined” (Pages 16 and 17 of the Appeal Letter)

RESPONSE TO CONCERN 9: Although it is unlikely that hypoxic conditions would result from the proposed project’s sediment removal, as a conservative approach, Mitigation Measure M-BIO-2b was included and was developed based on the best available science to address such an effect in the event it did occur. Mitigation Measure M-BIO-2b is enforceable and would

reduce the project's potential impacts to listed species and water quality to a less-than-significant level.

The PMND found that it would be unlikely for hypoxic conditions to occur during the proposed sediment and emergent vegetation removal because: 1) when sediment was previously removed from the connecting channel approximately 10 years ago, no effects that would normally be associated with acid sulfate soils, including acidification of waters and sediment surfaces, were identified; 2) the sediment to be removed as part of the proposed project has only accumulated since the last removal activity, which would have removed all the sediment that accumulated before the current seawall was constructed, and therefore has accumulated without the saline conditions that allow acid sulfate soils to form; and 3) the Biological Opinion concluded that the proposed project would not jeopardize the continued existence of Frogs or Snakes with the implementation of the Conservation Measures included in the Biological Opinion (see pages 76 through 78 of the PMND, or pages 82 through 84 of the amended PMND).

Nevertheless, in order to mitigate such conditions in the unlikely event that they do occur, Mitigation Measure M-BIO-2b was incorporated. Mitigation Measure M-BIO-2b requires soil sampling tests prior to commencement of the proposed sediment and vegetation removal and review of the results of such soil sampling tests by regulatory agencies including the USFWS, CDFW, and any other applicable responsible agencies. If soil sampling shows that acid sulfate soils could be present and/or that there is the potential for anoxic conditions in the water column, then the mitigation measure requires SFRPD to perform a “toxic pathways analysis” to determine the appropriate remediation measures. As described on page 78 of the PMND (page 84 of the amended PMND), the toxic pathways analysis method for analyzing the potential for bioaccumulation of toxics in the environment is an approach recommended by the USEPA for determining risk to wildlife and plants. Pathways analysis is used to determine environmental conditions that would mobilize toxics and increase exposure that could have chronic or acute effects. If this analysis indicates the potential for reduction of sulfate to form hydrogen sulfate, iron sulfides, and its reduction in buffering capacity relative to acid-neutralizing capacity, or if the toxics pathways analysis indicates that their presence could potentially result in substantial stress to special-status species, the mitigation measure requires SFRPD to implement remediation measures, as approved by the USFWS and CDFW. Finally, this mitigation measure describes specific remediation measures that would be undertaken, depending on the conditions found through pre-construction testing, that would mitigate this impact to a less-than-significant level.

Thus, this mitigation measure--requiring testing, toxic pathways analysis (the methodological approach recommended by the USEPA), review and approval by federal and state regulatory agencies, and implementation of specific remediation measures, which measures are described in the mitigation measure--would ensure that the proposed sediment and vegetation removal would not result in any significant impact to Frogs or Snakes. This is not deferred mitigation within the meaning of CEQA. The mitigation measure requires that testing be conducted before construction occurs, it identifies the required methodology as recommended by the USEPA, and requires implementation of remediation measures if certain levels of toxicity are identified—i.e. if the

analysis indicates the potential for reduction of sulfate to form hydrogen sulfate, iron sulfides, and its reduction in buffering capacity relative to acid-neutralizing capacity, or if the analysis indicates that their presence could potentially result in substantial stress to special-status species. The mitigation measure establishes a performance standard that if the results of the sediment core tests conducted as part of the pathways analysis reveal that there has been an appreciable increase in the amount of nitrogen and related compounds in the sediment cores, all necessary measures to remediate such compounds shall be undertaken. The mitigation measure additionally requires approval of all remediation measures by the USFWS and CDFW before any work can be done and describes a list of possible remediation measures that would likely be required. Thus, this mitigation measure complies with CEQA's requirement that "[mitigation] measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way." CEQA Guidelines Section 15126.4(a)(1)(B).

This project is proposed to be approved and constructed by CCSF, through SFRPD. If approved, the project will be approved at a public hearing by the SFRPC, which would also adopt a mitigation monitoring and reporting program (MMRP) for the project as a condition of project approval. This MMRP will include all of the mitigation measures adopted by the SFRPC and will allocate responsibility for implementing, monitoring, and reporting on compliance with all the mitigation measures amongst the appropriate local, state, and federal entities. If the project is approved, the proposed mitigation measures will be adopted as conditions of approval on the project and will be fully enforceable by the appropriate regulatory entities.²⁷

CONCERN 10: The appellant asserts that one of the potential remediation measures under Mitigation Measure M-BIO-2b, specifically suction dredging, will likely cause new and significant environmental effects.

"..., at least one of the remediation measures--suction dredging--will likely cause new and significant environmental effects if it is implemented. Suction dredging will remove large amounts of both sediment and water from the wetland complex--much more than the clam shell or bucket type dredging equipment identified in the project description, which typically contain 80-90% solids. Suction dredging will require distinct technologies to dispose of watery dredged materials: it would not be permissible to allow these waters to drain back into the wetland complex given that they are likely acidic or hypoxic to begin with. Yet the PMND does not discuss any proposed mitigation measure for suction dredging: CEQA requires at least some discussion

²⁷ The PMND (on pages 18 and 96) states that discharges from Sharp Park's pumphouse are authorized under an existing NPDES permit. This is incorrect and has been corrected where it occurred. No permit is required for discharges from Sharp Park's pumphouse into the Pacific Ocean because both the LS wetlands complex and the Pacific Ocean are considered "waters of the United States" under the federal Clean Water Act. As such, as long as nothing is added to the water, no permit is required to discharge from one water of the U.S. to another. Should any permit be required by the SFBRWQCB for the proposed project, SFRPD will seek such a permit and comply with any conditions that may be attached to the permit.

in situations such as this. *Stevens v. City of Glendale* (1981) 125 Cal.App.3d 986.” (Page 17 of the Appeal Letter)

RESPONSE TO CONCERN 10: The PMND has been modified to include a discussion and analysis of potential impacts resulting from the use of suction hydraulic equipment as part of the proposed sediment removal work. The use of suction hydraulic equipment, if used as part of the proposed sediment and vegetation removal, would not result in any significant impact on the environment.

As discussed on page 7 of the PMND (page 7 of the amended PMND), to facilitate the proposed sediment and emergent vegetation removal and to reduce potential impacts to Frogs, suction hydraulic equipment may be used in consultation with the USFWS to minimize the disturbance of sediments in the water. While generally resulting in a higher percentage of water in the excavated materials than a clamshell dredge, the use of suction hydraulic equipment generally results in less turbidity and overall disturbance at the point of use than a clamshell. In sensitive environments, the use of suction hydraulic equipment is often preferred provided that the excavated materials and residual water are properly handled so they do not result in a significant impact on the environment. If suction hydraulic equipment is to be used as part of this project, the slurry that is created by suction hydraulic equipment would go into a settling area until the sediments settle out and the decant water can be tested for its acidity. If the result of such testing indicates that the water is pH neutral, it would either be released into HSP or pumped into the Pacific Ocean.^{28,29} Should any permit be required by the SFBRWQCB for the discharge of the water into the Pacific Ocean as part of this project, SFRPD will seek such a permit and comply with any conditions that may be attached to the permit.

In light of the above, the use of suction hydraulic equipment as part of the proposed sediment and vegetation removal would not result in any significant impact on the environment.

CONCERN 11: The appellant asserts that the project is inconsistent with the California Coastal Act (CCA).

“The Coastal Act, as well as Pacifica Zoning Code Section 9-4.4302, defines an ‘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 activity or developments.’ The Act states that ‘[e]nvironmentally sensitive habitat areas shall be protected against any significant disruption of

²⁸ David Munro, Tetra Tech. *Email to Stacy Bradley, SFRPD, Feedback on MND Appeal*, November 26, 2013. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

²⁹ David Munro, Tetra Tech. *Email to Stacy Bradley, SFRPD, Revised Text*, November 26, 2013. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

habitat values, and only uses dependent on those resources shall be allowed within those areas.”
(Page 17 of the Appeal Letter)

“Sharp Park constitutes an ESHA under this definition because both the CRLF and SFGS are rare, and their presence is regularly documented at Sharp Park; because Sharp Park’s habitats are both rare and especially valuable to these species, because they constitute a rare coastal lagoon ecosystem that is the northern-most known habitat for the SFGS; and because the species and their habitats are disturbed and degraded under existing conditions, and the Project will cause additional degradation and disturbance.” (Page 17 of the Appeal Letter)

“However, the PMND does not recognize ESHA at Sharp Park, nor any of the implications this status has on the Pumphouse Project. Therefore fails to ensure that the Pumphouse Project is consistent with the Coastal Act.” (Page 17 of the Appeal Letter)

RESPONSE TO CONCERN 11: The project is consistent with the California Coastal Act (CCA).

The project’s consistency with the CCA is addressed on pages 19, 21, and 22 of the PMND (pages 19 and 22 of the amended PMND). The CCC has the authority to designate an Environmentally Sensitive Area under the CCA. The appellant has not presented any evidence that the CCC has designated any portion of the project site or Sharp Park as an Environmentally Sensitive Area as defined in CCA Section 30107.5. Even if a portion of the project site were designated by the CCC as an environmentally sensitive area, the appellant has not demonstrated how the proposed project is inconsistent with the CCA.

The PMND acknowledges that a portion of Sharp Park near the LS wetland complex is in the Coastal Zone under the CCC jurisdiction (see page 22 of the PMND, or page 22 of the amended PMND). The majority of the project activities would take place entirely within the CCC jurisdiction and require a coastal development permit from the CCC. SFRPD is seeking a coastal development permit from the CCC and will comply with any conditions that may be attached to the permit. This will ensure that the project is consistent with the CCA.

The primary objective of the CCA is the protection of wetlands and other environmentally sensitive habitats, water quality, public access and recreation, low cost visitor facilities, and the scenic and visual qualities of coastal areas and the control of coastal erosion and other hazards. The primary purposes of the proposed project are to: 1) restore habitat in several locations within the wetland complex for Frogs and Snakes; and 2) improve the safety conditions of workers operating and maintaining the pumps by enhancing access to the pump intake structure.

As discussed on page 22 of the PMND (page 22 of the amended PMND), the proposed project would not restrict access to or within Sharp Park and would not affect low cost visitor facilities. As discussed in Section E.2, Aesthetics, none of the project elements would result in a significant impact to the visual quality of the nearby coastal areas. The proposed project would involve improvements to an existing pumphouse and habitat for Frogs and Snakes. The project would be

subject to various mitigation measures to protect wetlands and other environmentally sensitive habits and water quality and minimize soil erosion and other hazards that could result from the proposed project (see Sections E.13, Biological Resources, E.14, Geology and Soils, E.15, Hydrology and Water Quality, and E.16, Hazards and Hazardous Materials in the PMND, for more information).

In light of the above, the proposed project would be consistent with the CCA.

CONCERN 12: The appellant asserts that the project is inconsistent with the Frog recovery plan.

“The Sanchez Creek Watershed is a Priority 2 watershed for CRLF recovery. Priority 2 Watersheds provide the necessary habitat connectivity between core areas and is an important contribution to the recovery of the California red-legged frog throughout its range. These watersheds have Watershed Management and Protection Plans that address, among other things, restoration, controlling water flow, assess suction dredging impacts on water quality and thus the frog (sedimentation increases are cited as a possibility), flood control activities, and recreation activities. Recovery Plan p. 53. The PMND makes no mention of this planning process at all.” (Page 17 of the Appeal Letter)

RESPONSE TO CONCERN 12: The project is consistent with the Frog recovery plan.

The appellant claims that the Sanchez Creek Watershed is a Priority 2 Watershed for Frog recovery. However, the appellant has presented no documentation prepared by the USFWS or other regulatory agency supporting the claim. Furthermore, the appellant has not demonstrated how the proposed project is inconsistent with the Frog recovery plan.

The PMND acknowledges that a recovery plan was published for Frogs on September 12, 2002 (see page 68 of the PMND, or page 74 of the amended PMND). The recovery plan approved by the USFWS notes that the objective of the recovery plan is to delist Frogs. The recovery plan further states that the strategy for recovery of Frogs will involve: 1) protecting existing populations by reducing threats; 2) restoring and creating habitat that will be protected and managed in perpetuity; 3) surveying and monitoring populations and conducting research on the biology of and threats to the subspecies; and 4) reestablishing populations of the subspecies within its historic range.

One of the primary purposes of the proposed project is to restore and enhance habitat within the wetland complex for Frogs (see page 6 of the PMND, or page 6 of the amended PMND). In addition, the Biological Opinion prepared by the USFWS found that the proposed project would not jeopardize the continued existence of Frogs or Snakes (see page 38 of the Biological Opinion). As such, the proposed project is consistent with the Frog recovery plan. The PMND has been amended to include a discussion concerning the Frog recovery plan.

CONCERN 13: The appellant asserts that a golf course redevelopment project is interrelated with this project and should be analyzed as part of this project’s environmental review.

“E. THE GOLF COURSE REDEVELOPMENT PROJECT IS A PROJECT LEVEL CEQA DOCUMENT, AND DOES NOT MERELY GUIDE MANAGEMENT AT SHARP PARK.” (Page 18 of the Appeal Letter)

“The City’s plan to reconstruct Sharp Park Golf Course is reasonably certain to occur, will adversely affect Sharp Park, and is interrelated with this proposal: it’s (*sic*) effects must therefore be assessed as part of this CEQA process. However, throughout the PMND, the Department suggests that this project level review will merely ‘guide’ management at Sharp Park in the future. This is a significant error, and indicates that the Department must reassess the interrelatedness of these projects and consider them as one project.” (Page 18 of the Appeal Letter)

“The City’s Golf Course Construction Plan Has Been Significantly Changed.” (Page 18 of the Appeal Letter)

“In 2009, the San Francisco Board of Supervisors unanimously passed an ordinance ordering RPD to study restoration alternatives at Sharp Park. The report RPD ultimately released contained a radical new golf course construction plan for Sharp Park guised as a ‘recovery’ effort for listed species (TetraTech 2009).” (Page 18 of the Appeal Letter)

“After scientists criticized the plan’s several significant flaws (Davidson et al. 2011, pp. 1-2), the City convened the fact-finding Sharp Park Working Group (Holland 2011, p. 4-5). When the Working Group released findings that adopted many of (ESA-PWA 2011) recommendations, RPD announced it would abandon a core element of its golf course construction plan--armoring Sharp Park’s seawall--but continued to insist that Sharp Park’s 18-hole golf course would remain in its historic footprint, even as it acknowledged that sea level rise will erode the seawall and force it inland, squeezing endangered species habitats in a narrow area between the golf areas and the advancing ocean (Holland 2011, pp. 4-5).” (Page 18 of the Appeal Letter)

“Contemporaneously the City was preparing a Draft Environmental Impact Report (‘DEIR’) for the City’s Significant Natural Resource Areas Management Plan (‘SNRAMP’).” (Page 18 of the Appeal Letter)

“However, when the DEIR was released in 2011 the PWA-based Laguna Salada plan had been replaced with the TetraTech golf course construction plan. Under this plan, 60,000 cubic yards of material would be dredged from the Laguna Salada’s wetland complex, creating 12,100,000 gallons of water storage capacity (PRD 2011, p.99). Four golf links surrounding Laguna Salada would be raised by up to 3.5 feet, creating additional (although unquantified) water storage capacity in the lagoon system (TetraTech 2009, p. 43). Another link would be narrowed, and another removed (RPD 2011, Figure 3). It also calls for filling 1/2 acre of Sharp Park’s wetlands to create an island in Laguna Salada (RPD 2011, p. 99) and landfilling areas where California red-

legged frogs breed to ‘prevent localized ponding’ and ‘to allow more complete drainage to Laguna Salada” (RPD 2011, p. 377).” (Pages 18 and 19 of the Appeal Letter)

“The Golf Course Construction Plan and the Project are Interrelated.” (Page 19 of the Appeal Letter)

“The DEIR’s golf course construction project is interrelated with the proposal here. Both are designed to reduce golf course flooding, and depend upon each other to implement this larger action. The City’s larger plan to reduce golf course flooding is composed of (1) ensuring maximum pump rates are reliably achieved, (2) increasing water flow rates towards the pumps, (3) increasing water storage capacity by deepening lagoons and (4) increasing storage capacity by elevating the rim of the lagoon. If any one of these components fails or is not achieved, pumping rates will decrease and golf course areas will flood.” (Page 19 of the Appeal Letter)

“While there is some overlap, this project is primarily designed to accomplish the first and second elements of this plan (RPD 2012, p.6) while the DEIR is primarily designed to implement the third and fourth elements of the plan (RPD 2011, p. 99). But the elements are expressly interlinked: the DEIR repeatedly states that the golf course construction project is dependent on efficient pump operations (RPD 2011, pp. 146, 361, 374, 377), and further explains that the golf course construction plan is designed to meet flood control objectives while reducing wear-and-tear on the pumps (TetraTech 2009, p. 43).” (Page 19 of the Appeal Letter)

“The City’s statement that the golf course construction plan is wholly separate from the Project (Wayne 2011b, p. 2) is belied by its recent permitting strategy discussion with other agencies (Anonymous 2012, p. 1). The agenda from this discussion indicates the Project and the golf construction project are two temporal phases of a single management strategy. Effects from the later phases are classic indirect effects, because they are caused by the proposed action and are later in time, but still reasonably certain to occur. They also derive, either directly or indirectly from an interrelated element of the City’s larger flood management strategy. In either case, by law the City must review these effects during this CEQA process, regardless of the City’s colloquial assertion that the projects are separate.” (Page 19 of the Appeal Letter)

“The Golf Course Construction Plan is Reasonably Certain to Occur.” (Page 19 of the Appeal Letter)

“The City’s proposal has already been approved by several oversight bodies, and in each case the City made clear that it would not review or consider restoration alternatives at Sharp Park. The City’s single-minded approach to Sharp Park and its completion of many steps in its approval process show that the golf course construction project is reasonably certain to occur.” (Page 19 of the Appeal Letter)

“The City’s proposal to rebuild Sharp Park Golf Course’s original layout was endorsed by San Francisco’s Recreation and Parks Commission in December of 2009, to the exclusion of all other

options for Sharp Park’s future (RPD 2011, p. 2). In the SNRAMP DEIR, the City concluded that only an 18-hole Golf Course at Sharp Park was a feasible alternative for the property, and refused to consider other restoration options that would provide additional benefits to listed species (RPD 2011, p. 3). Moreover, the DEIR contains a mitigation requirement that will force the City to rebuild a golf link in one of two places in subsequent environmental review (RPD 2011, p.28). Thus, the City’s existing approvals and contemporaneous permitting procedures create a binding requirement to implement the golf course construction plan.” (Page 20 of the Appeal Letter)

“Furthermore, when the San Francisco Board of Supervisors passed an ordinance requiring the City to negotiate with the National Park Service to implement a restoration plan for the property, the Mayor vetoed the ordinance (Lee 2011, p. 1) again indicating the City’s intent to ensure the golf course construction project occurs. And with the City’s encouragement, San Mateo County passed a resolution calling for San Francisco to ‘maximize recreation opportunities’ at Sharp Park by implementing the golf course construction plan (San Mateo Co. 2011, p.2).” (Page 20 of the Appeal Letter)

“These actions by the City are all that is necessary to show that the golf course construction plan is reasonably certain to occur. While there may be some ambiguity about what the ultimate Golf Course design may be the City’s CEQA documents must give consideration of the effects of interrelated and interdependent activities whether or not all of the activities’ impact is known.” (Page 20 of the Appeal Letter)

RESPONSE TO CONCERN 13: The only reasonably foreseeable future project in Sharp Park that would involve modification of the layout of the Sharp Park Golf Course is described in the proposed 2006 SNRAMP, which is a separate project from the proposed project and which is adequately analyzed in the PMND in the cumulative context.

It is not clear what the appellant is referring to as the “Golf Course Redevelopment Project,” or the “Golf Course Construction Plan.” SFRPD and Planning Department staff are not aware of any projects referred to as the “Golf Course Redevelopment Project,” or the “Golf Course Construction Plan.”

There is a report titled “Sharp Park Conceptual Restoration Alternative Report,” dated November 2009, and prepared by Tetra Tech, Swaim Biological, and Nickels Golf Group (“Sharp Park Restoration Report”) for SFRPD. This report lays out multiple options for the restoration of the LS wetland complex at Sharp Park, but makes no recommendations or commitment to any one of the options. On December 17, 2009, the SFRPC passed resolution 0912-018, which recommends proceeding with the LS Restoration and maintaining the 18-hole golf course. Therefore, some project elements that originate from the Sharp Park Restoration Report have been incorporated into the proposed 2006 SNRAMP and are being analyzed in the SNRAMP DEIR. These project elements are discussed on pages 97 through 104 of the DEIR and have been considered here in the PMND in the cumulative impacts analysis. The proposed project does not favor or preclude any of the options in the Sharp Park Restoration Report. As of this writing there are no elements in the

Sharp Park Restoration Report, except for those that have been incorporated into the proposed 2006 SNRAMP, that are considered to be a reasonably foreseeable future project under CEQA.

The only reasonably foreseeable future project in Sharp Park that would involve modification of the layout of the Sharp Park Golf Course is described in the proposed 2006 SNRAMP (see pages 97 through 104 of the SNRAMP DEIR). The proposed 2006 SNRAMP, including modifications to the layout of the Sharp Park Golf Course that would occur as a result of implementation of the SNRAMP, is a separate project from the proposed project and is currently undergoing environmental review. The PMND addressed the proposed 2006 SNRAMP and all other project elements analyzed in the DEIR as a reasonably foreseeable future project at Sharp Park in the cumulative impact section under each of the environmental topics addressed in the PMND and found that the proposed project would not make a considerable contribution to any cumulative impacts.

The appellant has presented no evidence that the proposed project, in combination with the 2006 SNRAMP or any other cumulative project, could result in significant impacts on the environment.

In light of the above, there are no other cumulative projects, than those addressed in the PMND, that are required to be analyzed as part of the environmental review for the proposed project.

CONCERN 14: The appellant asserts that the PMND fails to address the cumulative impacts – or any impacts at all - on Snakes.

“The Pumphouse Project PMND fails to address the cumulative impacts--or any impacts at all--on the San Francisco garter snake, which has been greatly impacted by the golf course for many decades. This is particularly troubling given Sharp Park’s role in the recovery of the species, and SFRPD’s failure to aid in that recovery.” (Page 20 of the Appeal Letter)

RESPONSE TO CONCERN 14: The PMND fully addressed the proposed project’s potential impacts to Snakes, both individually and cumulatively.

The appellant implies that impacts to Snakes resulting from the ongoing operations of the existing golf course are required to be analyzed as part of the environment review for this project. The ongoing operations of the golf course are considered to be a baseline condition for the purpose of environmental review for this project, similar to the ongoing operations of the existing pumps at HSP (see Response to Concern 2). No changes at all are proposed to the operations of the golf course. As such, no impact analysis is required concerning the ongoing operations of the golf course because that is part of the baseline conditions of the project site.

The PMND addressed the proposed project’s potential impacts to Snakes under Impact BIO-2 (see pages 73 and 74 of the PMND, or pages 79 and 80 of the amended PMND). The PMND also addressed the project’s potential cumulative impacts to special-status species including Snakes under Impact C-BIO (see page 90 of the PMND, or page 97 of the amended PMND). The PMND

found that the proposed project with identified mitigation would not result in any significant impacts to special-status species including Snakes.

The impact analysis concerning Snakes in the PMND is based on the findings in the Biological Opinion (see pages 30 and 31 of the Biological Opinion) and summarized below. The effects of the construction activities to wetland and upland habitat and to individual Snakes would be throughout the 0.624-acre construction footprint. Injury, exposure disorientation and disruption of normal behaviors would likely result from: 1) excavation of sediments and vegetation as part of the golf cart path realignments; 2) the removal and/or disturbance of vegetation, sediments, and cover sites including animal burrows, boulders or rocks, organic debris such as downed trees or logs in HSP and the connecting channel; 3) construction of a maintenance walkway around the pump house at HSP; and 4) soil disturbance and fill associated with replacement of the wooden retaining wall with a concrete retaining wall at HSP. Construction noise, vibration, and increased human activity during the construction period may interfere with normal behaviors such as feeding, sheltering, movement between refuge and foraging grounds, and other essential behaviors. This can result in avoidance of areas that have suitable habitat and can cause disturbance to the species. Direct effects could include injury or mortality from being crushed by earth moving equipment, construction debris, and worker foot traffic. Work activities, including noise and vibration, may result in adverse effects to Snakes by causing them to leave the work area. This disturbance may increase the potential for predation and desiccation.

The Biological Opinion concluded that the proposed project would not be likely to jeopardize the continued existence of Snakes with implementation of conservation measures included in the Biological Opinion. These conservation measures, along with the applicable Terms and Conditions included in the Incidental Take Statement, would minimize the likelihood of potential for take of individual Snakes and are included in Mitigation Measure M-BIO-2a.

The PMND also addressed potential impacts to Snakes resulting from the potential disturbance of acid sulfate soils in the water during the proposed sediment and vegetation removal in HSP and the connecting channel and culverts that link HSP and LS (see pages 76 through 78 of the PMND, or pages 82 through 84 of the amended PMND). Based on the literature review and empirical evidence concerning similar sediment removal that was conducted more than 10 years ago in the connecting channel between HSP and LS, the PMND found that the proposed sediment and vegetation removal would not likely result in substantial disturbance of acid sulfate soils in the water column, resulting in a significant impact to special-status species. Nevertheless, as a conservative measure, Mitigation Measure M-BIO-2b was included. See also Response to Concern 9.

The PMND found that implementation of Mitigation Measures M-BIO-2a and M-BIO-2b would reduce the proposed project's impact to Snakes to a less-than-significant level (see page 81 of the PMND, or page 88 of the amended PMND).

CONCERN 15: The appellant asserts that the City must consider alternatives to the project and there are other alternatives that would provide greater conservation and public benefits.

“The project description does not indicate the City will consider alternatives. In a case like this where public concern and controversy is high, evidence of alternatives is widespread, and when massive take has occurred under existing protocols, the City cannot ensure that there will be no significant adverse environmental impacts without at least considering alternatives to the project proposal.” (Page 20 of the Appeal Letter)

“In particular, (ESA-PWA 2011) contributor Dawn Reiss has contributed a restoration model for Sharp Park that is based on the best scientific data available at Sharp Park and addresses all of the above deficiencies in the project. For example, where the projects suggests that both species are ‘conservation reliant’ due to their isolation, Ms. Reiss’ proposal emphasizes connective habitat corridors across Sharp Park.” (Page 20 of the Appeal Letter)

“Where the project suggests it will continue to drain and fertilize Sharp Park’s wetlands on the one hand, and then dredge excessive tule and cattail growth on the other, Ms. Reiss’ mitigation model constrains pumping so that water levels will rise high enough to drown excessive vegetation growth, and ensures that water levels rise and fall slowly so that Sharp Park’s entire wetland feature remains hydrologically connected and contains sufficient water for egg masses to develop into adult frogs.” (Pages 20 and 21 of the Appeal Letter)

“Where the project ignores the fundamental changes climate change will bring to this landscape, Ms. Reiss’ plan provides mitigation and recovery areas upland and inland from areas that will be immediately impacted by catastrophic flooding events, and then creates natural defenses around these areas by restoring wetlands and vegetative features between the rising sea and the restored habitats. These features will absorb and slow the rate of water if intrusion ever does occur.” (Page 21 of the Appeal Letter)

“Where the project blames the frog for an apparently indiscriminant breeding behavior and for laying eggs in ‘unsustainable’ habitats, Ms. Reiss’ mitigation and restoration plan recognizes that the California red-legged frog can successfully breed under natural conditions at Sharp Park, so long as the velocity, rapidity, and scope of the wetland draining project implemented by San Francisco is curtailed.” (Page 21 of the Appeal Letter)

“All of these outcomes would provide greater conservation and public benefits than the project disclosed in the notification, yet the City does not seem prepared to consider alternatives to the project proposal. Such reluctance is inconsistent with sound environmental review and the strictures of CEQA.” (Page 21 of the Appeal Letter)

RESPONSE TO CONCERN 15: A lead agency is not required by CEQA to consider project alternatives when there are no significant impacts identified resulting from the project.

A lead agency is not required by CEQA to consider project alternatives when there are no significant impacts identified resulting from the project, regardless of the level of public controversy. As discussed in the PMND prepared for the proposed project, with implementation of the identified mitigation measures, the project would not result in any significant impacts. Based on this, consideration of alternatives to the proposed project is not required under CEQA.

CONCERN 16: The appellant asserts that the project will destroy cover habitat for special-status species.

“The California red-legged frog and the San Francisco garter snake require multiple habitat conditions to survive. For example, ‘essential habitat for a breeding [San Francisco gartersnake] population includes open grassy uplands and shallow marshlands with adequate emergent vegetation, and the presence of both Pacific tree frog (*Pseudacris regilla*) and California red-legged frog breeding populations.’ ‘Emergent and bankside vegetation such as cattails (*Typha spp.*), bulrushes (*Scirpus spp.*), and spike rushes (*Juncus spp.* and *Eleocharis spp.*) apparently are preferred and used for cover.” (Page 21 of the Appeal Letter)

“Similarly, the ‘California red-legged frog requires a variety of habitat elements with aquatic breeding areas embedded within a matrix of riparian and upland dispersal habitats.’ The frog ‘spend[s] considerable time resting and feeding in riparian vegetation when it is present’ and can be ‘found up to 30 meters (100 feet) from water in adjacent dense riparian vegetation for up to 77 days.’ ‘Overall, [California red-legged frog] populations are most likely to persist where multiple breeding areas are embedded within a matrix of habitats used for dispersal.’ Recent studies demonstrate that in both breeding and non-breeding periods, California red-legged frogs predate almost exclusively on terrestrial species, Vredenburg Decl., p. 7 (Exhibit E), indicating uplands are also essential habitat for California red-legged frog prey.” (Pages 21 and 22 of the Appeal Letter)

“Sharp Park currently provides the habitat mixture both species require. However, the project proposal would transform one essential habitat type--emergent vegetation--into open water habitat ‘to improve water flow to the pumps’ so Sharp Park’s wetlands can be rapidly drained during the California red-legged frog’s breeding season. The City suggests this transformation is justified because ‘areas along the connecting channel and [Horse Stable Pond] that contain dense cattail growth are considered to be very low quality breeding habitat for the [California red-legged frog]’ and presumes the transformation will therefore cause frog populations to increase, ultimately providing more prey for the San Francisco gartersnake.” (Page 22 of the Appeal Letter)

“The City’s position is not supported by available evidence. If, as the City hypothesizes, emergent vegetation limits growth of California red-legged frog and San Francisco gartersnake populations at Sharp Park, the City’s records should show a decline in egg masses as the extent of emergent vegetation has increased. But the evidence indicates California red-legged frog egg mass counts have been generally increasing at Sharp Park/Mori Point since 2004; indeed, during the 2010-11 breeding season the City ‘recorded more than 3 times the eggmasses [SIC] than any other year.’

Similar numbers were observed during the 2011-12 breeding season. Exhibit D, p. 4.” (Page 22 of the Appeal Letter)

“Nor does available evidence indicate that Sharp Park’s San Francisco gartersnake population is limited by prey availability. If Sharp Park’s California red-legged frog population were too small to support its predator, City records should show a decline in adult frogs at Sharp Park. But while testifying against endangered species conservation measures at Sharp Park on behalf of golf advocacy groups, Dr. Mark Jennings stated ‘it has been common for the past couple of years at Sharp Park to find dozens and dozens of juvenile and adult [California red-legged frogs],’ and concluded that ‘there are relatively few sites within the current geographic range of the species that have such large populations of adult [California red-legged frogs]’. Furthermore, ‘trapping studies at Mori Point and Sharp Park since 2004 suggest that the [San Francisco gartersnake population again may be increasing, at least at Mori Point.’ ‘[C]apture rates for 2006 and 2008 reflected an increase over the 2004 rate of 104% and 5%, respectively... we observed an overall increase in the number of [San Francisco gartersnakes] trapped per unit effort within the project area.’” (Pages 22 and 23 of the Appeal Letter)

“While neither the availability of open water habitat nor frog population sizes limits productivity at Sharp Park, the best available science does indicate that egg mass and juvenile *survivorship* limits the California red-legged frog’s population growth ‘pumping expose[s] California red-legged frog eggs to desiccation,’ and that destruction of upland habitats limit the San Francisco gartersnake’s population growth.” (Page 23 of the Appeal Letter)

“Nearly all of the areas surrounding Laguna Salada and Horse Stable Pond are mowed regularly by the Golf Course, very near or immediately adjacent to the wetland edge. This leaves a very narrow band of emergent wetland habitat between the open water areas of the lagoon and the Golf Course links, and no protected upland in which SFGS can bask, breed, or seek refuge in a burrow. Beyond the narrow band of emergent vegetation, SFGS would face a very high likelihood of being taken directly by mowing operations. Dexter Decl., p. 10 (Exhibit K).” (Page 23 of the Appeal Letter)

“These effects are significant by any measure, and cause adverse environmental impacts that require thorough environmental review and mitigation.” (Page 23 of the Appeal Letter)

RESPONSE TO CONCERN 16: The proposed project would not result in a significant loss of habitat for special-status species.

The Biological Opinion issued by the USFWS found that the proposed project would not jeopardize the continued existence of Frogs or Snakes (see page 38 of the Biological Opinion). The PMND addressed both temporary and cumulative impacts to special-status species including Frogs and Snakes resulting from the proposed project under Impact BIO-2 and found that the proposed project would not result in any significant impacts to special-special species, including Frogs and Snakes.

As discussed on page 73 of the PMND (page 79 of the amended PMND), injury, exposure disorientation and disruption of normal behaviors would likely result from the removal and/or disturbance of vegetation, sediments, and cover sites including animal burrows, boulders or rocks, organic debris such as downed trees or logs in HSP and the connecting channel. To maintain breeding habitat for CRLF, cover habitat in the freshwater marsh would be reduced as part of this project. However, the amount of cover habitat impacted by the proposed project is not substantial compared to the total wetland and upland cover habitat present in the LS wetland complex. Ample undisturbed cover habitat for CRLF would remain within the freshwater wetlands and the uplands adjacent to the wetlands. This level of conversion of the cover habitat for Frogs and Snakes would not result in a significant impact to Frogs or Snakes. The appellant appears to assert that even this insubstantial level of conversion of freshwater marsh present in the LS wetland complex to open water would result in a significant impact to frogs or snakes, without presenting any evidence supporting the assertion. Thus, the appellant fails to make a fair argument based on substantial evidence that the project would result in a significant impact.

CONCERN 17: The appellant asserts that special-status species could become entrained by the proposed screens proposed to be installed at the pump intake.

“The following comments are specific to particular elements of the project proposal. Each indicates that there is, at least, a fair argument that the project will cause significant adverse environmental impacts at Sharp Park: The proposed pumping protocols do not describe the biological screens to prevent listed species from being entrained. Biological monitors at Sharp Park have observed crayfish entrained by Sharp Park’s pumping operations, and stated that “[i]f crayfish can become entrained in pump than frogs might also” [Swaim 2008b, p. 1]. (Hayes 2012) makes recommendations on screening at Sharp Park.” (Pages 23 and 24 of the Appeal Letter)

RESPONSE TO CONCERN 17: No changes are proposed to the ongoing pumping protocols as part of the proposed project. The existing or proposed screen at the pump intake would not result in a significant impact to special-status species.

The appellant assumes that the proposed project involves new or modified pumping protocols by the “proposed pumping protocols.” This assumption is incorrect. No changes are proposed to the ongoing pumping protocols as part of the proposed project.

It is not clear whether the appellant’s concerns are related to the existing screen at the pump intake or to the proposed secondary metal debris screen. If the appellant’s concerns are related to the existing screen at the pump intake, the existing screen’s potential impacts to special-status species are not required to be analyzed as part of the environmental review for this project because the existing screen is considered to be a baseline condition for the purpose of the environmental review of the proposed project. No changes are proposed to the existing screen, therefore, no impact analysis is required concerning the existing screen because a lead agency is not required to analyze the baseline conditions of a project.

If the appellant's concerns are related to the proposed metal debris screen, the appellant has failed to present substantial evidence that the proposed installation of the metal debris screen would result in a significant impact to special-status species. As discussed on page 7 of the PMND (page 7 of the amended PMND), a secondary metal debris screen would be installed at the pump intake structure in consultation with the USFWS. This screen would be metal mesh with holes measuring approximately one inch by one half inch (see the Construction Action section on page 6 of the Biological Opinion).

The Biological Opinion discusses the possibility of Frog mortality through entrainment (individuals being pulled along with water and trapped against screening or pulled into the pumps) of egg masses and individual larvae at the pumps (see pages 33 and 34 in the Biological Opinion). The Biological Opinion further discusses the restoration actions and conservation measures that SFRPD is committing to in order to reduce these effects and protect the species. The Biological Opinion concludes that this project, including the conservation measures, the uplands restoration work, and the continued operations and maintenance of the golf course, is not likely to jeopardize the continued existence of Frogs or Snakes. The conservation measures set forth in the Biological Opinion and incorporated into the project description and mitigation measures would reduce the adverse effects of the proposed construction and operations and maintenance activities on the survival and recovery of Frogs and Snakes.

The PMND has been revised to include an additional description of the proposed metal debris screen (see page 7 of the amended PMND) and an impact analysis concerning the proposed metal debris screen (see page 88 of the amended PMND). These revisions to the PMND do not otherwise change the analysis or conclusions of the PMND and would not themselves cause a significant effect on the environment. As such, the proposed project's impact to biological resources would remain less than significant with mitigation.

CONCERN 18: The commenter asserts that oligohaline (fresh-brackish) lagoon salinity is incorrectly reported as "freshwater."

"Oligohaline (fresh-brackish) lagoon salinity is incorrectly reported as 'freshwater', inconsistent with Tetra Tech 2009 and Kamman 2009. The project description in the MND on page 3, and subsequently, describes the lagoon as a 'freshwater' pond and wetlands. This is incorrect, and is inconsistent with the hydrological assessment of Laguna Salada prepared for SFRPD by Tetra Tech (2009), based on the hydrologic report on Laguna Salada by Kamman (2009; Appendix A in Tetra Tech 2009). The SFRPD's own hydrological studies report salinity range between 0.7 and 2.5 parts per thousand (ppt). This salinity range is also correctly stated on p. 94 of the MND. This salinity range is oligohaline, not 'freshwater', and is physiologically and ecological significant. It indicates a persistent dilution of salts from seawater either seeping through the Salada Beach, residual salinity in the bed sediments. Seawater sources of salinity include sulfates, a source of sulfur affecting bed sediments and coastal wetland soils. The MND is inconsistent in its statement

of lagoon salinity, and incorrect in characterizing it as ‘freshwater’.” (Page 3 of Peter Baye’s Comment Letter)

“Kamman (2009) described ‘freshwater’ as salinity < 1.0 ppt. He reported that the earthen ‘seawall’ eliminates characteristic (natural) episodic tidal exchange between the ocean and lagoon, but it did not state that all hydrologic connectivity is lacking between the lagoon and ocean. On the contrary, Kamman reported evidence of probable groundwater connectivity between lagoon and ocean through beach seepage, and recorded relatively saline groundwater with a salinity of 15 ppt (nearly half seawater salinity concentration) was observed in the sandy flat between Laguna Salada and the earthen seawall. This is also not consistent with the MND’s claim of ‘freshwater’ pond and wetlands. Note that cattail and tule marsh vegetation dominance occurs in both freshwater and oligohaline wetlands, and is not diagnostic of freshwater salinity range.” (Page 3 of Peter Baye’s Comment Letter)

“The incorrect statement of lagoon salinity is important because the MND invalidly relies on the assumption that exclusion seawater salts from the lagoon precludes the occurrence of sulfur from seawater to fuel significant sulfide reduction in organic, anoxic sediments. Obviously, the consistent low salinity in the lagoon indicates seawater salts are always present – including sulfate, the next most abundant anion in seawater after chloride.” (Page 4 of Peter Baye’s Comment Letter)

RESPONSE TO CONCERN 18: The PMND has been revised to characterize the LS wetland system as a fresh-to-brackish wetland system. This revision does not otherwise change the analysis or conclusions of the PMND.

The PMND has been revised to characterize the LS wetland system as a fresh-to-brackish wetland system. These revisions to the PMND do not otherwise change the analysis or conclusions of the PMND, including the discussion and Mitigation Measure M-BIO-2b in the PMND concerning acid sulfate soils. The fact that low levels of salinity are present does not necessarily mean that such salinity originates from the ocean or is a residual in the soils. It is possible that such salinity may originate from upstream sources or any of these sources. Regardless, water quality conditions in the Laguna Salada wetland complex support a vegetation community that is indicative of a freshwater marsh, which in turn allows Frogs and Snakes to flourish. This supports the conclusion that conditions in the wetland complex are not adversely affected by the low-level salinity.³⁰

CONCERN 19: The commenter asserts that the proposed Mitigation Measure M-CP-2 concerning archeological resources is not a credible or feasible mitigation measure.

³⁰ David Munro, Tetra Tech. *Email to Stacy Bradley, SFRPD, Revised Text*, November 26, 2013. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

“The MND on page 30 states that the project could have significant impacts on buried archaeological resources, given the location of known midden sites, and the depth of proposed excavation. The proposed mitigation to reduce this significant impact to less than significant levels relies entirely on excavation equipment operators with no expertise in detection of archeological artifacts (such as shells, bones, heat-altered rocks, bone or stone tools, or flaked stone) to detect ‘accidental discovery’ in excavated jet-black iron sulfide-stained organic much during excavation, and in time to cease excavation and disturbance upon detection. This is not a credible or feasible mitigation measure. I have ample experience over two decades observing excavation and dredging of coastal wetland and aquatic sediments, including strongly organic and sulfidic muds like those that occur in Horse Stable Pond. Organic and iron-sulfide staining of bulk sediment removal would render any small midden artifacts utterly undetectable in the absence of sorting (sieving) and washing. The mitigation measure proposed is infeasible. Advance assessment of archeological resources (a sampling plan prepared by a qualified archeologist) at proposed dredging sites would be required to detect buried archeological resources in organic, iron sulfide-stained fine sediments.” (Page 6 of Peter Baye’s Comment Letter)

RESPONSE TO CONCERN 19: Because proposed excavation activities are expected to be quite shallow, the project has a low-to-moderate likelihood of affecting archeological resources. Nevertheless, as a conservative measure, Mitigation Measure M-CP-2 has been revised to require archeological testing at the project site prior to commencement of any on-site work related to the proposed project.

As discussed on pages 29 and 30 of the PMND (page 30 of the amended PMND), both the immediate coastal and inland areas around the project site are well-documented for prehistoric and historical period Native American sites. Because project activities are expected to be quite shallow, especially within current wetland habitats (three feet below ground surface), the potential for the project to affect prehistoric deposits is considered low--or at its greatest, moderate--in likelihood. Given this, the Planning Department believed that the original Mitigation Measure M-CP-2, addressing accidental discovery, would be adequate to avoid significant impacts to archeological resources that may be present within the project site. The appellant asserts that if prehistoric deposits were encountered during project excavation they would not be detectable as such by an untrained professional as a result of organic and iron-sulfide staining raises the possibility that Mitigation Measure M-CP-2 requires some revision. This claim also implies that monitoring of such excavations by a qualified archeological consultant would be inadequate for the same reason and that only the implementation of an archeological sampling plan for the project by a qualified archeological consultant can adequately address the potential for such deposits being adversely affected by the project. Archeological testing for the presence of prehistoric deposits within not previously disturbed soils is a more conservative approach to ensure that if prehistoric deposits are present within soils potentially disturbed by the project, such deposits are identified and appropriately treated prior to such disturbance occurring and would further ensure that impacts are avoided. Accordingly, Mitigation Measure M-CP-2 has been revised to require archeological testing at the project site. These revisions to the mitigation measure do not otherwise change the analysis or conclusions of the PMND and are equally or

more effective than the mitigation measure prior to revision and would not themselves cause a significant effect on the environment. As such, the proposed project's impact to archeological resources would remain less than significant with mitigation.

CONCLUSION

Staff recommends that the Planning Commission adopt the motion to uphold the Preliminary Mitigated Negative Declaration. No substantial evidence supporting a fair argument that a significant environmental effect may occur as a result of the project has been presented that would warrant preparation of an Environmental Impact Report.



Peter R. Baye, Ph.D.
Coastal Ecologist, Botanist
33660 Annapolis Road
Annapolis, California 95412

baye@earthlink.net
(415) 310-5109



San Francisco Planning Department
1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479
attention: Kei Zushi - (415) 575-9036 kei.zushi@sfgov.org

via email

October 18, 2013

SUBJECT: Notification of Availability and Intent to Adopt Mitigated Negative Declaration, September 18, 2013, Case No 2012.1427E, Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project; concerns regarding potential environmental effects

To the San Francisco Planning Department:

I would like to submit the following comments on the proposed Mitigated Negative Declaration for the Sharp Park Enhancement Project. These comments follow my scoping comments submitted on January 29, 2013, which are incorporated by reference.

1. Project purpose of improved lagoon and wetland drainage lacks assessment of significant impacts.

The project site description on page 3 of the MND explicitly states that the purpose of constructing the 1000 ft long connector channel between Horse Stable Pond (HSP) and Laguna Salada is to drain the lagoon and wetlands within the hydrologically linked wetland complex:

The Sharp Park Golf Course is located within an 845-acre watershed.1 HSP is located south of LS and consists of an open water pond and a freshwater wetland. It is connected to LS via an approximately **1,000-foot-long channel that was constructed to drain water from the lagoon to HSP, and together these three features form a wetland complex.**

MND p. 3 (emphasis added)

Page 4 of the MND explains that the growth of tules and cattails in the connector channels impairs the drainage of the lagoon by pumps at HSP, consistent with conclusions of Kamman

(2009). The description of the proposed project activities on page 5 of the MND states that the channel would be cleared of vegetation and sediment to remedy obstruction of flows between HSP and the main pond or lagoon, improving ability to drain water from the lagoon by pumping: “3) removal of sediment and emergent vegetation within HSP and the connecting channel that links HSP with LS”. The MND, however, completely fails to assess the hydrological and ecological impacts of increasing drainage of the lagoon by increasing hydraulic connectivity between the main lagoon pond and HSP, even though it is clearly the basic purpose of the action. Any significant change in the duration and depth of flooding or soil saturation in lagoon wetlands has important ecological effects. Increased drainage of wetlands, above baseline (pre-project) conditions is a potentially significant impact I cited in my scoping comments on this project (Baye 2013). My scoping comments appear to be entirely ignored about this most basic modification of lagoon wetland hydrology, and their impacts on further spread of cattails and tules. To reiterate my scoping comments from 29 January 2013 regarding wetland hydrology impacts on wetland vegetation and habitat structure:

Lagoon drainage (pumping) effects

- What are the impacts of lowered lagoon water levels (lagoon drawdown) on the spread of cattails and tules over the lagoon bed? (potential indirect significant impact)
- What are the baseline (pre-project) effects of lagoon drainage (pumping, lowering lagoon levels) on water depths and the spread of cattails and tules on the lagoon bed? (baseline for assessment of potential indirect significant impact)
- What does SFRPD assume to be the critical limiting water depth range, and duration of limiting flood depth, for tules and cattails? (threshold for potential indirect significant impact)
- How long, and in what time of year, would areas of the lagoon be lowered to submergence depths that are shallower than the presumed critical depth for restricting spread of cattails beyond their pre-project extent? (threshold and mechanism for potential indirect significant impact)
- What is the *minimum area* of the lagoon bed that would be maintained at depths beyond the limits of submergence tolerance of cattails and tules? (threshold for potential indirect significant impact)
- What is the *maximum duration* of drawdown (lagoon lowering) to depths shallower than the limit of submergence tolerance of cattails and tules? (threshold for potential indirect significant impact)
- How will maintenance of low lagoon levels prior to storms (lagoon drawdown for stormwater detention capacity) affect the *vulnerability of the lagoon to seawater flooding during oceanic storm overwash events*? How much will drawing down the lagoon prior to storms impair the lagoon’s capacity trap heavier seawater overwash flooding at the lagoon bottom by stratification of heavier saltwater under lighter freshwater? How much would lagoon drawdown

during winter storm season expose the marsh shoreline to potential direct ocean water flooding, or flooding by less diluted seawater, compared with full freshwater-flooded lagoon conditions? (threshold and mechanism for potential indirect long-term significant impact)

- How will maintenance of proposed target lagoon levels affect the *elevation range* of freshwater and fresh-brackish marsh habitat of listed threatened and endangered wildlife species in relation to the elevation range of rising sea level or potential storm oceanic overwash flooding?

The MND completely fails to address potentially significant direct and indirect hydrological impacts of the proposed project's drainage component on Laguna Salada wetlands, despite my detailed scoping comments on this subject. There is no proposed mitigation for increasing the drainage of the lagoon, and making its bed shallower more often than pre-project conditions. Increasing the drainage of the lagoon will increase the spread of cattails and tules over the remaining open water. Cattails and tules are primarily limited by water depth and duration, which is directly affected by drainage and pumping. SFRPD continues to provide no direct evidence of significant recent sedimentation within the main lagoon pond commensurate with the timing, rate or magnitude of cattail and tule spread. The proposed project will likely accelerate the spread of tules and cattails. This will foreseeably result in even more misguided proposals to dredge the lagoon to remedy fictional "sedimentation" problems and "vegetation overgrowth" that is in fact directly related to the drainage of the lagoon.

2. Salinity and seawater sources of sulfur

Oligohaline (fresh-brackish) lagoon salinity is incorrectly reported as "freshwater", inconsistent with Tetra Tech 2009 and Kamman 2009. The project description in the MND on page 3, and subsequently, describes the lagoon as a "freshwater" pond and wetlands. This is incorrect, and is inconsistent with the hydrological assessment of Laguna Salada prepared for SFRPD by Tetra Tech (2009), based on the hydrologic report on Laguna Salada by Kamman (2009; Appendix A in Tetra Tech 2009). The SFRPD's own hydrological studies report salinity range between 0.7 and 2.5 parts per thousand (ppt). This salinity range is also correctly stated on p. 94 of the MND. This salinity range is oligohaline, not "freshwater", and is physiologically and ecologically significant. It indicates a persistent dilution of salts from seawater either seeping through the Salada Beach, residual salinity in the bed sediments. Seawater sources of salinity include sulfates, a source of sulfur affecting bed sediments and coastal wetland soils. The MND is inconsistent in its statement of lagoon salinity, and incorrect in characterizing it as "freshwater".

Kamman (2009) described "freshwater" as salinity < 1.0 ppt. He reported that the earthen "seawall" eliminates characteristic (natural) episodic tidal exchange between the ocean and lagoon, but it did not state that all hydrologic connectivity is lacking between the lagoon and ocean. On the contrary, Kamman reported evidence of probable groundwater connectivity between lagoon and ocean through beach seepage, and recorded relatively saline groundwater with a salinity of 15 ppt (nearly half seawater salinity concentration) was observed in the sandy flat between Laguna Salada and the earthen seawall. This is also not consistent with the MND's claim of "freshwater" pond and wetlands. Note that cattail and tule marsh vegetation dominance occurs in both freshwater and oligohaline wetlands, and is not diagnostic of freshwater salinity range.

The incorrect statement of lagoon salinity is important because the MND invalidly relies on the assumption that exclusion seawater salts from the lagoon precludes the occurrence of sulfur from seawater to fuel significant sulfide reduction in organic, anoxic sediments. Obviously, the consistent low salinity in the lagoon indicates seawater salts are always present – including sulfate, the next most abundant anion in seawater after chloride.

3. Sulfide and acid sulfate biogeochemical impacts and mitigation.

The explanation of sulfur oxidation-reduction sediment biogeochemistry on page 96 of the MND (water quality) is essentially accurate, but it is inconsistent with the utterly confused explanation on pp. 76-77 of the MND, which garbles hypoxia, pH, and inconsistent oxidation-reduction states associated with aerobic and anaerobic sediments. Acid sulfates are the oxidized forms of sulfur compounds, not the reduced forms (sulfides) associated with hypoxia and anoxia. The temporary suspension of anoxic iron sulfide-rich sediment, and free hydrogen sulfide (rotten egg scent) in the water column is the cause of acute hypoxia. Oxidative formation of acid sulfates and iron oxides is a slow process occurring over many days or weeks in aerobic conditions. The MND argues on p. 77 that since no acid sulfate conditions were detected in the last episode of dredging 10 years ago, the impact is unlikely. This is utterly fallacious, since no measurements of soil sulfate levels or pH were sampled. An even more ludicrous fallacy on p. 77 is the exclusion of tidal flows precludes the existence of sulfur sources in sediments. Obviously, if salinity range is up to 2.5 ppt, and the only original salinity source is seawater, sulfates (the second most abundant anion in seawater) is present in the oligohaline sediments. Moreover, I provided direct observation of both iron sulfide and hydrogen sulfide in near-surface anoxic sediments of the exposed bed of Laguna Salada in the ESA-PWA report (ESA-PWA 2010). Strongly sulfidic sediments are ubiquitous and conspicuous throughout the lagoon complex, and readily detectible by any qualified wetland ecologist who looks for them. It is disingenuous of the MND, as well as flatly incorrect, to assert that they are “unlikely”

Proposed mitigation M-Bio-2b fails as a CEQA mitigation measure because it provides no objective chemical standard or biological criteria or threshold for sulfide concentrations, pH, Biological Oxygen Demand (a measure of hypoxia in the suspended sediment plum around dredging sites), or redox thresholds for significant biological impacts. It instead relies on purely subjective voluntary submittal of data (not evidence of actual consultation and reply!) with resource agencies, with no evidence that resource agencies have staff resources or commitments to comply with the mitigation measure. The mitigation measure is vague, programmatic, and unenforceable. Dredge sediments are routinely sampled for aquatic impacts throughout the San Francisco Bay area. It is seldom that dredging occurs in nontidal wetlands with endangered species (for good reason), but the analytic methods for assessing aquatic impacts of hypoxic sediment plumes during dredging are established. They are not cited by the MND. Nor does the MND show any evidence of consultation with the RWQCB – SFB for appropriate dredge sediment and water quality protocols adapted to the distinctive setting of Laguna Salada, including specific criteria for water column hypoxia and sulfide toxicity during dredging. Hypoxia and sulfide toxicity are not the same chemical phenomenon, even though they are physically related by suspension of reduced iron sulfide-rich sediment.

The MND is deficient in basic understanding of acid sulfate soils, sulfur oxidation-reduction sediment processes, and ecotoxicity. Below is a limited sample of relevant scientific literature to support improved understanding.

Bagarinao, T. 1992. Sulfide as an environmental factor and toxicant—Tolerance and adaptations in aquatic organisms. *Aquat.Toxicol.* 24:21–62. doi: 10.1016/0166-445X(92)90015-F

Beauchamp, R.O., Bus, J.S., Popp, J.A., Boreiko, C.J., Andjelkovich, D.A., and Leber, P. 1984. A critical review of the literature on hydrogen sulfide toxicity. *Crit. Rev. Toxicol.* 13, 25–97. doi: 10.3109/10408448409029321

Connell, W.E., and Patrick, W.H. Jr. 1968. Sulfate reduction in soil: effects of redox potential and pH. *Science* 159, 86–87. doi:10.1126/science.159.3810.86

Dent, D. 1986. Acid Sulphate Soils: a Baseline for Research and Development. Wageningen: ILRI Publ. <http://www2.alterra.wur.nl/Internet/webdocs/ilri-publicaties/publicaties/Pub39/pub39-h1.0.pdf>

Dent, D. and Dawson, B. undated. The Acid Test: an expert system for acid sulfate soils. <http://www.isric.org/sites/default/files/AcidSKit/identman.pdf>

Lamers, L.P.M., Tomassen, H.B.M., and Roelofs, J.G.M. 1998. Sulfate- induced eutrophication and phytotoxicity in freshwater wetlands. *Environ. Sci. Technol.* 32, 199–205.

Lamers, Leon P.M., Josepha M.H. van Diggelen, Huub J.M. Opden Camp, Eric J.W. Visser, Esther C.H.E.T. Lucassen, Melanie A. Vile, Mike S.M. Jetten, Alfons J.P. Smolders and Jan G.M. Roelofs. 2012 Microbial transformations of nitrogen, sulfur, and iron dictate vegetation composition in wetlands: a review. *Frontiers in Microbiology* 26:1-12. doi: 10.3389/fmicb.2012.00156



Iron oxide surface films and iron sulfide accumulation of muds exposed by artificial lagoon drawdown at Laguna Salada, 2010. Iron oxide (orange-brown mineral films indicative of oxidation of iron sulfide and acid sulfates in brackish coastal sediments subject to alternating strong hypoxia and oxidation) are apparent in drawdown-emergent muds at the northeast end of Laguna Salada (left). Organic-rich sediment immediately below the iron oxide-stained surface sediment film is deep black (right), indicative of toxic iron sulfide, formed under strong anoxic bottom conditions, exposed at the marsh surface by artificial drawdown of the lagoon.

4. Archaeological resources and significant impacts.

The MND on page 30 states that the project could have significant impacts on buried archaeological resources, given the location of known midden sites, and the depth of proposed excavation. The proposed mitigation to reduce this significant impact to less than significant levels relies entirely on excavation equipment operators with no expertise in detection of archeological artifacts (such as shells, bones, heat-altered rocks, bone or stone tools, or flaked stone) to detect “accidental discovery” in excavated jet-black iron sulfide-stained organic much during excavation, and in time to cease excavation and disturbance upon detection. This is not a credible or feasible mitigation measure. I have ample experience over two decades observing excavation and dredging of coastal wetland and aquatic sediments, including strongly organic and sulfidic muds like those that occur in Horse Stable Pond. Organic and iron-sulfide staining of bulk sediment removal would render any small midden artifacts utterly undetectable in the absence of sorting (sieving) and washing. The mitigation measure proposed is infeasible. Advance assessment of archeological resources (a sampling plan prepared by a qualified archeologist) at proposed dredging sites would be required to detect buried archeological resources in organic, iron sulfide-stained fine sediments.

Sincerely,



Peter Baye
baye@earthlink.net

Literature Cited

Baye, P. 2013. Scoping comment letter in response to Notification of Project Environmental Review dated January 15, 2013, Case No 2012.1427E, Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project; concerns regarding potential environmental effects . submitted January 29, 2013.

ESA-PWA, Peter Baye, and Dawn Reis. 2010. Preliminary Ecosystem Restoration Feasibility Assessment, Laguna Salada, Pacifica, CA. Report prepared for Wild Equity.

Kamman, G. 2009. Sharp Park Conceptual Restoration Alternatives Report. APPENDIX A: HYDROLOGICAL REPORT. In: Tetra Tech (2009).

Tetra Tech, K. Swaim, and Nickels Golf Group. 2009. Sharp Park Conceptual Alternatives Report. Prepared for San Francisco Recreation and Parks Department.



*Building a healthy and sustainable global community for people
and the plants and animals that accompany us on Earth*

RECEIVED

October 18, 2013

Planning Department
ATTN: Sarah B. Jones
San Francisco Planning Commission
1650 Mission Street, Suite 400
San Francisco, CA 94103

OCT 18 2013

CITY & COUNTY OF S.F.
PLANNING DEPARTMENT
P I C

RE: Case No. 2012.1427E. APPEAL OF THE MITIGATED NEGATIVE DECLARATION FOR THE SAN FRANCISCO RECREATION AND PARK DEPARTMENT'S PROPOSED "SHARP PARK PUMPHOUSE SAFETY AND INFRASTRUCTURE IMPROVEMENT PROJECT"

Dear Ms. Jones:

The letter constitutes the Wild Equity Institute's appeal of the Preliminary Mitigated Negative Declaration ("PMND") the Planning Department intends to adopt for the Sharp Park Pumphouse Safety and Infrastructure Improvement Project ("Pumphouse Project"), Case No. 2012.14727E. We also attach and incorporate by reference our comments on the Pumphouse Project which we submitted to the Planning Department on January 29, 2013, and which I observed in the Planning Department's case file for this project on October 10, 2013.

Preeminent herpetologists, coastal ecologists, and hydrologists have reviewed the revisions and mitigation measures announced in the PMND. Below you will find the facts, reasonable assumptions predicated upon those facts, and expert opinions that explain how, even as revised and mitigated, the Pumphouse Project will cause significant adverse effects on the threatened California red-legged frog (*Rana draytonii*), the endangered San Francisco gartersnake (*Thamnophis sirtalis tetrataenia*), and Sharp Park's hydrology and water quality.

This evidence makes clear that there is, at the very least, a fair argument that the Pumphouse Project may have a significant effect on the environment—which in turn requires the Department to prepare an Environmental Impact Report ("EIR") before approving the project. Cal. Pub. Res. Code § 21151; *Sierra Club v. County of Sonoma*, 6 Cal. App. 4th 1307, 1316 (1992) ("Section 21151 creates a low threshold requirement for initial preparation of an EIR and reflects a preference for resolving doubts in favor of environmental review when the question is whether any such review is warranted. [citations] For example, if there is a disagreement among experts over the significance of an effect, the agency is to treat the effect as significant and prepare an EIR."). An EIR is particularly important here, because there are feasible alternatives to the proposed project that would reduce or avoid the Pumphouse Project's significant environmental effects: and only an EIR can provide the Department with the analytical framework necessary to consider alternatives to the proposed project.

I. BY EXCLUDING PUMPHOUSE OPERATIONS FROM THE PROJECT DESCRIPTION THE DEPARTMENT HAS FAILED TO CONSIDER AND MITIGATE SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PUMPHOUSE PROJECT.

An accurate project description is an indispensable element of informed and legally sufficient environmental review processes under CEQA. *Cnty. of Inyo v. City of Los Angeles*, 71 Cal. App. 3d 185, 193, (Ct. App. 1977) (Calling an accurate project description the “*sine qua non*” of CEQA review). The PMND’s project description, however, has failed to include the Pumphouse Project’s key objective: to operate the pumphouse more extensively than it has ever been operated before. This increase in pumphouse operations is likely to have significant, adverse consequences on Sharp Park’s threatened and endangered species, its water quality, and its hydrology. Because these significant effects exist, the Department must conduct an EIR to make an informed decision about the Pumphouse Project.

A. THE PUMPHOUSE PROJECT’S PRIMARY PURPOSE IS TO INCREASE PUMPHOUSE OPERATIONS, YET THE EFFECTS OF PUMPHOUSE OPERATIONS HAVE BEEN EXCLUDED FROM ENVIRONMENTAL REVIEW.

The Pumphouse Project’s record reveals that expanding pumping operations is the very purpose of the project. For example, the project description explains “*operation of the flood control pump system is necessary to manage floodwaters both on Sharp Park and adjacent properties.*” PMND, p. 4 (emphasis added). It then explains that “[t]wo factors *adversely affect the operation of the pumps.* First, *pump operation is impaired* by sediment buildup and vegetation growth around the pump intake structure and along the connecting channel between [Horse Stable Pond and Laguna Salada]. Second, *pump operation is impaired* by the buildup of vegetation on the pump intake screens.” *Id.* (emphasis added). The PMND then describes what the Pumphouse Project will do to expand pump operations: “[s]ediment and emergent vegetation, including cattails (*Typha angustifolia*) and bulrush (*Scirpus americanus*), near the existing pumphouse *would be removed in order to reduce obstructions to water flow into the pump intake structure. . . .*” PMND, p. 6 (emphasis added); *see also id.* (A primary purpose of the Pumphouse Project is to “remove impediments to water flow within the wetland complex.”).

A logical consequence of accelerating water flow to the pumphouse is that pumphouse operations will expand. But the PMND does not consider the effects of expanded pumphouse operations, because the Department expressly excludes all pumphouse operations from the project description:

Although ongoing golf course operations, such as pump management and operation, mowing, and golf cart use, are discussed in the Biological Opinion, *these ongoing operations and maintenance activities are not considered part of the proposed project for purposes of this CEQA analysis, but rather are considered part of the existing, or baseline, conditions. No changes to golf course operations and maintenance, including operations of the pumps, are proposed as part of this project.*

PMND, p. 9 (emphasis added). Yet the project sponsor, San Francisco’s Recreation and Park Department (“SFRPD”), has consistently acknowledged that the Pumphouse Project will in fact

result in enhanced pumphouse operations. Specifically, SFRPD has acknowledged that (1) the wetland complex's aquatic vegetation moderates the flow of water from Laguna Salada to the pumphouse^{1, 2}, and (2) if the aquatic vegetation was removed the pumphouse would drain more of the wetland complex, and at faster rates. For example, in a recent deposition John Ascariz, the Recreation and Park Department's Station Engineer for the pumphouse, explained that the Laguna Salada wetland complex moderates pumphouse operations at Sharp Park, and that pumphouse operations would increase if aquatic vegetation were removed from the system:

Q. So I guess one thing I'm still trying to understand, if we can, is how the growth of the tules over time is impacting that number?

A. To not let the water come into the pump station.

Q. It's keeping the water out of the pump station?

A. Keeping it way up above. All those tules is keeping like a dam and keeping all that water all up in the golf course instead of letting it flow down. You were saying through that channel creek is all grown where it's stopping the water from draining to our pump station.

Q. It's your understanding that at some point the pump is no longer draining the golf course; is that right?

¹ Letter from Sean Sweeney, Recreation and Park Department Golf Program Director, to Chris Nagano, Chief—Endangered Species Division, U.S. Fish and Wildlife Service (Nov. 30, 2006) (Exhibit A) (“We have been pumping down Horse Stable Pond on a controlled basis for the past three weeks and are installing a “by pass” pump to bring down the level of Laguna Salada to hopefully prevent the flooding that occurred last winter. *The channel draining Laguna Salada into Horse Stable Pond is completely choked with tules and bulrush which have dramatically slowed the natural drainage from Laguna Salada. Our plan is to increase the water holding capacity of the Laguna Salada basin prior to any large winter storms.*”) (emphasis added).

² The project description in the Pumphouse Project's Biological Opinion—which “was provided by SFPRD in the *Sharp Park Safety, Infrastructure Improvement and Habitat Enhancement Project Biological Assessment*” and upon which the PMND heavily relies—also recognizes that the Laguna Salada wetland complex moderates pumphouse operations:

California red-legged frog breeding and deposition of egg masses coincide with winter storm events (Storer 1925, Service 2002) which cause water levels to rise in Horse Stable Pond, Laguna Salada, and surrounding wetlands (SFRPD 2012). Although water levels may be lowered in advance of winter storms to provide additional water storage capacity, the pumps are not able to *instantaneously lower water levels throughout the site as storm water runoff accumulates from the surrounding watershed* (Geomatrix 1987; Kamman Hydrology and Engineering, Inc. 2009; Hayes 2012).

U.S. Fish and Wildlife Service (USFWS). Formal Endangered Species Consultation on the Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project in San Mateo County, California. 08ESMF00-2012-F-0082-2. October 2, 2012. p. 33 (emphasis added).

A. Very slow.

...

Q. Do you recall seeing the golf course flooded last winter?

A. Yes.

Q. And why did it flood if you had the pump set at this low level?

A. Because all the tules.

MR. CLEMENTS: Objection. It's an incomplete hypothetical. It's vague. You can answer.

THE WITNESS: Because the tules are growing and stopping our water from coming to the pumps. Then it floods all out. It's holding the water all out at the golf course instead of letting it come to our pumps for we can pump it out.

...

Q. Again, as best you understand from your experience, if the tules were removed, then the pumps would be able to get the water out more efficiently; is that right?

A. Yes.

Q. And do you think that you would be able to keep the course from flooding if the tules weren't there?

A. Yes.

Q. Even in a winter like last winter where there was a lot of rain?

MR. CLEMENTS: Objection. Calls for speculation.

MR. CRYSTAL: Q. Based on your experience.

A. Yes. It would do good with the pumps running. It would pump that water out.

Ascariz Dep. pp. 62, 80-81 Dec. 14, 2011. (Exhibit B). Mr. Ascariz's testimony explains how baseline conditions in the Laguna Salada complex moderate the rate and extent of pumphouse operations, and also explains how the activities called for in the Pumphouse Project—dredging sediment and aquatic vegetation from Horse Stable Pond and the connecting channel—will

expand pumphouse operations. Thus, the PMND's assumption that the Pumphouse Project will have no effect on the rate and extent of baseline pumping operations is unsupported by the record: indeed, the assumption is flatly contradicted by the project sponsor itself.

B. INCREASING PUMPHOUSE OPERATIONS WILL HAVE SIGNIFICANT ENVIRONMENTAL EFFECTS ON ENDANGERED SPECIES, WATER QUALITY, AND HYDROLOGY.

When a change occurs in one part of the circuit, many other parts must adjust themselves to it. Change does not necessarily obstruct or divert the flow of energy; evolution is a long series of self-induced changes, the net result of which has been to elaborate the flow mechanism and to lengthen the circuit. Evolutionary changes, however, are usually slow and local. *Man's invention of tools has enabled him to make changes of unprecedented violence, rapidity and scope.*

Aldo Leopold, *A Sand County Almanac* 181 (Oxford University Press 2001) (1949).

The Project Sponsor predicts that the Pumphouse Project will increase the rate water flows to the pumphouse, and keep Laguna Salada hydrologically connected to the pumphouse throughout a greater portion of the year. This will expand pumphouse operations at Sharp Park, which will in turn cause significant environmental effects on a variety of resources that are already stressed by the existing rate and scope of pumphouse operations. Yet none of these effects have been assessed, let alone mitigated, by the Department. This is a violation of CEQA, and the Department must remedy this violation by preparing an EIR for the Pumphouse Project.

1. EXPANDING PUMPHOUSE OPERATIONS WILL HAVE SIGNIFICANT ADVERSE EFFECTS ON THE CALIFORNIA RED-LEGGED FROG.

For two decades, the City has known that its operation and management of Sharp Park Golf Course takes large numbers of California red-legged frogs. For example, in 1992 consultants reported to the City that "pumping of water out of Horse Stable Pond and the resultant exposure of shoreline was causing massive frog egg mass mortality." Exhibit C, p. 24. Nonetheless, the City has continued to drain Sharp Park's wetlands to ameliorate chronic Golf Course flooding. As expected, the City stranded and desiccated numerous California red-legged frog egg masses in subsequent years, with the City's consultants and staff documenting multiple mortality events in 2003, 2004, 2005, and 2008.³

Then on January 3, 2012, before the first large rain of the 2011-12 frog breeding season, the City ordered the pump house engineer to reduce the water level at Sharp Park by .5 feet. Exhibit B, p. 36. Once egg-masses were observed, SFRPD attempted to maintain a water level for Horse Stable Pond that will keep the eggs masses submerged in water.

³ Swaim Biological Incorporated. *Sharp Park Wildlife Surveys and Special Status Reptile and Amphibian Restoration Recommendations*, December 4, 2008, p. 4-4.

Nonetheless, approximately 47 California red-legged frog egg masses were stranded, fragmented, or otherwise taken at Sharp Park between January 27, 2012, and March 8, 2012 (Campo et al., Summary p. 1-4). This is approximately 1/3 of all egg masses observed at Sharp Park between those dates. Stranded egg masses were observed in nearly all portions of Sharp Park's wetland features, including the northern and western portions of Horse Stable Pond, and the northern, eastern, and western portions of Laguna Salada.⁴

This level of take alone would present a fair argument of significant environmental effects from the proposed project. Alarming, when the Pumphouse Project is implemented regulators believe the City will take *virtually all egg masses* laid at Sharp Park each year that it operates—up to 130 egg masses every winter breeding season, roughly equivalent to the entire number of egg masses laid in the frog's most prolific and fecund breeding seasons.⁵

The Pumphouse Project's extraordinary amount of take is a logical consequence of the increased pumphouse operations the project will cause. Dr. Vance Vredenburg, a world-renowned herpetologist based at San Francisco State University has explained why this is so:

[The California red-legged frog] has evolved over millions of years towards a strategy of egg-laying that balances water depth, water temperature, predator avoidance, and pond desiccation. The most successful frogs maximize the contrasting pressures of pond desiccation and water temperature. For example female frogs that choose to lay their eggs in deeper water are minimizing risk to desiccation but also exposing eggs to cooler water temperatures, which translate into slower growth and development. Deeper, more permanent water also harbors a more diverse food web which is more likely to contain aquatic egg and tadpole predators. Females that lay eggs in the shallowest water on the margin of ponds are maximizing growth potential (warmer temperatures) and minimizing exposure to aquatic predators, but are also exposing egg masses to higher probability of desiccation. *If the rains continue and the pond does not dry too quickly the strategy pays off and eggs in shallow water hatch faster, tadpoles grow faster and outcompete other eggs and tadpoles from other frogs laid in deeper water.*

Ponds fill and dry seasonally and although it can seem rather dramatic from wet to dry years, the change over the course of days is not rapid because water levels decrease mostly due to evaporation from heat and use by terrestrial and emergent plants during photosynthesis. The pumping of water to dry up fairways at Sharp Park, however, is well outside the natural

⁴ Campo et al. 2012, pp. 22, 26, 33, 36, 39, 49, 54, 62, 67. Submitted to the Department by Wild Equity during the public comment period and observed in the case file for the Pumphouse Project on October 10, 2013. Wild Equity incorporates these previously submitted documents by reference.

⁵ U.S. Fish and Wildlife Service (USFWS). In Reply Refer To: 08ESMF00-2012-F-0082-2, Formal Endangered Species Consultation on the Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project in San Mateo County, California, October 2, 2012. p. 40.

rate of pond drying and the frogs are not adapted to this type of rapid change in pond depth. Therefore, because these frogs have evolved a breeding strategy over millions of years that is cued in on natural rates of desiccation, the pumping of the ponds by the golf course will inevitable lead to a much higher mortality rate for the eggs that the females lay at the margins of the pond, in the shallowest water.

Vredenburg Decl., p. 11-12 (Exhibit E) (emphasis added). There is a fair argument supported by substantial evidence and expert opinion that clearing vegetation and sediment from Horse Stable Pond and the connecting channel so that water flows to the pumphouse even faster than it does presently will significantly reduce survivorship of California red-legged frog egg masses, a threatened species protected by the Endangered Species Act. This significant environmental effect cannot be ignored: the Department, through a thorough and complete EIR, must consider it.

2. EXPANDING PUMPHOUSE OPERATIONS WILL HAVE SIGNIFICANT ADVERSE EFFECTS ON THE LAGUNA SALADA WETLAND COMPLEX'S HYDROLOGY.

The connecting channel between Laguna Salada and Horse Stable Pond is shallow, with bed elevation ranges between 3.1 and 6.2 feet. When water surface elevations recede below 6.2 feet, Horse Stable Pond and Laguna Salada become hydrologically disconnected. Letter from Greg Kamman, Kamman Hydrology & Engineering, Inc., to Ryan Olah, Chief—Coastal Division Branch, U.S. Fish and Wildlife Service (August 3, 2012) (Exhibit F, p. 4). When the two water bodies are hydrologically disconnected, the pumphouse's ability to drain the Laguna Salada wetland complex is reduced, and the negative environmental affects on the wetland system's hydrologic resources are arrested.

However, the Pumphouse Project proposes to remove 96,948 liquid gallons (480 cubic yards) of sediment from the connecting channel. The portions of the connecting channel to be dredged include the highest point (6.2 feet) along the longitudinal profile of the channel: the area near the culvert passing under the 12th fairway of the golf course.⁶ If this area is dredged, Laguna Salada will remain hydrologically connected to the pumphouse for a greater portion of the year: which will in turn result in expanded pumping operations that drain Laguna Salada's wetland complex. Exhibit F, p. 4.

This increased hydrological connectivity may result in significant adverse environmental effects in one of two ways. First, if the Project Sponsor is correct and the connectivity permits SFRPD to drain the Laguna Salada wetland complex more rapidly and thoroughly, the hydrological resources presently preserved in the Laguna Salada complex will be adversely affected. For example, draining wetlands is known to increase tule and cattail populations, and as these species become more numerous Laguna Salada's open water habitats would decrease in size. Dr. Peter Baye, *Critical Review of the Biological Assessment for the "Sharp Park Safety, Infrastructure Improvement and Habitat Enhancement Project"* May 2012. p. 5 (Exhibit G, p. 9). However, this effect is not considered by the PMND: even though this threat is considered so significant at Horse

⁶ Kamman Hydrology & Engineering, Inc. Report for the Hydrologic Assessment and Ecological Enhancement Feasibility Study: Laguna Salada Wetland System, Pacifica, California, March 30, 2009. p. 16.

Stable Pond that SFRPD is proposing to destroy the frog's cover habitat to create open water breeding habitat.

Second, it is also possible that the Project Sponsor is not correct, and that the Pumphouse Project will actually reverse the flow of water from Laguna Salada to Horse Stable Pond. Exhibit F, p. 4. Kamman Hydrology is the author of the Hydrologic Assessment that the Department relies upon to justify the PMND's hydrology conclusions. But Kamman has explained that SFRPD and the Department are not accurately interpreting his hydrologic study. In his Aug. 3, letter, Kamman explains that storm runoff into Horse Stable Pond is roughly double the amount of storm runoff into Laguna Salada. Because Horse Stable Pond's margin is much more steeply sloped than Laguna Salada, the storm runoff causes Horse Stable Pond's surface level to rise much more rapidly than the surface level of Laguna Salada, which tends to spread outward across its shallow margins, rather than upward. Because of this, initial storm surges tend to drive water from the high-elevation Horse Stable Pond through the connecting channel and into the lower-elevation Laguna Salada. *Id.* at 5.

The practical consequences of this analyses are two-fold: first, removing vegetation from the connecting channel will increase flooding at Sharp Park Golf Course compared to present conditions as waters from Horse Stable Pond are driven into Laguna Salada and extend outward along Laguna Salada's shallow margin. *Id.* Second, as waters flow from Horse Stable Pond into Laguna Salada (and therefore away from the pumphouse), the pumphouse will not function as waters flow away from its intake pipe.

As explained in *Sierra Club v. County of Sonoma*, "if there is a disagreement among experts over the significance of an effect, the agency is to treat the effect as significant and prepare an EIR." 6 Cal. App. 4th at 1316. Here, the expert that prepared the hydrologic study relied upon by the PMND has informed the Department that the Project Sponsor has misinterpreted the expert's results, and provided the Department with the correct interpretation of his expert reports and opinions about the Pumphouse Project's probable impacts. Under such circumstances, CEQA requires the Department to prepare an EIR to fully consider the significant environmental impacts that may arise from the Pumphouse Project.

3. EXPANDING PUMPHOUSE OPERATIONS WILL HAVE SIGNIFICANT ADVERSE EFFECTS ON THE LAGUNA SALADA WETLAND COMPLEX'S WATER QUALITY.

The PMND suggests that Sharp Park's berm was completed in the 1940s and enhanced habitat conditions for California red-legged frogs and San Francisco gartersnakes by "eliminat[ing] the hydrologic connection between the Pacific Ocean and the wetland complex." PMND, p. 3. This suggestion is based on the presumption that Laguna Salada was once a tidal lagoon, influenced daily by ocean tides. Both the suggestion and presumption are inconsistent with the best available science.

Laguna Salada was never a tidal lagoon, nor was it daily or regularly influenced by ocean waters.⁷ The most extensive natural history investigation ever conducted of Sharp Park concludes that

⁷ The City's belief is based on (PWA 1992), which is relied upon to advance proposals in this and other Department projects at Sharp Park. However, the successor of this study—ESA-PWA 2011—thoroughly

Laguna Salada was, under natural conditions, a fresh-to brackish backbarrier lagoon system surrounded by freshwater wetlands, separated from the ocean by a protective dune-like beach system.⁸ Lagoons with these structures and ecological characteristics provide suitable habitat for frogs and snakes throughout the state—as did Sharp Park’s lagoons before the berm was completed in the 1980s.

Aerial photos from the 1940s through the 1980s indicate that Sharp Park’s berm was not completed until after the mid-1980s.^{9,10} Nonetheless San Francisco gartersnakes were recovering at Sharp Park until the mid-1980s.¹¹ The City has previously suggested that an ocean storm surge brought high salinity levels to Laguna Salada in 1986 and alone halted this recovery,¹² but this seems unlikely given the fact that Sharp Park’s California red-legged frog and San Francisco gartersnake populations survived ocean storm surges as large or larger in the 1930s,¹³ 1950s (see Figure 1), and 1970s. Exhibit I, p. 18-19.

The persistence of both species at Sharp Park through 1986 despite (a) an incomplete sea wall and (b) several coastal storm surges that inundated Sharp Park indicates that declines in the late 1980s are unlikely to be attributable to coastal processes. For example, “when aquatic habitat (ponds and streams) is abundant as a result of adequate rainfall, the California red-legged frog can produce large numbers of dispersing young, resulting in an increase in the number of occupied sites. In contrast, the California red-legged frog may temporarily disappear from an area during periods of extended drought.” Revised Critical Habitat for *Rana Draytonii*, 75 Fed. Reg. 12816 (Mar. 17, 2010). From 1987-1992 California faced a severe drought, and “it is possible that the most severe impacts have been on the environment and the fish and wildlife that depend on the

reviewed the 1992 report and determined it was deficient and out of date in numerous ways, ultimately rejecting the 1992 report’s assumptions about the historical condition of the site (ESA-PWA 2011, p. 39-40). The Department’s continued reliance on a discredited report that is more than two decades old—and its complete failure to reference a modern study by the same authors—is a prejudicial abuse of discretion that “precludes informed decisionmaking and informed public participation, thereby thwarting the statutory goals” of CEQA review.” *Al Larson Boat Shop, Inc. v. Board of Harbor Commissioners*, 18 Cal. App. 4th 729, 748 (1993).

⁸ ESA-PWA. 2011 *Conceptual Ecosystem Restoration Plan and Feasibility Assessment: Laguna Salada, Pacifica, California* 39. (available at <http://wildequity.org/versions/3921>).

⁹ *Id.* at 40.

¹⁰ Arup North America. Sharp Park Sea Wall Evaluation, February 5, 2010. Figures 3-7 (Exhibit J).

¹¹ SFRPD. Biological Assessment, Sharp Park Safety, Infrastructure Improvement and Habitat Enhancement Project, August 16, 2012. p. 39.

¹² *Id.* at 31.

¹³ The earliest of these storms occurred shortly after golf architect Alister McKenzie leveled the natural dune-like barrier protecting Laguna Salada from ocean storms. He did so to place several golf links on the beach. All of these links were destroyed in subsequent storms, and eventually the course was redesigned, moving many of these holes to the east side of Highway 1. Exhibit I, p. 18-19.

rivers for their sustenance.”¹⁴ Specifically, the drought severely degraded wetland habitats, and endangered species populations declined significantly.



Figure 1 April 4, 1958 flooding of Sharp Park. Caused by storm water runoff and wave overtopping of berm.
Geomatrix Consultants Feasibility Study, Restoration of Coastal Embankment,
Sharp Park Golf Course, Pacifica, California. November 1987. p. 20.

¹⁴ Dziegielewski, B.; Garbharran, H. P.; Langowski, J.F. Jr. *Lessons Learned from the California Drought (1991-1992)* IWR Report 93-NDS-5 (1993) p. 118.

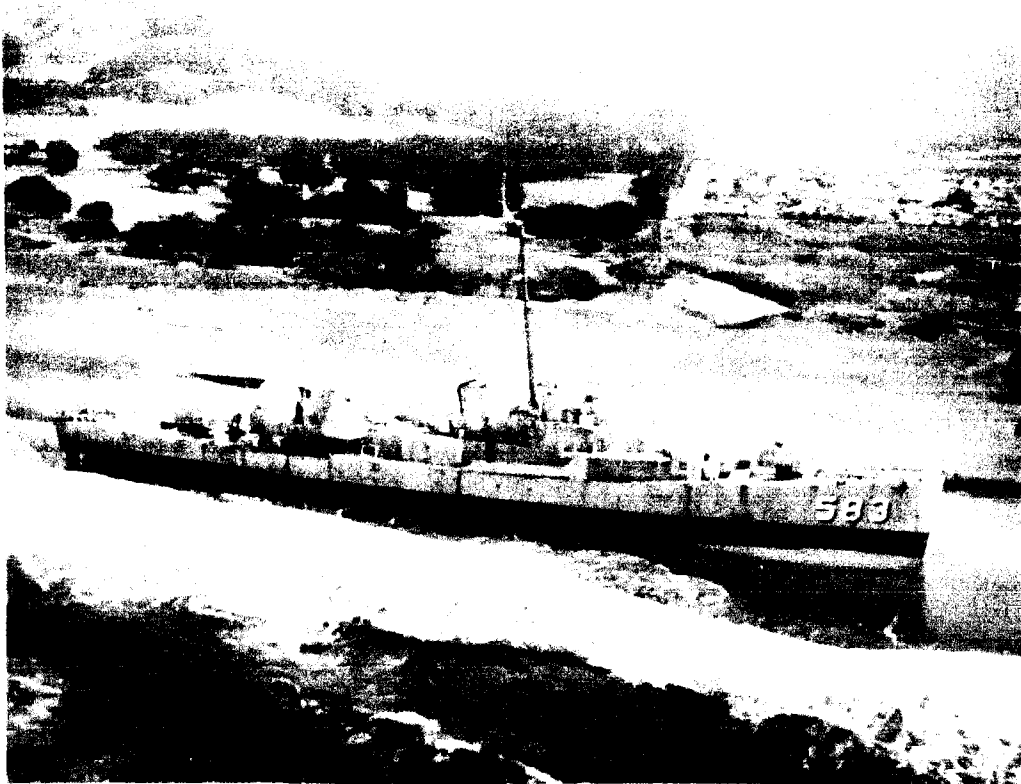


Figure 2 1966 Photo of the USS George Johnson beached at Sharp Park, with no seawall or berm present.



Figure 3. 1972 Coastal Records Project photo showing incomplete berm at Sharp Park.



Figure 4 1979 Coastal Records Project photo showing incomplete berm at Sharp Park.

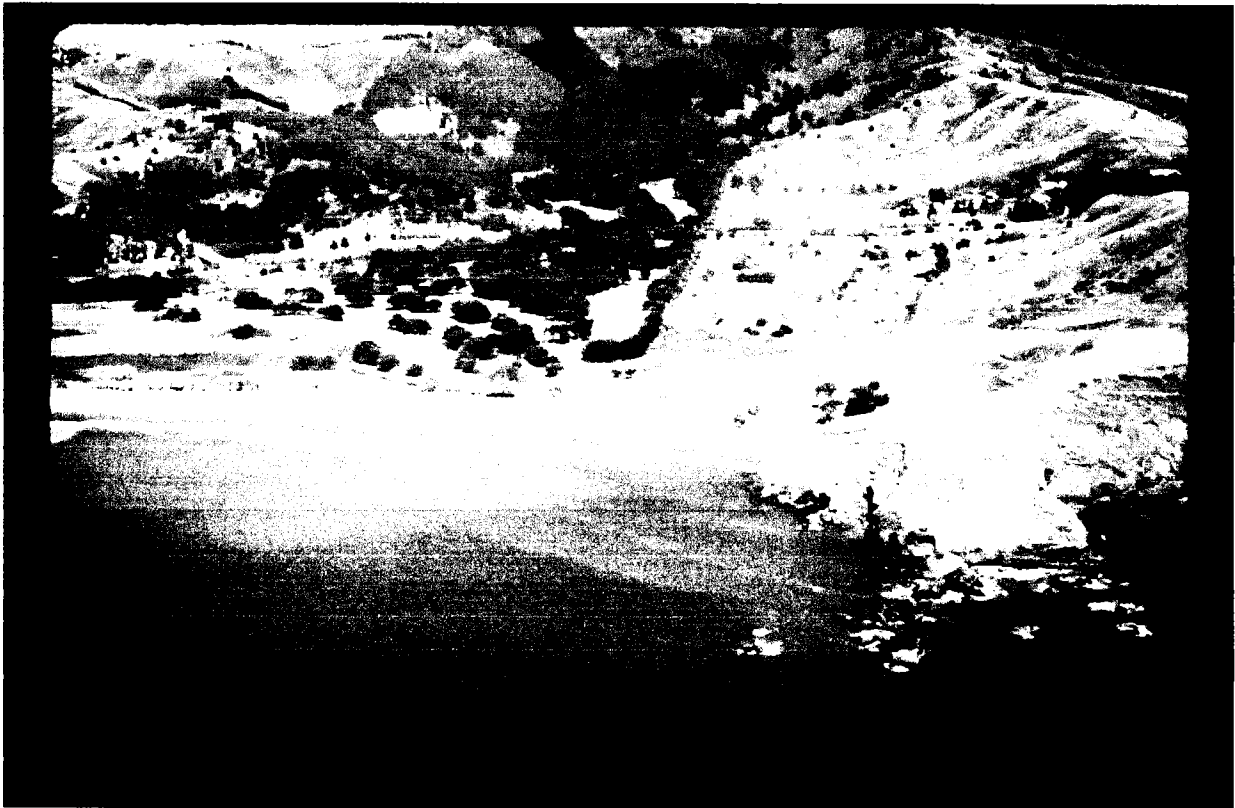


Figure 5 1987 Coastal Records Project photo showing incomplete berm at Sharp Park.

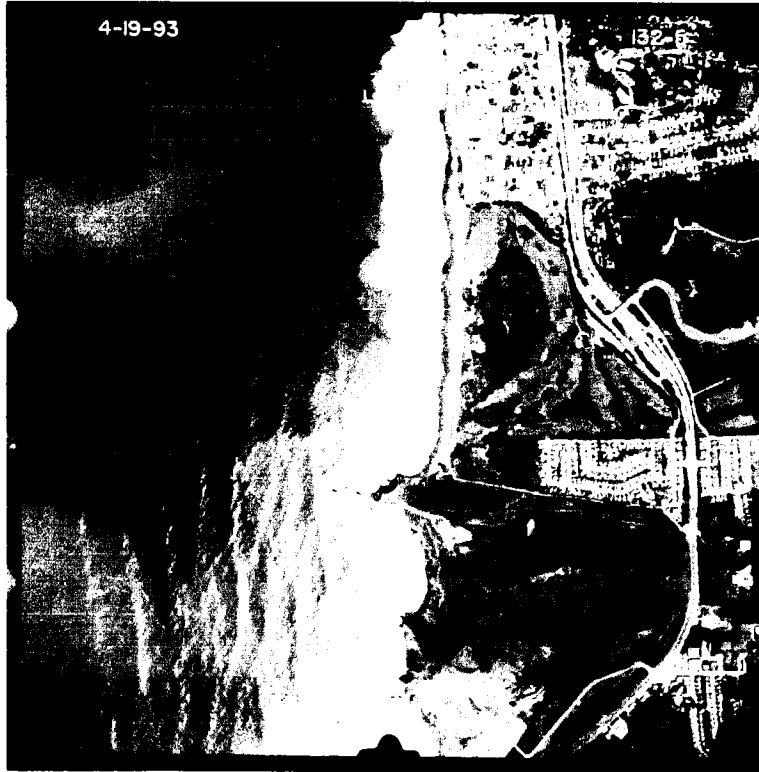


Figure 6 1993 Coastal Record Project photo showing completed berm.

This fundamental misunderstanding of Laguna Salada’s ecological underpinnings has led the Department to overlook significant environmental effects of the Pumphouse Project, and to consider harmful project activities as mitigation measures. For example, retaining the sea wall while pumping Sharp Park’s wetlands will exacerbate, not prevent, saltwater intrusion from the Ocean as marine waters are pulled through the existing groundwater (hydrologic) interface with the Ocean, eventually making the entire lagoon inhospitable to California red-legged frogs (ESA-PWA 2011, p. B-13). Moreover, the project’s dredging proposal, rather than improving breeding habitat for listed species, will put them at risk by encouraging listed species to breed in the areas most vulnerable to pumping-induced saltwater intrusion. *Id.*

Given the substantial evidence that the Department’s basic ecological presumptions are flawed—and the resulting significant environmental effects that were ignored or exacerbated because of this flawed presumption—the Department must consider the best available information about Sharp Park’s natural history and ecology, and ensure that the Project is both biologically and ecologically sound through a complete EIR.

II. THE PUMPHOUSE PROJECT HAS AN UNSTABLE, SHIFTING PROJECT DESCRIPTION, FRUSTRATING INFORMED DECISIONMAKING AND PUBLIC OVERSIGHT OF SHARP PARK.

The project description for the Pumphouse Project “includes elements that are required under a Biological Opinion issued by the U.S. Fish and Wildlife service.” PMND, p. 5. But the project description also segments several of the Biological Opinion’s required elements from the Pumphouse Project. The Department then declares that these segmented elements of the

Pumphouse Project are either categorically exempt from environmental review, or includes the element's effects in the environmental baseline. In either case, the Department is "chopping a large project into many little ones . . . which cumulatively may have disastrous consequences." *Bozung v. Local Agency Formation Commission* (1975) 13 Cal.3d 263, 283-284. Specifically, the action subject to the Biological Opinion has now been segmented into at least three projects for purposes of CEQA: (1) a .5 acre upland habitat restoration project that the Department declared categorically exempt from CEQA on August 5, 2013, thus evading environmental review;¹⁵ (2) pumping operations that the Department deems to be a component of the environmental baseline, thus evading environmental review; and (3) the remainder of the Pumphouse Project: which the Department has refused to review through a complete EIR.

CEQA forbids such "piecemeal" review of the significant environmental impacts of a project. This rule derives, in part, from Cal. Pub. Res. Code § 21002.1(d), which requires lead agencies to "consider[] the effects, both individual and collective, of all activities involved in [the] project." In the instant case, SFRPD declared to the Fish and Wildlife Service just a few months ago that the upland habitat restoration, pumphouse operations, and the rest of the Pumphouse Project was a single action. In response, the Fish and Wildlife Service imposed mandatory terms and conditions on SFRPD in exchange for authorization to kill threatened and endangered species. Those terms and conditions included (1) completing the upland restoration project, (2) operating the pumphouse pursuant to specific protocols, and (3) implementing other terms and conditions for the Pumphouse's construction actions. Thus, each of these three projects have been treated as a "crucial functional element of the larger project such that, without it, the larger project could not proceed." *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70. Indeed, the Biological Opinion expressly states that each element of the project description, reasonable and prudent measure, and each term and condition are "non-discretionary," and must become "binding conditions . . . in order for the [take exemption] to apply." Biological Opinion, p. 39. Thus, these segmented activities are "conditions of approval" for the Pumphouse Project as a whole, and as such it is improper for the Department to segment these elements of the project and evade stringent environmental review. *See Tuolumne County Citizens for Responsible Growth, Inc. v. City of Sonoma* (2007) 155 Cal.App.4th 1214, 1224.

The adverse consequences of this piecemealing is already evident at Sharp Park. Laguna Salada has traditionally been a place for birdwatchers to observe wildlife, and several unique birds have been observed there in recent years. But a few months ago SFRPD removed a fencing project from the Pumphouse Project, and constructed a large fence that eliminated all access to Laguna Salada to watch birds. Similarly, SFRPD attempted to segment a so-called "grading" project for the path along Sharp Park's berm, but then proceeded to place rip-rap and armoring along the berm, resulting in a stop work order from the Coastal Commission.

¹⁵ One practical consequence of the Department's decision to take a condition of approval in the Biological Opinion and implement it in advance of the Pumphouse Project's review is that the upland restoration project can no longer serve as a mitigation or conservation measure for the Pumphouse Project. Instead, it must be considered a part of the environmental baseline for the Pumphouse Project, and provide additional mitigation for the Pumphouse Project's significant environmental effects.

If these project had not been piecemealed, informed decisionmaking with public oversight almost certainly would have prevented these significant environmental effects.

III. THE PUMPHOUSE PROJECT IS INCONSISTENT WITH SEVERAL PLANS, RESULTING IN SIGNIFICANT PHYSICAL ENVIRONMENTAL EFFECTS.

The Pumphouse Project is inconsistent with several plans in ways that either cause significant physical environmental effects or frustrate mitigation measures designed by the Department to ameliorate significant environmental effects. Because of this, the Department must prepare an EIR for the Pumphouse Project.

A. THE PUMPHOUSE PROJECT IS INCONSISTENT WITH THE 1995 AND 2006 SIGNIFICANT NATURAL RESOURCE AREA MANAGEMENT PLANS.

From 2005 until 2011, SNRAMP contained a project-level proposal for Sharp Park's wetland complex, largely based on PWA's 1992 Laguna Salada Resource Enhancement Plan. Although public comments suggested RPD should consider restoring habitat over the entire Sharp Park Golf Course area, the City refused to do so, explaining in 2009 that "[s]hould changes to the Sharp Park Golf Course be proposed, they would undergo a separate regulatory review, including CEQA environmental review."

The Pumphouse Project is inconsistent with the 2005 proposed SNRAMP. The Pumphouse Project will enhance pumping operations at Sharp Park and dredge Sharp Park's Natural Areas to ease the conveyance of water out of the Laguna Salada wetland complex, into the pumphouse, and ultimately out to sea. None of these activities are proposed in the original SNRAMP proposal for Sharp Park. The PMND implicitly recognizes that the Pumphouse Project is inconsistent with SNRAMP, because the Department did not make a consistency finding in the PMND. The Department must therefore be aware that there are significant, unmitigated environmental effects from this inconsistency, and the Department must therefore conduct further environmental review.

B. THE PUMPHOUSE PROJECT IS INCONSISTENT WITH THE SAN FRANCISCO BAY BASIN WATER CONTROL PLAN.

The Pumphouse Project will disturb oligohaline sediments in the Laguna Salada wetland complex, which in turn results in the oxidative formation of acid sulfates. This impact is substantially certain to occur, because experts have directly observed these sediments in the area proposed for dredging: these soils are ubiquitous and conspicuous throughout the wetland complex. Exhibit G, p. 4-5. Experts have also explained the pathway by which the sulfates will harm water quality, wildlife, and endangered species, Exhibit G, p. 10, and explained why these effects will be significant, lethal effects. *Id.*

The primary mitigation measure proposed is M-BIO-2A, which would require SFRPD to disturb sediments outside of the California red-legged frog breeding season. But this is not a sufficient mitigation measure for this threat. First, California red-legged frog tadpoles are known to overwinter before metamorphosing under certain conditions. Exhibit K, p. 2. Thus, it is likely that tadpoles and other sensitive receptors will be present during the dredging activity, even during the frog's non-breeding season. Second, oxidative formation of acid sulfates is a relatively lengthy

process: it can take many days or weeks to occur, and therefore there is no indication in the mitigation measure that there is an adequate buffer to ensure acid sulfates disturbed towards the end of the construction period do not affect breeding frogs.

The Department has also proposed a deferred, byzantine, and ultimately unenforceable mitigation proposal called Mitigation Measure M-BIO-2B to address significant effects of disturbed oligohaline sediments. The measure proceeds through a voluntary, non-binding, multi-step assessment process. As a preliminary matter, the deferral of mitigation until this process is complete is wholly unnecessary, because it is indisputable that oligohaline sediments are present in the Laguna Salada wetland complex. The process eventually concludes with three possible remediation outcomes: addition of lime to the wetland complex, the injection of sodium nitrate into the wetland complex, or the use of suction dredging to reduce the rate of re-suspension of oligohaline sediments.

However, mitigation measure M-BIO-2B is not fully enforceable, and therefore is not adequate to mitigate the significant environmental effects of oligohaline soils. The Department must ensure that “measures to mitigate or avoid significant effects on the environment are fully enforceable through permit conditions, agreements, or other measures.” CEQA Guidelines § 21081.67(b). is not fully enforceable. Public agencies therefore may not defer mitigation measures unless the agency commits itself to mitigation and articulates specific performance criteria or standards that must be met for the project to proceed. *Endangered Habitats League, Inc. v. County of Orange* (2005) 131 Cal.App.4th 777, 793-794. The Department has failed to meet both criteria here. First, there is no commitment to mitigation within the meaning of CEQA. Nowhere does the mitigation measure specify that an authoritative body will mandate the mitigation measures through a permit, agreement, or other measure. Instead, the measure relies upon voluntary reviews and comments throughout the mitigation process. While the fourth and fifth stage of the measure (Toxic Pathways Analysis and Remediation) suggest that either the U.S. Fish and Wildlife Service or the California Department of Fish and Wildlife will “approve” SFRPD’s toxicity standards or its remediation measures, the Department does not identify any permit, agreement, or other measure that could in fact serve as the vehicle for these approvals.

Moreover, the PMND suggests that discharges from Sharp Park’s pumphouse are authorized under an existing San Francisco Bay Region Water Quality Control Board Permit. However, no such permit exists, so it will not be possible to make any provision of this mitigation measure binding through an amendment of any existing permit. Similarly, the Army Corps of Engineers—the action agency for the Pumphouse Projects Section 7 Consultation—to date still has not agreed to incorporate the Biological Opinion into a wetland fill permit issued to SFRPD for this project. Unless and until the Army Corps of Engineers agrees to be bound by the Biological Opinion and incorporate the terms of the Biological Opinion into non-discretionary permit terms, the Army Corps cannot provide the fully enforceable permits or measures that would be necessary to make this mitigation measure lawful.

Second, the mitigation measure does not articulate specific performance criteria or standards that must be met for the project to proceed. There are no thresholds of significance identified, and no other specific measure that would alert the agency or any member of the public that a performance criterion had not been met. Instead, the mitigation measure orders study after study

to occur, but leaves the actual triggers for remediation and the remediation objectives completely undefined.

Moreover, at least one of the remediation measures—suction dredging—will likely cause new and significant environmental effects if it is implemented. Suction dredging will remove large amounts of both sediment and water from the wetland complex—much more than the clam shell or bucket type dredging equipment identified in the project description, which typically contain 80-90% solids. Suction dredging will require distinct technologies to dispose of watery dredged materials: it would not be permissible to allow these waters to drain back into the wetland complex given that they are likely acidic or hypoxic to begin with. Yet the PMND does not discuss any proposed mitigation measure for suction dredging: CEQA requires at least some discussion in situations such as this. *Stevens v. City of Glendale* (1981) 125 Cal.App.3d 986.

C. THE PROJECT IS INCONSISTENT WITH THE COASTAL ACT.

The Coastal Act, as well as Pacifica Zoning Code Section 9-4.4302, defines an “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 activity or developments.”¹⁶ The Act states that “[e]nvironmentally 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.”¹⁷

Sharp Park constitutes an ESHA under this definition because both the CRLF and SFGS are rare, and their presence is regularly documented at Sharp Park; because Sharp Park’s habitats are both rare and especially valuable to these species, because they constitute a rare coastal lagoon ecosystem that is the northern-most known habitat for the SFGS; and because the species and their habitats are disturbed and degraded under existing conditions, and the Project will cause additional degradation and disturbance.

However, the PMND does not recognize ESHA at Sharp Park, nor any of the implications this status has on the Pumphouse Project. Therefore fails to ensure that the Pumphouse Project is consistent with the Coastal Act.

D. THE PUMPHOUSE PROJECT IS INCONSISTENT WITH THE CALIFORNIA RED-LEGGED FROG RECOVERY PLAN.

The Sanchez Creek Watershed is a Priority 2 watershed for CRLF recovery. Priority 2 Watersheds provide the necessary habitat connectivity between core areas and is an important contribution to the recovery of the California red-legged frog throughout its range. These watersheds have Watershed Management and Protection Plans that address, among other things, restoration, controlling water flow, assess suction dredging impacts on water quality and thus the frog (sedimentation increases are cited as a possibility), flood control activities, and recreation activities. Recovery Plan p. 53. The PMND makes no mention of this planning process at all.

¹⁶ *Id.* § 30107.5.

¹⁷ *Id.* § 30240.

E. THE GOLF COURSE REDEVELOPMENT PROJECT IS A PROJECT LEVEL CEQA DOCUMENT, AND DOES NOT MERELY GUIDE MANAGEMENT AT SHARP PARK.

The City's plan to reconstruct Sharp Park Golf Course is reasonably certain to occur, will adversely affect Sharp Park, and is interrelated with this proposal: its effects must therefore be assessed as part of this CEQA process. However, throughout the PMND, the Department suggests that this project level review will merely "guide" management at Sharp Park in the future. This is a significant error, and indicates that the Department must reassess the interrelatedness of these projects and consider them as one project.

1. The City's Golf Course Construction Plan Has Been Significantly Changed.

In 2009, the San Francisco Board of Supervisors unanimously passed an ordinance ordering RPD to study restoration alternatives at Sharp Park. The report RPD ultimately released contained a radical new golf course construction plan for Sharp Park guised as a "recovery" effort for listed species (TetraTech 2009).

After scientists criticized the plan's several significant flaws (Davidson et al. 2011, pp. 1-2), the City convened the fact-finding Sharp Park Working Group (Holland 2011, p. 4-5). When the Working Group released findings that adopted many of (ESA-PWA 2011) recommendations,¹⁸ RPD announced it would abandon a core element of its golf course construction plan—armoring Sharp Park's seawall—but continued to insist that Sharp Park's 18-hole golf course would remain in its historic footprint, even as it acknowledged that sea level rise will erode the seawall and force it inland, squeezing endangered species habitats in a narrow area between the golf areas and the advancing ocean (Holland 2011, pp. 4-5).

Contemporaneously the City was preparing a Draft Environmental Impact Report ("DEIR") for the City's Significant Natural Resource Areas Management Plan ("SNRAMP").

However, when the DEIR was released in 2011 the PWA-based Laguna Salada plan had been replaced with the TetraTech golf course construction plan.¹⁹ Under this plan, 60,000 cubic yards of material would be dredged from the Laguna Salada's wetland complex, creating 12,100,000 gallons of water storage capacity (PRD 2011, p.99). Four golf links surrounding Laguna Salada would be raised by up to 3.5 feet, creating additional (although unquantified) water storage

¹⁸ The penultimate draft of the Sharp Park Working Group's findings did not make any conclusion about Sharp Park Golf Course's integrity or compatibility with the site. However, shortly before its scheduled release, Dave Holland, then director of San Mateo County Parks, leaked a copy of the document to golf advocacy groups (Holland 2011, p. 1-3). These advocates demanded that Mr. Holland "insert something along the following line: 'None of the foregoing is incompatible with preservation of the historic 18 hole golf course that exists on the property.'" *Id.* Mr. Holland agreed to do so, and was able to insert a single line at the end of the document: "These habitat enhancements and golf could be compatible." *Id.*

¹⁹ The plan was attached to the DEIR as Appendix I, and will be referred to throughout this document as (TetraTech 2009) or (RPD 2011) interchangeably.

capacity in the lagoon system (TetraTech 2009, p. 43). Another link would be narrowed, and another removed²⁰ (RPD 2011, Figure 3). It also calls for filling ½ acre of Sharp Park’s wetlands to create an island in Laguna Salada (RPD 2011, p. 99) and landfilling areas where California red-legged frogs breed to “prevent localized ponding” and “to allow more complete drainage to Laguna Salada” (RPD 2011, p. 377).

2. The Golf Course Construction Plan and the Project are Interrelated.

The DEIR’s golf course construction project is interrelated with the proposal here. Both are designed to reduce golf course flooding, and depend upon each other to implement this larger action. The City’s larger plan to reduce golf course flooding is composed of (1) ensuring maximum pump rates are reliably achieved, (2) increasing water flow rates towards the pumps, (3) increasing water storage capacity by deepening lagoons and (4) increasing storage capacity by elevating the rim of the lagoon. If any one of these components fails or is not achieved, pumping rates will decrease and golf course areas will flood.

While there is some overlap, this project is primarily designed to accomplish the first and second elements of this plan (RPD 2012, p. 6) while the DEIR is primarily designed to implement the third and fourth elements of the plan (RPD 2011, p. 99). But the elements are expressly interlinked: the DEIR repeatedly states that the golf course construction project is dependent on efficient pump operations (RPD 2011, pp. 146, 361, 374, 377), and further explains that the golf course construction plan is designed to meet flood control objectives while reducing wear-and-tear on the pumps (TetraTech 2009, p. 43).

The City’s statement that the golf course construction plan is wholly separate from the Project (Wayne 2011b, p. 2) is belied by its recent permitting strategy discussion with other agencies (Anonymous 2012, p. 1). The agenda from this discussion indicates the Project and the golf construction project are two temporal phases of a single management strategy. Effects from the later phases are classic indirect effects, because they are caused by the proposed action and are later in time, but still reasonably certain to occur. They also derive, either directly or indirectly from an interrelated element of the City’s larger flood management strategy. In either case, by law the City must review these effects during this CEQA process, regardless of the City’s colloquial assertion that the projects are separate.

3. The Golf Course Construction Plan is Reasonably Certain to Occur.

The City’s proposal has already been approved by several oversight bodies, and in each case the City made clear that it would not review or consider restoration alternatives at Sharp Park. The City’s single-minded approach to Sharp Park and its completion of many steps in its approval process show that the golf course construction project is reasonably certain to occur.

²⁰ Although Hole 12 will be removed at Sharp Park, the DEIR requires the City to rebuild the link in another location at Sharp Park (RPD 2011, p. 28). The DEIR proposes two locations for this link: west of Laguna Salada, between the seawall and frog breeding areas, or east of Highway 1. The DEIR suggests that surrounding Laguna Salada with golf links would have fewer significant impacts because it would retain historic integrity of the golf course, even though it would negatively affect wildlife and intrude on protected natural areas. However, the DEIR defers the ultimate decision to subsequent environmental review.

The City's proposal to rebuild Sharp Park Golf Course's original layout was endorsed by San Francisco's Recreation and Parks Commission in December of 2009, to the exclusion of all other options for Sharp Park's future (RPD 2011, p. 2). In the SNRAMP DEIR, the City concluded that only an 18-hole Golf Course at Sharp Park was a feasible alternative for the property, and refused to consider other restoration options that would provide additional benefits to listed species (RPD 2011, p. 3). Moreover, the DEIR contains a mitigation requirement that will force the City to rebuild a golf link in one of two places in subsequent environmental review (RPD 2011, p. 28). Thus, the City's existing approvals and contemporaneous permitting procedures create a binding requirement to implement the golf course construction plan.

Furthermore, when the San Francisco Board of Supervisors passed an ordinance requiring the City to negotiate with the National Park Service to implement a restoration plan for the property, the Mayor vetoed the ordinance (Lee 2011, p. 1) again indicating the City's intent to ensure the golf course construction project occurs. And with the City's encouragement, San Mateo County passed a resolution calling for San Francisco to "maximize recreation opportunities" at Sharp Park by implementing the golf course construction plan (San Mateo Co. 2011, p. 2).

These actions by the City are all that is necessary to show that the golf course construction plan is reasonably certain to occur. While there may be some ambiguity about what the ultimate Golf Course design may be the City's CEQA documents must give consideration of the effects of interrelated and interdependent activities whether or not all of the activities' impact is known.

IV. THE CUMULATIVE EFFECTS ANALYSIS IS INADEQUATE.

The Pumphouse Project PMND fails to address the cumulative impacts—or any impacts at all—on the San Francisco garter snake, which has been greatly impacted by the golf course for many decades. This is particularly troubling given Sharp Park's role in the recovery of the species, and SFRPD's failure to aid in that recovery.

V. THE CITY MUST CONSIDER ALTERNATIVES TO THE PROJECT.

The project description does not indicate the City will consider alternatives. In a case like this where public concern and controversy is high, evidence of alternatives is widespread, and when massive take has occurred under existing protocols, the City cannot ensure that there will be no significant adverse environmental impacts without at least considering alternatives to the project proposal.

In particular, (ESA-PWA 2011) contributor Dawn Reiss has contributed a restoration model for Sharp Park that is based on the best scientific data available at Sharp Park and addresses all of the above deficiencies in the project. For example, where the projects suggests that both species are "conservation reliant" due to their isolation, Ms. Reiss' proposal emphasizes connective habitat corridors across Sharp Park.

Where the project suggests it will continue to drain and fertilize Sharp Park's wetlands on the one hand, and then dredge excessive tule and cattail growth on the other, Ms. Reiss' mitigation model constrains pumping so that water levels will rise high enough to drown excessive vegetation

growth, and ensures that water levels rise and fall slowly so that Sharp Park's entire wetland feature remains hydrologically connected and contains sufficient water for egg masses to develop into adult frogs.

Where the project ignores the fundamental changes climate change will bring to this landscape, Ms. Reiss' plan provides mitigation and recovery areas upland and inland from areas that will be immediately impacted by catastrophic flooding events, and then creates natural defenses around these areas by restoring wetlands and vegetative features between the rising sea and the restored habitats. These features will absorb and slow the rate of water if intrusion ever does occur.

Where the project blames the frog for an apparently indiscriminant breeding behavior and for laying eggs in 'unsustainable' habitats, Ms. Reiss' mitigation and restoration plan recognizes that the California red-legged frog can successfully breed under natural conditions at Sharp Park, so long as the velocity, rapidity, and scope of the wetland draining project implemented by San Francisco is curtailed.

All of these outcomes would provide greater conservation and public benefits than the project disclosed in the notification, yet the City does not seem prepared to consider alternatives to the project proposal. Such reluctance is inconsistent with sound environmental review and the strictures of CEQA.

VI. THE PROJECT WILL DESTROY COVER HABITAT TO ENHANCE BREEDING HABITAT, EVEN THOUGH BREEDING HABITAT IS NOT A LIMITING POPULATION GROWTH FACTOR AT SHARP PARK, CAUSING UNNECESSARY AND SIGNIFICANT ADVERSE ENVIRONMENTAL IMPACTS.

The California red-legged frog and the San Francisco garter snake require multiple habitat conditions to survive. For example, "essential habitat for a breeding [San Francisco gartersnake] population includes open grassy uplands and shallow marshlands with adequate emergent vegetation, and the presence of both Pacific tree frog (*Pseudacris regilla*) and California red-legged frog breeding populations." "Emergent and bankside vegetation such as cattails (*Typha* spp.), bulrushes (*Scirpus* spp.), and spike rushes (*Juncus* spp. and *Eleocharis* spp.) apparently are preferred and used for cover."²¹

Similarly, the "California red-legged frog requires a variety of habitat elements with aquatic breeding areas embedded within a matrix of riparian and upland dispersal habitats."²² The frog "spend[s] considerable time resting and feeding in riparian vegetation when it is present" and can be "found up to 30 meters (100 feet) from water in adjacent dense riparian vegetation for up to 77 days."²³ "Overall, [California red-legged frog] populations are most likely to persist where multiple

²¹ U.S. Fish and Wildlife Service (USFWS). Consultation for the Proposed Sharp Park Golf Course Storm Drain Repair Project, Pacifica, San Mateo County, California. 81420-20008-F-1952. October 7, 2008, p. 8.

²² U.S. Fish and Wildlife Service (USFWS). Recovery Plan for the California Red-legged Frog, p. iv. (2002).

²³ *Id.* at p. 13-14.

breeding areas are embedded within a matrix of habitats used for dispersal.”²⁴ Recent studies demonstrate that in both breeding and non-breeding periods, California red-legged frogs predate almost exclusively on terrestrial species, Vredenburg Decl., p. 7 (Exhibit E), indicating uplands are also essential habitat for California red-legged frog prey.

Sharp Park currently provides the habitat mixture both species require.²⁵ However, the project proposal would transform one essential habitat type—emergent vegetation—into open water habitat “to improve water flow to the pumps”²⁶ so Sharp Park’s wetlands can be rapidly drained during the California red-legged frog’s breeding season. The City suggests this transformation is justified because “areas along the connecting channel and [Horse Stable Pond] that contain dense cattail growth are considered to be very low quality breeding habitat for the [California red-legged frog]”²⁷ and presumes the transformation will therefore cause frog populations to increase, ultimately providing more prey for the San Francisco gartersnake.

The City’s position is not supported by available evidence. If, as the City hypothesizes, emergent vegetation limits growth of California red-legged frog and San Francisco gartersnake populations at Sharp Park, the City’s records should show a decline in egg masses as the extent of emergent vegetation has increased. But the evidence indicates California red-legged frog egg mass counts have been generally increasing at Sharp Park/Mori Point since 2004²⁸; indeed, during the 2010-11 breeding season the City “recorded more than 3 times the eggmasses [SIC] than any other year.”²⁹ Similar numbers were observed during the 2011-12 breeding season. Exhibit D, p. 4.

Nor does available evidence indicate that Sharp Park’s San Francisco gartersnake population is limited by prey availability. If Sharp Park’s California red-legged frog population were too small to support its predator, City records should show a decline in adult frogs at Sharp Park. But while testifying against endangered species conservation measures at Sharp Park on behalf of golf advocacy groups, Dr. Mark Jennings stated “it has been common for the past couple of years at Sharp Park to find dozens and dozens of juvenile and adult [California red-legged frogs],” and concluded that “there are relatively few sites within the current geographic range of the species that have such large populations of adult [California red-legged frogs].”³⁰ Furthermore, “trapping

²⁴ *Id.* at 12.

²⁵ SFRPD. Biological Assessment, Sharp Park Safety, Infrastructure Improvement and Habitat Enhancement Project, August 16, 2012. p. 34.

²⁶ *Id.* at 12.

²⁷ *Id.* at 48.

²⁸ *Id.* at 42.

²⁹ E-mail from Jon Campo, Recreation and Park Department Natural Areas Program, to David Kelly, U.S. Fish and Wildlife Service (Jan. 21, 2011) (Exhibit D, p. 5).

³⁰ Jennings Decl., p. 16 (Nov. 18, 2011). However, as pointed out by Dr. Marc Hayes, Dr. Jennings wrongly attributed his observations to Sharp Park Golf Course management and operations. “[I]t is my professional opinion that any increase in egg masses observed in the Sharp Park/Mori Point complex reflects continued increases in recruitment from the Mori Point ponds. Yet because defendants’ activities at Sharp Park are

studies at Mori Point and Sharp Park since 2004 suggest that the [San Francisco gartersnake] population again may be increasing, at least at Mori Point.”³¹ “[C]apture rates for 2006 and 2008 reflected an increase over the 2004 rate of 104% and 5%, respectively . . . we observed an overall increase in the number of [San Francisco gartersnakes] trapped per unit effort within the project area.”³²

While neither the availability of open water habitat nor frog population sizes limits productivity at Sharp Park, the best available science does indicate that egg mass and juvenile *survivorship* limits the California red-legged frog’s population growth “pumping expose[s] California red-legged frog eggs to desiccation,”³³ and that destruction of upland habitats limit the San Francisco gartersnake’s population growth:

Nearly all of the areas surrounding Laguna Salada and Horse Stable Pond are mowed regularly by the Golf Course, very near or immediately adjacent to the wetland edge. This leaves a very narrow band of emergent wetland habitat between the open water areas of the lagoon and the Golf Course links, and no protected upland in which SFGS can bask, breed, or seek refuge in a burrow. Beyond the narrow band of emergent vegetation, SFGS would face a very high likelihood of being taken directly by mowing operations.

Dexter Decl., p. 10 (Exhibit K).

These effects are significant by any measure, and cause adverse environmental impacts that require thorough environmental review and mitigation.

VII. Specific Significant Adverse Environmental Impacts of the Project Proposal.

The following comments are specific to particular elements of the project proposal. Each indicates that there is, at least, a fair argument that the project will cause significant adverse environmental impacts at Sharp Park:

taking the CRLF in several ways, including by adversely altering habitat conditions at Sharp Park, defendants activities are in fact having negative population-level impacts on the entire Mori Point/Sharp Park CRLF population” Hayes Expert Report, p. 26-27 (Jan. 20, 2012) (Exhibit H).

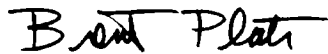
³¹ Swaim Biological Incorporated. *Sharp Park Wildlife Surveys and Special Status Reptile and Amphibian Restoration Recommendations*, December 4, 2008, p. 1-4.

³² Swaim Biological Incorporated. *San Francisco Garter Snake Habitat Improvement Project at Mori Point, Pacifica, California 2004-2008*, January 31, 2009, pp. 14, 19.

³³ U.S. Fish and Wildlife Service (USFWS). *Formal Consultation on the Mori Point Restoration and Trail Plan in the Golden Gate National Recreation Area*, U.S. National Park Service, San Francisco, California. 1-1-06-F-1575 (July 13, 2006) p. 22.

The proposed pumping protocols do not describe the biological screens to prevent listed species from being entrained. Biological monitors at Sharp Park have observed crayfish entrained by Sharp Park's pumping operations, and stated that "[I]f crayfish can become entrained in pump than frogs might also" (Swaim 2008b, p. 1). (Hayes 2012) makes recommendations on screening at Sharp Park.

Sincerely,

A handwritten signature in black ink that reads "Brent Plater". The signature is written in a cursive, slightly slanted style.

Brent Plater

EXHIBIT A



City and County of San Francisco
Recreation and Park Department
Golf Division

McLaren Lodge in Golden Gate Park

501 Starryen Street, San Francisco, CA 94117

TEL: 415.831.6310 FAX: 415.753-7262 WEB: <http://www.sfgov.org>

November 30, 2006

Christopher D. Nagano
Chief - Endangered Species Division
2800 Cottage Way, Rm. W-2605
Sacramento, CA 95825

Dear Chris Nagano:

Your e-mail to the Natural Areas Program of the San Francisco Recreation and Park Department concerning pumping activities at Sharp Park Golf Course was forwarded to me yesterday. You requested that your office be notified as soon as possible should the pumps at Sharp Park be turned on due to flooding. We have not yet had a significant rain event that would cause flooding to Laguna Salada or Horse Stable Pond. We have been pumping down Horse Stable Pond on a controlled basis for the past three weeks and are installing a "by pass" pump to bring down the level of Laguna Salada to hopefully prevent the flooding that occurred last winter. The channel draining Laguna Salada into Horse Stable Pond is completely choked with tules and bulrush which have dramatically slowed the natural drainage from Laguna Salada. Our plan is to increase the water holding capacity of the Laguna Salada basin prior to any large winter storms.

I have been in contact with the Natural Areas group and they are monitoring for Red-Legged Frog activity and egg masses and there have not been any egg masses reported to my office this season. As soon as any egg masses are reported we will follow the protocol established last season keeping the masses hydrated and the water levels above the egg masses until we receive word from the Natural Areas that the hatch is complete.

We are holding a meeting with the City of Pacifica, San Francisco Recreation and Park Department, State Fish and Game and representatives from GGNRA on January 10, 2007 at 10 AM. The meeting will be held at the Calera Creek Waste Water Treatment Plant conference room at 700 Coast Highway in Pacifica. You are invited to attend or send a representative. The Laguna Salada basin is rapidly infilling with tules and bulrush, large areas of water that used to be open are now vegetated and the habitat is being altered to the potential detriment of the Red-Legged Frog, the San Francisco Garter Snake and the San Francisco Forktail Damselfly. We are looking for acceptable solutions and would welcome your expertise.

Sincerely,

Sean K. Sweeney
Golf Program Director

c: Scott Holmes, City of Pacifica
Dave Johnston, State Fish and Game

Mayor Gavin Newsom

CCSF006069

Dennis Kern, Director of Operations, SFRPD
Terry Schwarz, Superintendent, SFRPD
Sus Gardner, Golden Gate National Parks Conservancy
Christopher Campbell, Natural Areas Program, SFRPD

EXHIBIT B

CCSF006070

TOTAL WATER PUMPED FROM SHARP PARK WETLANDS: 12/21/10 – 1/13/12

Date	Water Level at Vault Gauge	Water Level Converted to NAAVD	Small Pump Hour Reading	Large Pump Hour Reading	Water Pumped Since Last Reading in gallons	Total Gallons Pumped Since 12/21/10	Notes
12/21/10	2.6	8.5	140.6	21.8	n/a	0.00	RPD orders station engineer to pump down pond before rains and frog lays eggs.
12/26/10	2.0	7.9	220.8	50.9	15,288,000.00	15,288,000.00	First egg masses observed for the season.
1/6/11	2.1	8.0	411.9	78.1	21,258,000.00	36,546,000.00	RPD moves 16 egg masses. Engineer told to shut pumps off.
1/7/11	n/a	n/a	n/a	n/a	n/a	n/a	RPD moves 28 egg masses.
1/10/11	2.5	8.4	411.9	78.1	0.00	36,546,000.00	Engineer turns pumps back on.
1/11/11	2.1	8.0	427.5	78.9	1,224,000.00	37,770,000.00	Engineer told to raise water levels.
1/14/11	2.5	8.4	427.5	78.9	0.00	37,770,000.00	RPD moves 28 egg masses.
1/21/11	n/a	n/a	n/a	n/a	n/a	n/a	RPD moves 35 egg masses.
2/21/11	3.0	8.9	539.4	174.9	41,274,000.00	79,044,000.00	Snavely finds egg mass at risk at Horse Stable Pond.
2/22/11	2.6	8.5	540.6	197.6	8,244,000.00	87,288,000.00	Bowie observes egg mass stranded at Horse Stable Pond.
2/23/11	2.5	8.4	550.1	209.2	4,746,000.00	92,034,000.00	Dr. Vredenburg confirms stranded egg mass is CRLF.
2/24/11	2.6	8.5	571.3	211.1	1,956,000.00	93,990,000.00	FWS Informed of egg mass stranding.
3/2/11	2.3	8.2	680.2	218.1	9,054,000.00	103,044,000.00	On 3/1/11, Snavely observes stranded Horse Stable Pond egg mass completely desiccated partially frozen.

TOTAL WATER PUMPED FROM SHARP PARK WETLANDS: 12/21/10 – 1/13/12

Date	Water Level at Vault Gauge	Water Level Converted to NAAVD	Small Pump Hour Reading	Large Pump Hour Reading	Water Pumped Since Last Reading in gallons	Total Gallons Pumped Since 12/21/10	Notes
6/24/11	2.6	8.5	1199.4	411.2	100,668,000	203,712,000	Lisa Wayne directs water levels dropped to 2.2.
1/3/12	1.9	7.8	1296.8	413	6,492,000	210,204,000	City orders water level dropped to 1.5.
1/27/12	n/a	n/a	n/a	n/a	n/a	n/a	First egg masses observed this season.
1/28/12	1.4	7.3	1407.5	420	9,162,000	219,366,000	Ely observes egg masses stranded at Laguna Salada.
1/30/12	1.4	7.3	1415.7	420	492,000	219,858,000	Ely informs SBI employees of stranded egg masses they missed during surveys. RPD orders pumps turned off.
2/1/12	n/a	n/a	n/a	n/a	n/a	n/a	Ely returns to observe stranded egg masses, discovers it missing.
2/2/12	n/a	n/a	n/a	n/a	n/a	n/a	Stringer observes more egg masses stranded at Laguna Salada.
2/8/12	n/a	n/a	n/a	n/a	n/a	n/a	Stranded egg masses all removed from Laguna Salada.
2/11/12	1.8	7.7	1415.7	420	0.00	219,858,000	RPD orders pumps on and set to turn off at 1.9.
2/17/12	n/a	n/a	n/a	n/a	n/a	n/a	Ely observes Horse Stable Pond egg mass stranded.
2/29/12	2.0	7.9	1415.7	420	0.00	219,858,000	
3/11/12	2.0	7.9	1416.5	420	48,000	219,906,000	Last Pump House log entry available.

TOTAL WATER PUMPED FROM SHARP PARK WETLANDS: 12/21/10 - 1/13/12

NOTES:

- Hour readings indicate the total number of hours the pump has been running. Numbers derived from Sharp Park Pump House Log.
- John Ascariz, Station Engineer, estimates that the small pump operates at 1,000 gallons per minute (maximum capacity 1,500 per minute) and the large pump at 6,000 gallons per minute (maximum capacity 10,000 gallons per minute). All figures are based on Ascariz estimates, not actual capacity of pumps.
- Pump house vault gauge is not calibrated to any reference point. Kamman 2012 calibrated the instrument and created a conversion factor for NAAVD88 heights.
- Whenever cell indicates n/a, pump engineer did not make a recording for that day.

Page 3 of 3

John Ascariz

San Francisco, CA

December 14, 2011

Page 1

1 UNITED STATES DISTRICT COURT
2 FOR THE NORTHERN DISTRICT OF CALIFORNIA
3 --oOo--
4 WILD EQUITY INSTITUTE, a
5 non-profit corporation,
6 et al.,
7 Plaintiffs,
8 vs. No. 3:11-CV-00958 SI
9 CITY AND COUNTY OF
10 SAN FRANCISCO, et al.,
11 Defendants.
12 /
13
14 Deposition of
15 JOHN ASCARIZ,
16 Wednesday, December 14, 2011
17 Reported by:
18 KIMBERLEE SCHROEDER, CSR, RPR, CCRR
19 License No. 11414
20 Job No.: 33712
21
22
23
24
25

Alderson Reporting Company
1-800-FOR-DEPO

1 A. That's for the small one can't keep up with the
2 runoff that's coming from Sharp Park.

3 Q. Okay. She'll give you a level to set them at.
4 Does she tell you both levels or just the small one?

5 A. You still only have one level. That's
6 maintained in the shutoff at 2.0. The level goes over
7 that, it's just a big pump. That's not the concern, is
8 to try to get out the water, to maintain that 2.0 at all
9 times.

10 Q. So she gives you sort of the lowest number?

11 A. That's where she wants to maintain that level.
12 Anything over 2, we try to get rid of.

13 Q. Right. In terms of setting, I think if I'm
14 understanding, there's sort of three floats. There's
15 the lowest level, there's the shutoff for the small
16 pump, and then there's the turn on for the large pump.
17 Do I understand that right?

18 A. Yes, yes.

19 Q. In terms of the shutoff for the small pump,
20 does she tell you what level to set that at?

21 A. 2.0.

22 Q. That's the lowest level? The next one up I'm
23 trying to understand.

24 A. 2.3.

25 Q. Does she tell you 2.3?

1 A. No. That's our differential that we set that
2 at.

3 Q. Why do you set it at 2.3?

4 A. For you don't short cycle the motor. For if
5 you had the shutoff at 2.0 and had the float at 2.1,
6 that pump would fluctuate and turn on and off in
7 minutes. So you let the water get up a little bit and
8 then the pump kicks on. So it has time to run to pump
9 that water out.

10 Q. Why not have the pump turn on and off every few
11 minutes?

12 A. You'll wreck it.

13 Q. What do you mean?

14 A. You're talking on and off on and on and on
15 multiple times. You have a motor starter. It's not --
16 you try not -- you try to prevent that from happening on
17 motors.

18 Q. So one of the goals is to preserve the motor, I
19 guess; is that right? Trying to make sure the motor --

20 A. Yes.

21 Q. What will happen to it? When you say "wreck
22 it," what does that mean?

23 A. You take a lot of wear and tear out of the
24 motor. You got contacts. You got 260 volts flashing
25 with contactors. You got carbon buildup on the

1 A. Yes.

2 Q. Do you sometimes see water flowing between the
3 two?

4 A. Can't recall. The tulies are there. It's hard
5 to see it. You don't see a big flow. Just filters
6 really slow through all the tulies that are there.

7 Q. Do you see water in the channel?

8 A. Yes.

9 Q. Have you ever looked at the channel and seen
10 there's no water in the channel?

11 A. No.

12 Q. So in your experience, there's always at least
13 some water?

14 A. Yeah, residual water in that --

15 Q. That's what I wanted to ask, whether you knew
16 about the level at which the connection between the
17 Horse Stable Pond and Laguna Salada no longer exists?

18 A. No.

19 Q. You don't know anything about that?

20 A. No.

21 Q. We talked just for a second about how strong
22 the pumps are. You talked about a smaller pump and a
23 larger pump. What is the difference between the two?

24 A. Do you want me to give you a calculation on
25 gallons? We got an estimated small pump, we're going to

1 pump out about a thousand GPM, and large pump --

2 Q. What is GPM?

3 A. Gallons per minute. And large pump, say about
4 6,000 GPM.

5 Q. When the small pump is on, can you see water
6 flowing into the pump?

7 A. If you had something to sight it off of like a
8 piece of tulie floating, very, very slow as it's moving
9 in towards the pump, very slow.

10 Q. How about for the large pump?

11 A. Maybe just speed it up a little faster, not
12 much.

13 Q. Does that change as the sediment builds up near
14 the pump?

15 A. Unclear on what you mean by the sediment.

16 Q. The debris that you talked about.

17 A. Yeah, it would slow it down a little bit, yes.

18 Q. Why do you clear debris for the pump?

19 A. Just for it doesn't work it's way in.

20 Q. To keep it out of the --

21 A. Yeah. You got to keep it till it will
22 actually, here's a screen. It will actually starts
23 here, it will start working its way down here.

24 Q. The debris?

25 A. Yes. Keep that clear.

1 can keep it say estimated say we're going to keep it at
2 1.5, that will stop that golf course from flooding.

3 Q. The lower the number the more it's going to
4 pump?

5 A. Yes.

6 Q. I got that right?

7 A. Yeah.

8 Q. So I guess one thing I'm still trying to
9 understand, if we can, is how the growth of the tulies
10 over time is impacting that number?

11 A. To not let the water come into the pump
12 station.

13 Q. It's keeping the water out of the pump station?

14 A. Keeping it way up above. All those tulies is
15 keeping like a dam and keeping all that water all up in
16 the golf course instead of letting it flow down. You
17 were saying through that channel creek is all grown
18 where it's stopping the water from draining to our pump
19 station.

20 Q. It's your understanding that at some point the
21 pump is no longer draining the golf course; is that
22 right?

23 A. Very slow.

24 Q. Very slow. Okay. And that's gotten worse over
25 time as well; is that right?

1 Q. Right. I think we talked before about what the
2 level is changed over time, say 2.3 --

3 A. Yes.

4 Q. -- at that point, the golf course would start
5 to flood?

6 A. Yes.

7 Q. So if I'm understanding, with regard to the
8 second part again before the frogs laying eggs, the goal
9 that you've been told is to pump low so that the frogs
10 won't lay eggs at a high level because if they did, you
11 would have to maintain the water at that level; is that
12 right?

13 A. Yes.

14 Q. Okay. But in the last winter, for example, the
15 water level did go up; right?

16 A. Yes. I can recall, yeah, to the log book and
17 the water level that year being high.

18 Q. Do you recall seeing the golf course flooded
19 last winter?

20 A. Yes.

21 Q. And why did it flood if you had the pump set at
22 this low level?

23 A. Because all the tulies.

24 MR. CLEMENTS: Objection. It's an incomplete
25 hypothetical. It's vague. You can answer.

1 THE WITNESS: Because the tulies are growing
 2 and stopping our water from coming to the pumps. Then
 3 it floods all out. It's holding the water all out at
 4 the golf course instead of letting it come to our pumps
 5 for we can pump it out.

6 MR. CRYSTAL: Q. As far as you understand,
 7 let's say, were you there at a time -- the problem with
 8 the tulies it's gotten worse over time --

9 A. Yes.

10 Q. -- that you've been there?

11 Again, as best you understand from your
 12 experience, if the tulies were removed, then the pumps
 13 would be able to get the water out more efficiently; is
 14 that right?

15 A. Yes.

16 Q. And do you think that you would be able to keep
 17 the course from flooding if the tulies weren't there?

18 A. Yes.

19 Q. Even in a winter like last winter where there
 20 was a lot of rain?

21 MR. CLEMENTS: Objection. Calls for
 22 speculation.

23 MR. CRYSTAL: Q. Based on your experience.

24 A. Yes. It would do good with the pumps running.
 25 It would pump that water out.

1 level.

2 Q. Right. So if they wanted you to maintain a
 3 certain level, they can tell you to adjust the floats?

4 A. Yes.

5 Q. If the water was below that level, that would
 6 turn off the pumps?

7 A. Yes.

8 Q. If they weren't sure of the level, they might
 9 tell you to shut off the pumps?

10 MR. CLEMENTS: Calls for speculation.

11 MR. CRYSTAL: Q. That's right.

12 A. Yes.

13 (Plaintiff's Exhibit No. 12 was
 14 marked for identification.)

15 MR. CRYSTAL: Q. So giving you what's been
 16 marked No. 12, this is another page from the log book;
 17 is that right?

18 A. Yes.

19 Q. Again, your entries?

20 A. Yes.

21 Q. These are your notes?

22 A. Yes.

23 Q. So if you look at the entry for March 31st, I
 24 just want to talk about the numbers at the end of that
 25 entry where it says, "Small pump and large pump." Could

1 you read that for us?

2 A. "Small pump, 918.5, large pump 407.9."

3 Q. Again, what are those numbers?

4 A. Those are hour meters.

5 Q. That is telling you how many hours those pumps
6 have operated?

7 A. Yes.

8 Q. Is that right?

9 So if you go to the -- actually, do it this
10 way. Give you another exhibit.

11 (Plaintiff's Exhibit No. 13 was
12 marked for identification.)

13 MR. CRYSTAL: Q. Giving you what's been marked
14 No. 13, is this another page from the log?

15 A. M-hm, yes.

16 Q. These are your notes?

17 A. Yes.

18 Q. Is that right?

19 I just want to look at the bottom. You see the
20 entry for December 7th, 2010?

21 A. Yes.

22 Q. At the very bottom of that, see where it says,

23 "Small and large." Can you read those?

24 A. "Small 58.0, large 1.5."

25 Q. So what I wanted to do was compare. If I am

1 understanding right, December 7th, 2010, the reading on
2 the gauge for small pump was 58, and the reading on the
3 gauge for large pump was 1.5?

4 A. Yes.

5 Q. Those are the numbers of hours they had been
6 running; is that correct?

7 A. Yes.

8 Q. If you switch back to page 90 that we were
9 looking at, you read these other numbers, "Small pump,
10 918.5, large pump 407.9," those reflect the numbers of
11 hours they had run as of March 31st, 2009?

12 A. Yes.

13 Q. If you take the number on March 31st and
14 subtract the number on December 7th, for example, on the
15 large pump take the 407.9 hours and subtract the 1.5
16 hours, am I right that would tell you how many hours the
17 large pump ran between December 7th, 2010 and
18 March 31st, 2011?

19 A. Yes.

20 Q. That's approximately 400 hours; right?

21 A. Yes.

22 Q. Am I right during the winter of 2010/11, from
23 early December to late March, the large pump ran for
24 about 400 hours?

25 A. Yes.

1 Q. How about the small pump?

2 A. You're looking at 900 about 30.

3 Q. It was 918 hours on March 31st?

4 A. Yeah.

5 Q. And ran for 58 hours already?

6 A. Right.

7 Q. It's between 850 and 900; is that right?

8 A. Right.

9 Q. That's the number of hours the small pump ran
10 last winter?

11 A. Right.

12 Q. Okay. Just one more of these, and we should
13 take a break.

14 (Plaintiff's Exhibit No. 14 was
15 marked for identification.)

16 MR. CRYSTAL: Q. So another page of the log
17 book, you see that the signature in the middle it
18 says --

19 A. Mark Seigenthaler.

20 Q. Who's he again?

21 A. Mark Seigenthaler, he's my foreman.

22 Q. Does he ever -- does he monitor the pumps at
23 the pump house?

24 A. Not really monitor them. Might go and do a
25 review, overlook them.

RECORD

6/15/10
 Hook at 21 closed
 intake for check logs
 pump 37000
 killing one grazing beam
 to pump house next to
 be removed
 7/16/10 Hook at 18 check building
 and pumps take on
 grazing, close to pump
 house with large beams
 this year will be ok
 on well side
 8/16/10 Hook at 16 same to mud
 with maintenance log
 small pump 27021
 large pump 07042 on
 10/19/10 installed small pump
 no more need for other
 central drops installed
 got getting on bearings
 J. Rogers
 J. Rogers

11/7/10
 (pumps) case for frame
 small pump on post hole
 being removed
 with beam water 5 hook at 20
 J. Rogers
 11/8/10 meet with construction for
 remove well from intake lot
 of work
 J. Rogers
 11/20/10 Hook 21 small pump off
 adjusted float for water
 level to log at 18
 #1 pump from water 30
 #2 pump off line
 J. Rogers
 11/21/10 Hook at 22 pump
 case on beam water
 95
 J. Rogers
 11/22/10 Hook at 21 removed
 old office installed hook
 take on small water
 from water 122
 J. Rogers

11/24/2010 level at 22 drops
 plants to town on small
 pump to pump down to 15
 hour meter 195
 1000

11/25/2010 level at 21 read to
 not plants for small
 pump meter on logan
 hour meter 218
 1000

11/27/2010 level at 21 suppose to
 rain off day, level
 plant to level on small
 pump hour meter 218
 1000

11/28/2010 level at 21 suppose to
 rain report plants to
 back on pump, hour meter
 344
 1000

12/3/2010 installed pump & water
 run pump to test and
 #1106 # 107 # 398
 J. G. Gentry
 J. H. Gentry

12/12/2010 level at 21 near log
 pump for 20 min. hour meter
 13 hour 17, normal level
 checked out, garden and
 night plant, left log pump
 off line when pump log drop
 part low water level, need
 for fall 6" meter out night
 help out small pump on line
 hour meter 474
 1000

12/13/2010 small pump on ground
 level at 18 1/2 hour meter 567
 water to just above water
 pump about off. 569
 1000

12/17/2010 level at 21, came to
 next condition to show log
 level, came from normal pump
 gas check, note small pump
 saw on. was to #107 18
 needs to be lowered, contacts
 will stay and be out, have
 going to look and see
 so we could have some
 number logs 15
 job log

12/18/2010 pump on level at 19
 morning all day small pump
 long, great low water 637
 long pump turned off
 J. Green

12/17/2010 level at 19 pump running
 good water level
 J. Green

12/17/2010 level at 21 ground small
 pump low water 1044
 J. Green

12/17/2010 water level along
 medium on pump days
 no pump last one day
 long water no pump
 call PG&E meet with
 Jim Tall Jim problem with
 new connection on pipe line
 good problem change line
 found water down hole
 going to call out on the line
 at back out 3 more
 J. Green

12/17/2010 power restored
 long pump running 35
 level 3.1 small pump 1333
 330 level at 19 long pump
 morning 136
 J. Green

12/17/2010 level at 16 level
 pumps off large pump 343
 small pump 146.8
 no level at 15 long pump
 just turned off 149.5
 small pump 383
 large pump 1019 J. Green
 small pump start 0.21
 12/17/2010 small pump running
 level at 20 filling on
 rising water by level
 long pump 432
 small pump 1584
 J. Green

12/18/2010 level at 2 & large pump
 on, meet with Dan, present
 report level to 15 in pump
 down good before now and
 large pump stop
 large pump 213, small pump 148.6
 ground small pump
 called outside person clean
 large pump shut off 1.6 251
 level ground to shut off
 @ 1.5
 J. Green

12/17/2010 level at 15 long pump
 pumps off large pump 343
 small pump 146.8
 no level at 15 long pump
 just turned off 149.5
 small pump 383
 large pump 1019 J. Green
 small pump start 0.21
 12/17/2010 small pump running
 level at 20 filling on
 rising water by level
 long pump 432
 small pump 1584
 J. Green

12/30/2010 level at 2.1 big pump running
 12/30/2010 level at 2.1 big pump running
 small pump 72.8
 large pump 274.7
 small pump running 280.7
 level at 2.5
 large pump 74.7
 1st of's New Year
 11/12/2011 level at 2.1 1/2
 small pump running
 small at level last night
 small pump 317.4
 large pump 45.3
 level at 2.0
 large pump running
 against heavy load night
 large pump 75.6
 small pump 339.5
 12/20/11 level at 2.2 small pump running no new load
 next few yesterday
 small pump 361.7
 large pump 27.9
 level at 2.1
 small pump running
 small pump 369.3
 large pump 78.1
 12/20/11 level at 2.2 small pump

12/26/2010 level at 2.0
 small pump running
 level at 2.0
 small pump 215.0
 large pump 50.9
 level at 2.1 small
 pump running against
 out before power intake.
 small pump 320.5
 large pump 50.9
 12/27/2010 small pump running
 level at 1.9 small pump
 level off small pump 229.6
 large pump 50.9
 level at 2.0
 small pump level at 2.2
 large pump 223.6
 level to maintain 2.0-2.2
 level in pool
 small pump 283.3
 large pump 50.9
 12/29/2010 level at 2 3/4 normal
 large but right large
 pump on 61.0
 small pump 264.6
 level at 2.2 large
 pump running very windy
 small pump 268.7
 large pump 66.5

11/12/01 level at 2.2 no pumps
 running noted out intake
 small pump 4037
 large pump 781
 J. Carey

11/12/01 level at 2.5 no pumps
 running checked intake
 small pump 4076
 large pump 781
 J. Carey

11/12/01 level at 2.5 no pumps
 running pump checked intake
 small pump 4279
 large pump 787
 J. Carey

11/12/01 level at 2.5 no pumps
 running not running
 small pump 4364
 large pump 788
 J. Carey

11/12/01 level at 2.5 no pumps
 running small pump 4390
 large pump 788
 J. Carey

11/12/01 level at 2.5 no pumps
 running water in near no
 rain to forest
 small pump 4524
 large pump 788
 J. Carey

11/12/01 level at 2.2 no pumps
 running noted out intake
 small pump 4037
 large pump 781
 J. Carey

11/12/01 level at 2.5 no pumps
 running checked intake
 small pump 4076
 large pump 781
 J. Carey

11/12/01 level at 2.5 found
 pump broken
 small pump 4117
 large pump 781
 large pump in on J. Carey

11/12/01 level at 2.1 pump off
 small pump 4225
 large pump 784
 20000 record call to note
 water level 2.3
 small pump
 small pump 4275
 large pump 789
 J. Carey

2-30-2011 level at 2.5 morning
 slightly
 small pump 477.7
 large pump 78.8
 level at 2.34 started
 morning pump to morning
 small pump 492.5
 large pump 78.8
 golf course
 level at 2.5 no pumps
 morning small pump 507.6
 large pump 78.8
 golf course
 level at 2.4 no pumps
 morning small pump 535.8
 large pump 108.1
 pump
 level at 3.0 top of main
 no rain yesterday lots of
 rain of water from hills
 small pump 538.4
 large pump 174.9
 large pump morning golf course

2-22-2011 level at 2.54 large pump
 morning, no rain yesterday
 small pump 540.6
 large pump 197.6
 golf course
 2-23-2011 level at 2.5 small
 pump morning
 small pump 550.1
 large pump 209.2
 added oil to water golf course
 level at 2.6 small pump
 morning, added with support
 of the large pump, pump
 started
 small pump 571.3
 large pump 211.1
 golf course
 level at 2.6 large pump
 morning, second yesterday
 small pump 520.3
 large pump 214.6
 golf course
 level at 2.4 small pump
 morning, no rain, no rain
 small pump 642.0
 large pump 215.1
 golf course

3-17-2011 level at 2.5 ft
 pump running then shut off
 pump running then shut off
 off at 2.5 ft
 small pump 2181
 large pump 2181
 J. Casey

3-19-2011 level at 2.8 small
 pump running, noted intake
 of saline large pump
 came out ground small
 pump small pump 2285
 large pump 2250
 J. Casey

3-20-2011 level at 2.7 large
 large pump running
 level of note low intake
 checked supports in
 large pump small pump 2317
 large pump 2314
 J. Casey

3-21-2011 level at 2.6 noted
 out tube pipe intake
 large pump running
 checked also ok
 small pump 2323
 large pump 2663
 J. Casey

3-2-2011 level at 2.34 small
 pump running then shut off
 off at 2.3 ft
 small pump 2181
 large pump 2181
 J. Casey

3-6-2011 level at 2.4 small pump
 running running small pump 2154
 large pump 2181
 J. Casey

3-7-2011 level at 2.4 small pump
 running at low small pump 2285
 large pump 2181
 J. Casey

3-9-2011 level at 2.4 ft small
 pump running pulled
 float up to shut off
 pump, rest float in
 tank off at 2.50 tall
 small pump 2181
 large pump 2181
 J. Casey

3-13-2011 level at 2.5 small
 pump shut about off
 small pump 2181
 large pump 2181
 J. Casey

3-27-2011 level at 2.7 small
 pumps running. small pump 430
 large pump 450
 J. Quigg

3-22-2011 level at 2.6 large
 pump running. no
 heavy lift night
 small pump 454.5
 large pump 457.1
 J. Quigg

3-20-2011 level at 2.74 large
 pump running. no
 out. filter from intake
 small pump 455.9
 large pump 471
 J. Quigg

3-31-2011 level at 2.6 small
 pump running. no
 out. filter added oil.
 in use in large pump
 small pump 418.5
 large pump 407.9
 J. Quigg

4-4-2011 level at 2.5 1/2
 no pump running
 added gas intake
 small pump 432.8
 large pump 401.8
 J. Quigg

3-27-2011 level at 2.7 small
 pump running. small pump 430
 large pump 450
 J. Quigg

3-22-2011 level at 2.6 large
 pump running. no
 heavy lift night
 small pump 454.5
 large pump 457.1
 J. Quigg

3-24-2011 level at 2.74 small
 pump running. no
 out. intake of filter
 large pump runs on
 small pump 460
 large pump 472.2
 J. Quigg

3-25-2011 level at top of marker
 3.3 now large running
 added oil. filter
 from 2.74
 small pump 467.5
 large pump 412.2
 J. Quigg

Level at 2.6
 noted out Xylene from
 safety area. pipette
 empty. now checked
 oil in large pump see
 small pump 10832
 large pump 4078
 J. Casey

5-18-2011
 Level at 2.6 noted
 out intake of tubes
 are checked small and
 large pumps off
 small pump 1127
 large pump 4079
 J. Casey

5-26-2011
 Level at 2.6 found intake
 screen small pump 1127
 large pump 4079
 J. Casey

6-10-2011
 Level at 2.6 found out
 taking down intake are checked
 small and large pump
 large pump 4113
 small pump 1196.0
 J. Casey

6-24-2011 account email paper
 from urgent to stop level for
 2.2 found problem to
 2.2 not work large pump
 see on small pump 1127
 large pump 4113
 J. Casey

7-8-2011 age stopped pump
 status all ok
 Gaffin on intake with
 work put in work order
 to pump
 small pump 12408
 large pump 4116
 level at 2.3
 J. Casey

8-30-2011 age checked pumps
 new for two are level at
 small pump 012408
 large pump 092116
 J. Casey

10-3-2011 level at 1.7
 Small Pump 1240.9
 lg. pump 411.6
 Drilled holes for grease fitting access.
 & ops checked fittings
 J. Acary

10-20-2011-16:00
 Water level @ 1.875
 Small Pump Hours 1255.7
 Large Pump Hours 411.6
 Removed log book for phone copying
 M. Slegen

10-24-2011 Returned Log book to Mari Pump Station
 Water level @ 1.860 Pump hours same
 M. Slegen

11-6-2011 level at 1.9 rained last
 night small pump 01257.8
 large pump 00411.6
 J. Acary

11-17-2011 ops checked pump
 house. level @ 1.7
 small pump 1260.0
 large pump 0411.6
 J. Acary

12-8-11 level at 1.9.
 small pump @ 1296.8
 large pump @ 412.9
 J. Acary

12-18-2011 returned log book
 level at 1.9 floats set
 to turn off pumps at 2.0
 small pump 01296.8
 large pump 412.9
 J. Acary

1-3-2012 received call from
 Steve Flammery to lower floats
 to lower water level down to
 1.5. dropped floats down
 large pump came on then
 set it to 1.5.
 water level at 1.7
 small pump 1296.8
 large pump 413.0
 only set in large pump
 to stop every 65 sec. ground
 small pump
 J. Acary

1-4-2012 level at 1.8
small pump 1298.9
large pump 413.2
there are so many tubes
they are holding the water
back from coming into
the pump house. turned
on large pump to hand.
then turned off pump and
set to auto. J Acary

1-5-2012 level at 1.7
small pump 1301.8
large pump 414.4
ran large pump in hand
for 20 min to bring down water
level to 1.5 scabed marker
so it is readable. greased
small pump J Acary

1-8-2012 level at 1.7
small pump 1307.1
large pump 414.4
J Acary

1-9-2012 level at 1.7
small pump 1308.9
large pump 414.4
raked intake
J Acary

1-11-2012 level at 1.7
readjusted floats to pump
water down to 1.2
the tubes are holding water
back need to clean pathway
small pump 1309.4 J Acary
large pump 419.8 J Acary

1-13-2012 level at 1.3 ^{21.0}
small pump 1320.8
large pump 414.8
J Acary

1-17-2012 level at 1.3
small pump 1327.8
large pump 414.8
greased small pump
raked intake
J Acary

1-21-2012 level at 1.3
raked out intake.
small pump 1343.0
large pump 418.9
rained last night
J Acary

1-22-2012 level at 1.4
small pump 1370.0
large pump 420.0
greased gate raised
set intake
J. Acary

1-28-2012 level at 1.4
small pump on
small pump 1407.5
large pump 420.0
J. Acary

1-30-2012 level at 1.4
small pump 1415.7
large pump 420.0
turned small pump
and large pump off
per Steve Flannery request
J. Acary

2-11-2012 level at 1.8
was told to turn pump
on and set float level
to turn off at 1.9
per log Wagon request
small pump 1415.7
large pump 420.0
J. Acary

CCSF097030

2-15-2012 level at 1.9
cleaned intake checked
oil in large pump
greased small pump
small pump 1415.7
large pump 420.0
J. Acary

2-29-2012 level at 2.0
intake clean
small pump 1415.7
large pump 420.0
ops checked pumps J. Acary

3-12-2012 level at 2.0
cleaned intake
small pump 1416.5
large pump 420.0
J. Acary

CCSF097031

EXHIBIT C



Philip Williams & Associates, Ltd.
Consultants in Hydrology

Pier 35, The Embarcadero
San Francisco, CA 94133
Phone: (415) 981-8363
Fax: (415) 981-5021

LAGUNA SALADA RESOURCE ENHANCEMENT PLAN

Prepared for:

The City of San Francisco
and
The State of California Coastal Conservancy

Prepared by:

Philip Williams & Associates, Ltd.
Wetlands Research Associates, Inc.

and

Associated Consultants:

Todd Steiner

John Hafernik

June 1992

#621

ENVIRONMENTAL

Environmental Hydrology Engineering Hydraulics Sediment Hydraulics Water Resources

Wharton et al. (1987) noted other occasional prey to include earthworms, leeches and pond snails, and a previously killed rodent. Although Wharton et al. (1987) did not quantify age-specific food habits of the SFGS, they mention newborn snakes taking fish, but suggest that fish may be taken only when no other appropriate size food items were available. McGinnis (1986b) reported that a newly born snake from Mori Point taken into captivity would only eat small worms and young of the year California slender salamanders (*Batrachoseps attenuatus*).

iii. Competition

Competition between SFGSs and conspecifics has been considered to be an important factor in the recovery of the SFGS (McGinnis 1984, 1986; USFWS 1990). However, no data exist to support this contention. Competition between snake species has rarely been demonstrated (Reichenbach and Dalrymple 1980), and has not been shown to occur between SFGSs and other closely related species and subspecies.

McGinnis (1986a) emphasized the importance of competition in the recovery of SFGS because he reports that he has never found SFGSs when "(A) a pond frog species was not present, and (B) when the two other coastal garter snake species were present." However, Jennings (pers. comm.) reports finding RLF, both coast and Santa Cruz garter snakes at all locations where he has observed SFGSs (Pescadero, Waddell, Ano Nuevo). Sean Barry (pers. comm.) has reported similar results for a number of sites he investigated. Of the ten sites where Fox collected SFGSs, all three species of garter snakes were collected at five sites, two species were collected at three sites and only SFGSs were collected at two sites. The semi-aquatic habitat and food habits of the SFGS suggest that it is intermediate ecologically between the more aquatic Santa Cruz garter snake and the more terrestrial coast garter snake and may be more likely to be found when the two conspecific species are present.

iv. Mortality

SFGSs are known to be killed on the roads (Sean Barry, pers. comm.) and in mowing operations (Dalrymple and Reichenbach 1984). Mortality from vehicles and mowing operations are considered important mortality factors which can be reduced by proper management as demonstrated for endangered garter snakes in Ohio and endangered rattlesnakes in Missouri (Siegel 1986).

No known predator specializes on garter snakes in the study area. Carpenter (1952) and Fitch (1965) report a number of garter snake predators which are found in and around Sharp Park including several hawks, herons, racers (*Coluber constrictor*), raccoons (*Procyon lotor*), skunks (*Mephitis mephitis*) and opossums (*Didelphis marsupialis*). Foxes (presumably the introduced red fox, *Vulpes fulva*, a specimen which was positively identified from a dead animal seen in nearby Calera Creek, although grey foxes, *Urocyon cinereoargenteus*, are native to the area) were seen in Sharp Park and are also common in the area. Carpenter

(1952) also reported large crayfish and frogs as garter snake predators. Large crayfish, presumably an exotic species from Louisiana (Mark Jennings, pers. comm.) are common at Sharp Park.

c. Distribution

The SFGS is restricted in geographic distribution to San Mateo and northern Santa Cruz counties and only a few viable disjunct populations are still known to exist (USFWS 1985). Beginning in 1946, Sharp Park has been surveyed for SFGSs several times. The results of these surveys indicate that in the mid-40's SFGSs were abundant, but that by the late 70's the population was greatly diminished. Barry (1978) suggested that their depleted numbers were primarily the result of commercial collection for the pet trade, based on interviews he conducted with reptile dealers. However, in 1979 Barry (1979) located thirty seven SFGSs in the wetland area adjacent to Horse Stable Pond and 46 SFGSs were observed on Mori Point, primarily in the "bowl" area. Barry hypothesized that... "the bowl is apparently of considerable importance to perhaps the entire Laguna Salada [SFGS] population..." and stated that the small number of recaptures of individuals in the bowl area suggests that the snakes were primarily using the area as a migratory corridor.

McGinnis made five different surveys of Sharp Park and Mori Point between 1984 and 1989. In several hundred survey-hours and thousands of trap-hours, only two SFGSs were observed; one giving birth and another lone adult, both on the far western end of Mori Point.

d. Occurrence at Sharp Park and Adjacent Areas

i. Methods

Surveys conducted during this study consisted of walking systematic transects around Laguna Salada, Horse Stable Pond, connecting canals and adjacent marshes and the creek. In addition, all unmowed areas were surveyed at least twice. All species of reptiles and amphibians encountered were recorded. Following winter rains, the study area was surveyed for the presence of temporary ponds. Surveys were conducted between May 1990 and May 1991. In addition, a reconnaissance survey was performed in January 1992. Sixty-eight hours were spent in Sharp Park (includes Laguna Salada, greater golf course area west of Highway One including Sanchez Creek, Horse Stable Pond and stable area) and thirteen hours were spent on Mori Point. No traps were used during this study.

Habitat was assessed qualitatively for availability of food, cover and over-wintering sites. In order to provide historical perspective in habitat changes over the last two decades a one-day survey was conducted with Sean Barry (University of California, Davis), who had previously studied the status of SFGSs at Sharp Park in the 1970s. In addition, a half-day was spent in Sharp Park east of Highway 1 following the creek up through the rifle and archery range, and site visits were made to Pescadero Marsh, San Francisco Airport and

Ano Nuevo to view additional habitats presently in use by SFGSs. Common and scientific names for reptiles and amphibians used in this report are those of Collins, et. al. (1978).

ii. Results

1) Present Status

No SFGSs were located in Sharp Park, but three juvenile SFGSs were found at Mori Point: two together on surveys in 1990-1991 and one in January 1992 (Figure 34). Two hundred ninety seven observations of garter snakes were made in Sharp Park. All positively confirmed sightings were of the coast garter snake (*Thamnophis elegans terrestris*). Approximately 40 garter snakes moved out of view before a positive identification could be made.

Although no SFGSs were located at Sharp Park proper during this study, Laguna Salada, Horse Stable Pond, the connecting canals and associated wetlands are most probably important feeding areas for existing SFGSs which still occur in the vicinity. The lack of observations suggests that populations remain significantly reduced compared to the historical records of Fox in the 1940s and Barry in the 1970s (1978, 1979). A number of factors have been identified as possible reasons for the decline (McGinnis 1986a, USFWS 1988) and are discussed below.

2) Prey Abundance

Small choruses of Pacific tree frogs were heard both day and night following winter and spring rains but no tadpoles or egg masses were located. No more than five tree frogs were found on any given survey around Horse Stable Pond and the connecting canal. Tree frogs were heard calling near a drainage ditch that runs off the golf course into Laguna Salada on its east side, but none in or around Laguna Salada itself.

The only earthworm and salamander populations were located under the isolated debris in patches of Monterey cypress. Whether earthworms are numerous in the soil under the golf course grass was not determined. Slugs were common in marshes and were found in the stomachs of numerous coast garter snakes. Small fish were common along the edges of Laguna Salada, Horse Stable Pond, Fairway Drive Creek and the connecting canal.

Additional feeding areas are present south across Mori Point to Calera Creek; these areas contained prime feeding habitat (McGinnis 1990) that was severely degraded recently, but is in the process of being restored (Michael Vasey, Pacifica City Council and San Francisco State University, pers. comm.). Mori Point may also provide alternative feeding sites at temporary ponds that form after heavy rains during winter and spring. McGinnis (1986b) previously reported a lack of salamanders on Mori Point except at one location at the far western end of Mori Point, but the present study recorded an abundant supply of slender salamanders, earthworms and slugs during the wet conditions of winter and spring.



Figure 34 Location of SFGS sightings from present study (square), McGinnis, 1986b (triangle), and Barry, 1978b (circles indicate single sightings, solid line denotes area of multiple sightings)

The large-scale salt water intrusion into the lagoon and pond during the mid-1980's undoubtedly caused amphibian populations, SFGS primary prey, to decline sharply. Once viable, reproducing frog populations are reestablished, the area will provide much greater foraging habitat for SFGS.

3) Habitat Assessment

Overall size of marsh habitat at Sharp Park has not changed dramatically since Barry's study in 1978 (Sean Barry, University of California, Davis, pers. comm.), although several years of drought conditions probably have reduced hydroperiods significantly during the last five years. McGinnis's (1986a) description of Laguna Salada proper also mirrors present conditions

Laguna Salada proper provided partial cover for snakes along most of its margin, except for open sandy areas along the western side. The abundance of aquatic organisms appeared to decrease as one moved from south to north, and this included frogs, fish, and aquatic insects. In general, prey levels of frogs were low, although small fish were common.

The connecting canals provide good cover for SFGSs and frog and fish prey availability. They also provide cover for movements between Laguna Salada and Horse Stable Pond. McGinnis rated the canal areas connecting Laguna Salada and Horse Stable Pond as prime SFGS habitat, and this area also provided significant numbers of sightings of coast garter snakes during this study. Good cover and abundant prey items suggest that this area remains important feeding habitat for SFGSs. Presumably, the canal also provides migratory paths for snakes from Laguna Salada south to Horse Stable Pond and Mori Point.

Sanchez Creek provides adequate cover for SFGSs along its western terminus where it meets Horse Stable Pond. In other areas the creek either passes underground or is overshadowed by dense cypress and has little or no vegetation. In these areas, Sanchez Creek provides poor frog and fish habitat and little SFGS cover.

Horse Stable Pond provides good cover for SFGSs along its southern edge. The northern and western edge of the pond had adequate cover at the beginning of the study, but winter freezes followed by heavy storms reduced cover significantly. By summer of 1991, new vegetation provided adequate cover. Horse Stable Pond had the highest concentration of frog and fish prey items and provides excellent feeding habitat for SFGSs.

No natural upland habitat, which is now believed to be important to SFGSs (McGinnis and Keel 1987, USFWS 1988), exists on the golf course west of Highway One. The artificially created berm which separates the Pacific Ocean and the golf course currently has little vegetation on it and does not now appear to support any small mammal burrows which are thought to serve as overwintering retreats (McGinnis 1988).

Mori Point is separated from Horse Stable Pond by an abandoned stable area which contains a ring of tires, old barns and a number of old bathtubs. At the time of this study, the area is overgrown with grasses reaching a height of three feet and provides a dispersal corridor for SFGSs onto Mori Point and excellent foraging habitat. This upland area is the only upland habitat within Sharp Park and is an important habitat for SFGSs and the other special status species.

The privately owned uplands on Mori Point are critical to SFGS. These uplands provide overwintering sites, a corridor between Sharp Park and Calera Creek, and alternative feeding areas. In fact, since Barry (1978) located two SFGSs at Sharp Park, subsequent surveys have only located snakes on Mori Point uplands and at Calera Creek on the southern side of Mori Point. USFWS (1985) stressed the need to understand movements and activity patterns to properly manage the SFGSs. Site specific movements and activity patterns for Sharp Park remain unknown, except those reported by Barry (1979) that suggest that SFGS movement between the southern marsh area at the east end of Horse Stable Pond onto Mori Point.

The population status of the SFGS at Sharp Park remains critically low following heavy collection pressures in the 1970s, marine intrusion and drought conditions in the 1980s and the continued degradation of adjacent upland and feeding habitats at Mori Point and Calera Creek. The success of enhancement plans for the recovery of the SFGS at Sharp Park is intricately tied to protection and recovery of these adjacent habitats.

Although no SFGSs were found in Sharp Park during the present survey, the area probably serves as an important feeding habitat for the small population of SFGSs of the region, including those located on Mori Point. Furthermore, Horse Stable Pond, Laguna Salada and the connecting canal currently support RLF, the most often mentioned prey item for the SFGS.

3. Red-legged Frog

a. Introduction

The red-legged frog (*Rana aurora draytonii*) is a Federal candidate species for listing under the Federal Endangered Species Act (Federal Register, January 6, 1989, Volume 54(4):554-579) and will probably be recommended for federal listing within one year (Mark Jennings, California Academy of Sciences, pers. comm.). It is also considered a species of special concern by California Department of Fish & Game.

b. Natural History

RLF feeding habitats have been the subject of quantitative analysis (Hayes and Jennings 1989). These investigators found RLFs were found in aquatic habitats that included "some area with water at least 0.7 m [2 feet] deep, [and that] had a largely intact emergent or shoreline vegetation." Shrubby willows (*Salix* sp.) were recorded at 67% of the sites. Adult frogs seemed especially sensitive to the need for dense vegetation and deep water as only juvenile frogs were found at sites where vegetation and water depth were limited.

c. Occurrence on Site

i. Methods

Between May 1990 and May 1991, four surveys (7 hours) were spent at Sharp Park after dark surveying for frogs that are primarily active at night (Mark Jennings, California Academy of Sciences, pers. comm). Special attention was given to RLFs, a federal candidate species, which may be an important prey species of SFGSs. One survey for RLFs was conducted in November with Drs. Mark Jennings and Marc Hayes, who have both been involved in extensive studies of this species, and are presently determining its status in California under contract to California Department of Fish & Game.

ii. Results

On warm days throughout the study period, juvenile RLFs were common around Horse Stable Pond and along the connecting canal. Up to 100 juvenile frogs were counted around Horse Stable Pond during one survey in May, undoubtedly a small fraction of actual number of frogs present. In comparison, less than 20 frogs were counted around the west, north and southern end of Laguna Salada proper, an area vastly larger than the small Horse Stable Pond. RLFs were rarely seen along Sanchez Creek, although some individuals were located under debris and in some temporary ponds near its terminus with Horse Stable Pond.

Adult RLFs are nocturnal and few were seen during nocturnal or diurnal surveys, although one large individual was located along the connecting canal. No choruses of RLFs were heard and no egg masses or tadpoles were seen during the surveys in 1990 and 1991. However, in March 1992, following a month of significant rainfall, numerous RLF egg masses were found at Horse Stable Pond. The pumping of water out of Horse Stable Pond and the resultant exposure of shoreline was causing massive frog egg mass mortality.

The small number of adult RLFs present in Laguna Salada and Horse Stable Pond suggest that either the present frog population is relatively new and/or few breeding sites are available. Both are probably true. McGinnis reported no frogs in 1986 and five years of drought have reduced the reproductive success of this species at many sites (Mark Jennings,

pers. comm.). Much of the present sites at Sharp Park do not offer adequate vegetative structure for breeding (Hayes and Jennings 1989; Mark Jennings, pers. comm.), for example, Sanchez Creek is currently too shallow and does not provide adequate vegetational structure to support RLF. Despite significant rainfall in 1991, no tadpoles or eggs of this species were located.

The low number of RLFs in Laguna Salada may also be due to inadequate vegetational structure and shallow water conditions (< 2 feet) along the edges of the lagoon. The possibility also exists that predatory fish are present in Laguna Salada. Sweeney (Sharp Park superintendent, pers. comm.) noted reports of bass in Laguna Salada, although he had no first-hand observations. Hayes and Jennings (1989) mentioned the elimination of RLFs at many locations following introduction of predatory fish.

Red-legged frogs are "explosive breeders", reproducing in a very short period of time following heavy rains as occurred in February 1992. The frogs by their eggs near the water surface attached to emergent vegetation. This reproductive behavior is disastrous with the present system of pumping down water levels following large rains. Egg masses are then exposed and desiccate. Those that hatch may be pumped out to sea as indicated by the large numbers of fish pumped out in 1991. Hence, either water should be held in the system consistent with flood constraints or pumped out the north end of the lagoon.

4. San Francisco Forktail Damselfly

a. Introduction

The San Francisco forktail damselfly (*Isonura gemina*) has the most restricted distribution of any western damselfly or dragonfly. The FTDF is associated with coastal and San Francisco Bay wetlands. Prior to human impacts on these areas, it probably was associated primarily with sluggish freshwater streams and marshes. Such wetland areas are now seriously threatened by urbanization, channeling of creeks, and other human activities. Because of threats to its survival and its association with threatened biological communities, this species is a Category 1 federal candidate for listing as an endangered or threatened species. It is also listed by the International Union for the Conservation of Nature (IUCN) as an endangered species. Recently, it has been used in a photo-essay as a symbol of threatened California invertebrates (Middleton 1988) and was included in an exhibition of photographs (Sikling Towards Extinction: The Disappearing Wildlife of California) co-sponsored by the California Academy of Sciences and the Nature Conservancy.

Current concern centers around the negative effects that rapid changes in Bay Area wetlands are having on this species. Most of its habitats have been greatly altered or eliminated. These alterations probably greatly restrict the area that can support this species, and threaten the existence of many colonies. In the past 12 years many colonies have been extirpated by development and habitat alterations (Hafertik, pers. obs.). Hybridization with closely related species in areas highly disturbed by humans also pose a significant threat to

IV. SUMMARY OF OPPORTUNITIES AND CONSTRAINTS

The existing conditions described in the previous section represent both opportunities and constraints for enhancement.

From a hydrologic perspective, the historical transition from a saline or brackish wetland to fresh water has allowed the development of endangered species habitat. Past ocean wave incursions represented catastrophic reversals back to saline conditions. The recent completion of the seawall should greatly reduce future catastrophic changes. However, these may still occur, and the opportunity exists to develop a response plan should ocean incursion recur.

Existing water sources are generally capable of sustaining a viable wetland. Late-summer dry periods have resulted in low water levels. In conjunction with some shallowing due to sand input from wave overwash, emergent vegetation is encroaching into previous open-water areas. Better water management and dredging of some areas could restore open water areas.

The present water discharge system (pumps and gravity culvert) is old and has deteriorated. A modern larger-capacity system would reduce flooding and improve water management. However, periodic high water levels from freshwater flooding primarily affects the golf-course operation. If sufficient upland refuge is available, vegetation and wildlife species will survive. Thus, major expenditures on flood control facilities are probably not warranted solely on the basis of wetland enhancement.

Biologically, four special status species are known to occur on or near the Sharp Park study area: San Francisco garter snake (SFGS), red-legged frog (RLF), San Francisco forktail damselfly (FTDF), and salt marsh yellowthroat (SMYT). The four special status species generally have compatible habitat requirements and therefore none of the proposed manipulations would result in decreased habitat values for any one species. The SMYT, FTDF and RLF are currently present albeit in relatively low numbers. The SFGS was historically found at Laguna Salada and is currently found on the adjacent Mori Point property. Because all four species are currently found on or near the study area, there is every expectation that the enhancement plan should (a) improve habitat conditions for these species, (b) increase use of Sharp Park and the surrounding area, and (c) increase their local population sizes to decrease the danger of extinction.

Sharp Park is publicly held and not threatened by further development that would otherwise threaten the special status species. Nevertheless, the use of Sharp Park as a golf course and for public access to the coast has potential impacts for wildlife. However, public access impacts may be avoided with barriers in critical habitat and through public education. The USFWS Recovery Plan (1985) for the SFGS mentions the need to control heavy foot

travel around waterways. Foot traffic continues to be heavy around the edge of the marsh areas, primarily by individuals collecting golf balls.

Any future expansion of traffic on the road between Sharp Park and Mori Point needs to be mitigated to prevent road killed SFGSs. Apparently, a ban of off-road vehicle use has not been effective (Michael Rothenberg, President, Pacificans for Mori Point, pers. comm.). Mori Point presently receives a large amount of recreational use. Hikers, bikers, off-road vehicles (including 4-wheel drive trucks, 3-wheel ATCs and motor bikes), parasailers, bird-watchers, and people walking their dogs were all observed in the area. The most detrimental activities to wildlife presumably comes from off-road vehicles which have scarred the landscape, eliminated vegetation and caused erosion. The area is also used as a dump with piles of mattresses, old cars, and trash.

Critical habitat is either privately owned or is immediately adjacent to private land in the Mori Point area. Hence, many of the enhancement suggestions at Horse Stable Pond, the marsh to the east, and the upland area to the south will be greatly affected by the extent and type of development. This is particularly true for the SFGS as it was only found on Mori Point and Mori Point is considered an important dispersal corridor for the snake.

Natural disasters, such as the storm surge that caused high salinities in the freshwater habitats at Sharp Park, should be anticipated to occur infrequently even with the recent additions to the sea wall. Such disasters may eliminate critical habitat for the special status species and alternative habitats should be provided. Water salinity was quite low during this study indicating Laguna Salada and Horse Stable Pond have returned to freshwater. McGinnis (1984) indicated salt-water intrusion had occurred two years previous to his 1984 survey based on interviews with golf course personnel, and he measured salinities in 1986 (McGinnis 1986b) which he believed too high to support RLF.

Finally, low water quality due to run-off from the golf course and other nearby housing developments may pose a threat to aquatic animals. Chemical treatments of the golf course, mentioned as a possible threat by USFWS (1985), may impact FTDFs and RLFs and other amphibians.

V. ENHANCEMENT PLAN OBJECTIVES

In determining the need for an enhancement plan for Laguna Salada, the City of San Francisco and the State Coastal Conservancy identified four broad goals:

- Preserve and enhance the site for endangered species, particularly the San Francisco garter snake.
- Protect and improve wildlife habitat.
- Provide for long-term, beneficial management and maintenance of the wetland.
- Coordinate with the City of San Francisco on any adjacent construction projects, particularly the sea wall.

During the collection of data on existing conditions and based on input from the interagency advisory group, these general policies have been refined as a series of specific goals. Although all of the goals are important, those relating to endangered species are critical. For several species, the site represents one of the most crucial areas of remaining habitat. The enhancement plan elements in Chapter VI are designed to respond to each of the following goals.

A. CRITICAL SPECIES GOALS

1. Determine the occurrence of target endangered species using the site at present.
2. Identify specific areas and habitat types being used by endangered species on the site.
3. Protect and manage existing habitats for endangered species.
4. Expand endangered species habitat by modification of adjacent areas to conditions favorable to the species.
5. Provide new information as feasible on the occurrence, behavior and overall natural history of the target endangered species.
6. Provide information on the role of adjacent off-site areas in the regional protection and enhancement of endangered species habitat.

B. MULTIPLE SPECIES HABITAT

1. Enhance existing degraded wetlands to improve overall wildlife habitat on the site.
2. Identify potential wetland expansion areas.
3. Improve riparian habitat along Sanchez Creek.
4. Improve upland habitat.

C. HYDROLOGY

1. Develop a water management plan to protect and enhance endangered species and maximize resource values without compromising adjacent flood control needs.
2. Identify current flood hazards (with completion of the sea wall). Recommend flood control strategies that are compatible with resource needs.
3. Discuss the feasibility of using tertiary-treated waste water (when and if it becomes available) to supplement natural freshwater inflow.

D. PUBLIC ACCESS

1. Manage public access to promote views of the site and use which is compatible with the natural resource values of the site and with the golf course operation.
2. Identify appropriate buffer zones to reduce human and domestic/feral animal intrusion into sensitive wildlife zones.
3. Discuss the impact of poaching on the SFGS.
4. Discuss possible educational opportunities.

E. COMPATIBLE LAND USES

1. Provide recommendations to the Golf Course Management regarding reconstruction of the former hole between Laguna Salada and the levee.

2. Provide information on the role of adjacent off-site areas to the ecology of critical species.
3. Discuss the role of off-site development on flood hazards.
4. Evaluate the role of the sea wall to the overall Laguna Salada Enhancement Plan.

VI. ENHANCEMENT PLAN ELEMENTS

A. PLAN OVERVIEW

The recommended plan focuses on the management and enhancement of the special status wildlife species found on or adjacent to Sharp Park. However, the recommendations will improve conditions for a variety of additional species. The plan recognizes that existing conditions are suitable for all four of the special status species and a dramatic major reconfiguration of habitat is not recommended. Instead, an overall water management program and specific, localized enhancement measures are recommended. The critically low number of individuals of some species suggests a cautious approach to developing or modifying adjacent off-site areas.

The format of the enhancement plan is as follows. In the first section, we make recommendations for the overall water management of the entire wetland system. Following this, the habitat needs of the four special status species, and specific enhancement features at each of the major components of the Laguna Salada system that meet their needs are listed.

B. WATER MANAGEMENT PLAN

It is clear that management of water levels and quality in Laguna Salada is crucial to both the overall habitat quality and to the enhancement of critical species on the site. In addition, it is a key element in the management of the golf course, particularly during floods. Water management may be separated into four broad categories:

- Water level management
- Management during floods
- Water quality management
- Supplemental water supply

These are discussed in the following sections.

1. Water Level Management

During the course of the year, the water level in the system fluctuates in response to water inputs (winter rainstorms, groundwater inflows, irrigation on the golf course, and periodic flows down Sanchez Creek) and outflow (pumped outflow, flow out the gravity

culvert, evaporation, and seepage). Many of these factors are uncontrolled, and the water surface elevations rise and fall in response to the natural variations. During the study period, water levels varied between about 3 ft. and 5 ft. NGVD, reflecting non-flood conditions. The optimum range for water surface elevations from a natural resource perspective is between 4 and 5 ft. NGVD. Above these, flooding of the golf course begins, while below 3.5 ft. NGVD, shallow water depths permit emergent vegetation (tules and *Schypus*) to invade. Considering the flood hazards, it would be preferable to maintain water levels between 4.0 and 4.5 ft. Somewhat lower winter water levels (about 3.5 ft. NGVD) would be acceptable if the summer levels could be kept above 4.0 ft. Our primary concern has been that summertime elevations below 4.0 ft. are allowing encroachment and loss of open water by emergent vegetation. The main elements which allow some control over water levels are:

- The capacity of the pumps
- On-and-off level settings for pump controls
- Flow out the gravity culvert

a. Pump Sizes

The pumps are clearly undersized to prevent flooding of the golf course. In addition, they are old and in relatively poor condition, and should eventually be replaced. Our modeling results suggest that pumps with a capacity of 30 to 100 cfs will be required to reduce major flood hazards. However, their performance is more related to flood protection than resource enhancement. In addition, the cost of a new or substantially upgraded pump station would be high (\$0.5 to \$1.0 million) and is probably not warranted solely for flood reduction purposes. It should be noted that all rainfall runoff in the watershed eventually ends up in Laguna Salada and must be pumped out. Thus, any new development or roads in the watershed will increase flood hazards and pumping requirements. As such, a drainage fee should be levied on development which can eventually be used to improve the pump system.

b. Pump Level Controls

Our surveys indicate that the pump level controls are currently switched on at 4.3 ft. and off at 3.2 ft. NGVD. The latter elevation is too low, if subsequent winter inflow does not raise the water level back to about 4.0 ft. We would prefer to have the pumps shut off at either 4.0 ft. or 3.75 ft. Typically, the level sensors are set with about a 1-ft. difference between on and off settings to prevent frequent "cycling" (on-and-off switching, which wears the pumps out more quickly). It is not clear if this would be a problem for these relatively small pumps. Some experimentation would be in order. If cycling is a problem, the on-and-off settings could be adjusted to 4.5 ft. and 3.5 ft. respectively. Cycling will be less of a

problem when the connector channel is deepened, as both Laguna Salada and the Horse Stable Pond will function as a single pond in these elevation ranges.

Considering both the flood control needs of the golf course and the water depth needs of the wetlands, the preferred solution would be to operate the pumps differently during the rainy season and the dry season. During the winter (October through March or April) the pumps could be operated as they currently are (on at 4.3, off at 3.2). However, as discussed under the section on red-legged frogs, rapid pumping after high-rain periods may drop water levels precipitously, thereby exposing RLF egg masses to desiccation and washing larvae out of the pond into the ocean. During summer, the water levels would be maintained at 4.0 to 4.5 feet, and the pump level controls either reset to a higher level, or turned off. This may require addition of some water following the rainy season (when levels could be as low as 3 feet) and throughout the dry season to maintain water level. TTWW would be a likely candidate to supplement the natural surface of groundwater inflow.

c. Gravity Flow Culvert

The 2-ft. diameter outflow culvert from the Horse Stable Pond to the Pacific Ocean is also in poor condition. The inlet side in the Horse Stable Pond (pipe invert elevation = 3.3 ft. NGVD) has about a foot of sand in it. The outlet end on the beach is buried under about five feet of sand. To be useful during a flood, the discharge end is located by water seepage and excavated with a backhoe.

Similar to the pump station, the primary role of the culvert is for flood control; at present, it does not have a major role in the natural resource functioning of the ponds. However, despite being partially blocked, it may be allowing summertime seepage and contributing to the undesirable low water levels.

Major upgrading of the gravity outflow system for flood-control purposes would be expensive. Our hydraulic modeling shows that the existing 2-ft. diameter pipe should be replaced by one or two 4-ft. diameter pipes to effectively remove large amounts of water in a major rainstorm. To prevent blockage by wave-transported sand on the discharge side, the pipes would have to extend beyond the beach into subtidal water. This would probably require that they be attached to the current pier structure that supports the pump discharge pipe. The discharge ends of the pipes would be equipped with flap gates to prevent seawater backflow into the pipes. The cost to install 300 ft. of twin 48-inch pipes with headwalls and flap gates in this difficult working environment would probably be between \$250,000 and \$350,000. Their long-term functioning in the harsh marine environment is uncertain. For these reasons, this is not likely to be feasible at this time.

For natural resource enhancement, control of water surface elevation and seepage prevention out of the gravity culvert are desirable. To accomplish this and improve the existing inlet conditions, the inlet area should be dredged and the culvert cleaned. (This may be accomplished by excavating the discharge end of the culvert and flushing the culvert with

a high-pressure water jet.) The inlet end of the pipe should be fitted with a flashboard weir. To control water levels, the flashboard should be set at 4 ft. The flashboard weir will reduce blockage of the east end of the culvert from sediments in the pond. (Sand blockage from the beach will continue to affect the pipe.) A staff gage should be installed on the pump house to allow direct reading of the water elevations.

2. Management During Floods

As discussed in the Existing Conditions section, Laguna Salada and the golf course are subject to flooding from two sources: freshwater flooding during periods of extreme rainstorms and seawater flooding during periods of wave overwash. From a natural-resources perspective, the main adverse effect of rainfall flooding results from inundation of habitat. This can be partially mitigated by providing higher ground refuge, with adequate vegetation cover to prevent mortality from predators. This is discussed further in subsequent sections. Aside from this, the water level should be returned to the recommended 4-ft. operating elevation as soon as possible. Periodic flooding of wetland habitats is a natural phenomenon and (except for economic damages to developed areas) not adverse to the ecological system. As discussed in the previous section, measures to control flood levels (larger pumps and discharge culvert) would be expensive.

Seawater flooding has had much more serious consequences for wildlife, particularly the RLF and SFGS. Prevention of high salinity levels is justified for the preservation of these species. The newly-constructed seawall will dramatically reduce seawater flooding. The two main factors in its success will be frequency of overtopping and long-term stability. Constructed with a top elevation of 25 ft. NGVD, the levee will only be overtopped infrequently. Water volumes during overtopping will likely be low, assuming the levee remains intact.

If overtopping does occur, the City should monitor salinity levels in the lagoon. Pond salinity has dropped from 7 to 10 ppt during the 1983 and 1986 overwash periods to present levels below 1 ppt. If levels exceed 3 to 5 ppt, the lagoons should be pumped down and refilled with fresh water. If freshwater inflow is likely to be available from subsequent rainstorms, irrigation of the golf course, or tertiary-treated wastewater, the ponds should be pumped down to an elevation of about +1.0 ft. and refilled with fresh water. This would remove about 75 percent of the total water in the ponds; if the initial salinity were 5 ppt, it would be reduced to about 1.25 ppt. It would require pumping of about 22 acre-feet of water, which would take about 30 hours of pumping (assuming the pumps are operating at 9 cfs). The pond would likely require a month or longer to refill from groundwater seepage and natural runoff. A more rapid refilling (and concurrent reduction in salinity) would be preferred if a fresh water source is available.

The long-term stability of the seawall is obviously crucial to the prevention of salinity intrusion and sand transport to the ponds. At present, a portion of the compacted earth levee is protected with rip-rap. The City is monitoring erosion to determine the need for

additional protection (Sean Sweeney, pers. comm.). We are assuming that the seawall will be maintained in perpetuity by the City. If this were not done, more frequent overwash would occur. The above pumping regime would be likely required on an annual basis; conditions for endangered species would deteriorate.

3. Water Quality Management

Salinity management is the most critical water quality management issue affecting endangered species use of the site. The construction of the seawall wall and the pumping regime/freshwater replacement approach suggested above should provide adequate fresh water for the RLF and SFGS.

Other issues include the quality of inflow water to the ponds. Direct runoff from the golf course will transport fertilizers or any herbicides/pesticides used in turf management. Runoff from adjacent developed areas may transport traces of heavy metals and other urban pollutants. These are not quantifiable without a specific monitoring program. The one-time spot samples collected did not indicate unusually high pollutant levels. The absence of wildlife mortality also indicates that toxic pollutant levels have not occurred. Long-time pollutant effects are unknown.

The proposed changes in hydrology will reduce mosquito problems by providing deeper water and improved circulation through the system.

4. Supplemental Water Supply

The City of Pacifica has indicated that its treatment plant may be capable of providing significant amounts of tertiary-treated wastewater (TTWW) in the future. If this were done, this water may be available for use in wetland enhancement as well as golf-course irrigation. The treatment plant is located about 2,000 ft. north of the golf course. For relatively small amounts of water delivery, a relatively small (3- or 4-inch line) pressure line could be constructed directly from the plant to the golf course. As the tertiary-treatment capacity expands. The effluent would likely be pumped to a holding reservoir in the watershed and then distributed via a major gravity line (about 30 inches in diameter) to users.

There appears to be a number of alternative scenarios:

- a. No use of the TTWW on either the golf course or the wetlands.
- b. Use of the TTWW for golf-course irrigation. Eventual seepage and groundwater flow to the ponds.

- c. Direct discharge of TTWW to the ponds in emergency situations (either to fill the ponds following pumping drawdown to remove saltwater, or as a supplement to maintain water levels during a drought).
- d. As a continuous inflow source to the lagoons to provide regular circulation during summer months or throughout the year.
- e. As a water source to create new wetlands in adjacent areas.

The main question (on a nationwide basis) regarding the use of TTWW is that of water quality. If the treatment process provides water with acceptable pollutant levels, the water represents an attractive source. As such, the wetland use would probably be competing with other water users. In any event, final determination of the potential use must be based on water quality issues.

For Laguna Salada, it appears that existing water sources are capable of creating and maintaining a high-quality wetland capable of supporting all four endangered species. Water levels or circulation do not appear to limit these species. As such, Alternative d (continuous inflow of TTWW) is not recommended at this time. Alternatives b, c, and e do appear to have merit. Use of TTWW on the golf course (Alternative b) is particularly attractive. If the ponds experience a significant wave overwash event, the resulting high salinity in the ponds will eliminate RLF and greatly reduce habitat value for the SFGS. Pumping out the salt water and replacing it with low-salinity TTWW represents the only realistic approach to minimizing salinity damage.

Perhaps the most attractive use of TTWW would be the possible creation of new wetlands in existing upland areas (Alternative e). Here, the extensive use of TTWW would not affect existing wetlands or endangered species. Unfortunately, there is almost no land on the site and very little available land on adjacent areas where wetland creation is feasible. Virtually all of the site is developed as a golf course or is already an integral part of the wetlands. Some areas just south and east of Horse Stable Pond could be converted to wetlands, but this can likely be done by excavation alone, using existing water surfaces. Surrounding open-space areas to the south are hilly. While wetlands could be created by grading a series of ponds and wetland plateaus, this would be of questionable value; in addition, the SFGS already uses this area.

In summary, it appears that TTWW can represent a valuable supplement to existing water sources under certain conditions. However, there does not appear to be a major need or opportunity to use it in significant quantities on a regular basis at this time. In response to the Draft Enhancement Plan, the City of Pacifica provided additional information on the possible use of TTWW. This letter (included as Appendix D) stresses the volume of the water for circulation, and describes additional water quality and risk factors. It also points out the use of TTWW may provide a funding source for the Enhancement Plan.

The use of TTWW would require construction of a connecting line either directly from the treatment plant (approximately 1,500 feet south of Laguna Salada). The size of pipe would likely be determined by the volume required for irrigation of the golf course. A 3-in. to 4-in. diameter pressure pipe installed along Palmetto Avenue would be the most direct route to the golf course. If this route were unfeasible, the water line could be placed along the seawall.

C. SPECIAL STATUS SPECIES HABITAT REQUIREMENTS

The proposed enhancement plan recommends habitat modification, public education and awareness programs, and wildlife protection to improve habitat conditions for the four special status species at Sharp Point: San Francisco garter snake (SFGS), red-legged frog (RLF), San Francisco forktail damselfly (FTDF), and salt marsh yellowthroat (SMYT). The plan will also improve habitat conditions for other wildlife, such as song birds and amphibians.

Table 3 lists the critical habitat requirements of the four special status species and Table 4 identifies briefly how the enhancement plan fulfills these requirements. The major enhancement plan elements are shown in Figure 40 and in the 100-scale plan enclosed in the map pocket. Details of the enhancement plan elements and location of the site are provided in the following sections.

D. ENHANCEMENT OPTIONS

1. Laguna Salada

Laguna Salada itself does not currently support any of the special status species. However, the habitat modifications listed below would significantly improve habitat values and the four special status species would be expected to use the lagoon and its perimeter in the future. These modifications are:

- Deepen the edge of Laguna Salada to provide breeding habitat for RLFs. Optimum depth for breeding RLFs is approximately 2 feet. Two foot depths should be alternated with depths of >3 feet to prevent closure of open water by cattails. This habitat structure would provide suitable habitat for the RLF, SFGS and FTDF (Areas "B", Figure 41). Along the shore this may be accomplished by alternating fingers of deep and shallow areas (Figure 42).
- Channels >3 feet deep should also be cut across the base of peninsulas extending into the lagoon to create small islands (Figure XX). Such islands would provide refugia for SFGS by preventing human and domestic and

Table 3:

Habitat requirements of the San Francisco garter snake, red-legged frog, San Francisco forktail damselfly, and salt marsh yellowthroat.

Species	Habitat Requirements
SFGS	Abundant prey including tree- and red-legged frogs, basking sites, protected dispersal corridors, upland overwintering sites, protection from predators and road and mower mortality.
RLF	Two-foot deep water for breeding, reliable year-round water sources, diverse vegetational structure adjacent to water including emergent vegetation and willows, elimination of predatory fish (if present).
FTDF	Sunlight areas with low vegetation in water habitats for breeding, tall grass-forb vegetation for roosting and foraging, protected shallow sunlight wetlands.
SMYT	Dense willows with a thick undergrowth of herbaceous plants, nest sites over or near open water, moist conditions in marshes that promote high insect abundance.

Table 4.

Habitat enhancement recommendations to meet the requirements of the special status species at Sharp Park.

San Francisco garter snake

- 1) Create shallow pools (< two feet) for treefrog breeding and deeper pools (two feet) for red-legged frog breeding sites.
- 2) Alternate fingers of various depths along the shoreline of the pond and lagoon to provide frog breeding sites.
- 3) Create canals across small peninsulas in the lagoon to make small islands for snake refugia and canals for frog breeding sites.
- 4) Create mounds adjacent to water for basking sites.
- 5) Leave a strip of unmowed grassland as a buffer surrounding water courses and ponds as foraging and dispersal habitat.
- 6) Open Sanchez Creek across southern fairway. Prune cypresses to allow light penetration to the creek area that is heavily shaded. Plant low growing emergent vegetation to increase foraging habitat.
- 7) If possible, secure adjacent Mori Point uplands and "bowl" area to protect dispersal corridors and overwintering sites.

Red-legged frog

- 1) Create pools, canals and deepen shoreline on pond and lagoon to two foot depths for breeding habitat.
- 2) Use tertiary-treated water to ensure year-round water supply.
- 3) Build mounds adjacent to the pond and lagoon and plant willows to provide vegetational structure.
- 4) Open Sanchez Creek, as in (6) above, to provide breeding habitat.

San Francisco forktail damselfly

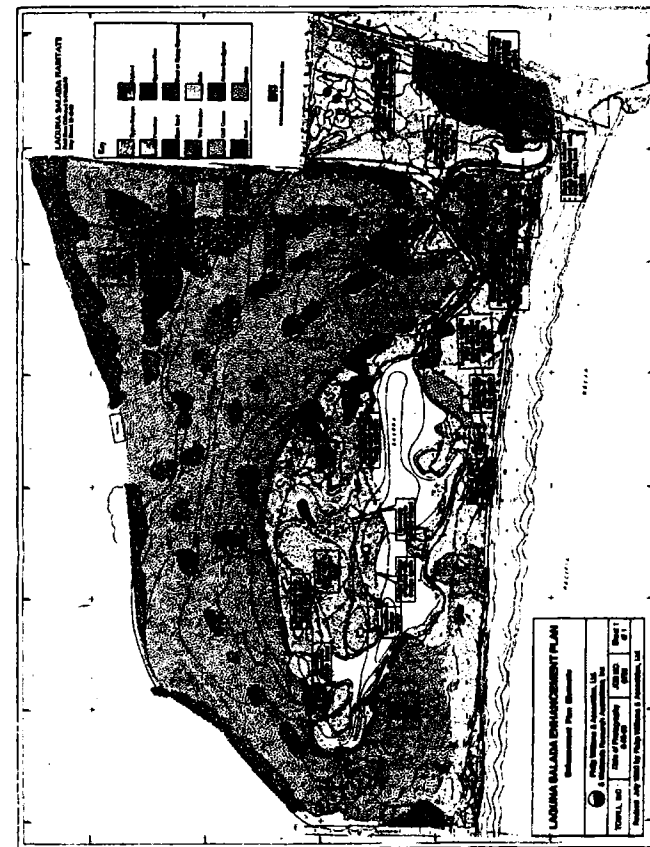
- 1) Control cattails and other emergent vegetation in connecting canal, Horse Stable Pond, and the lagoon by increasing water depth in sections to >3 feet and by dredging to provide open, sunlight areas for breeding.
- 2) Leave an unmowed buffer of grasses and forbs around connecting canal, Horse Stable Pond and the Lagoon for roosting and feeding sites.
- 3) Create shallow, sunlight wetland pools for additional breeding sites.
- 4) Open Sanchez Creek, as in (6) above, to provide breeding habitat.

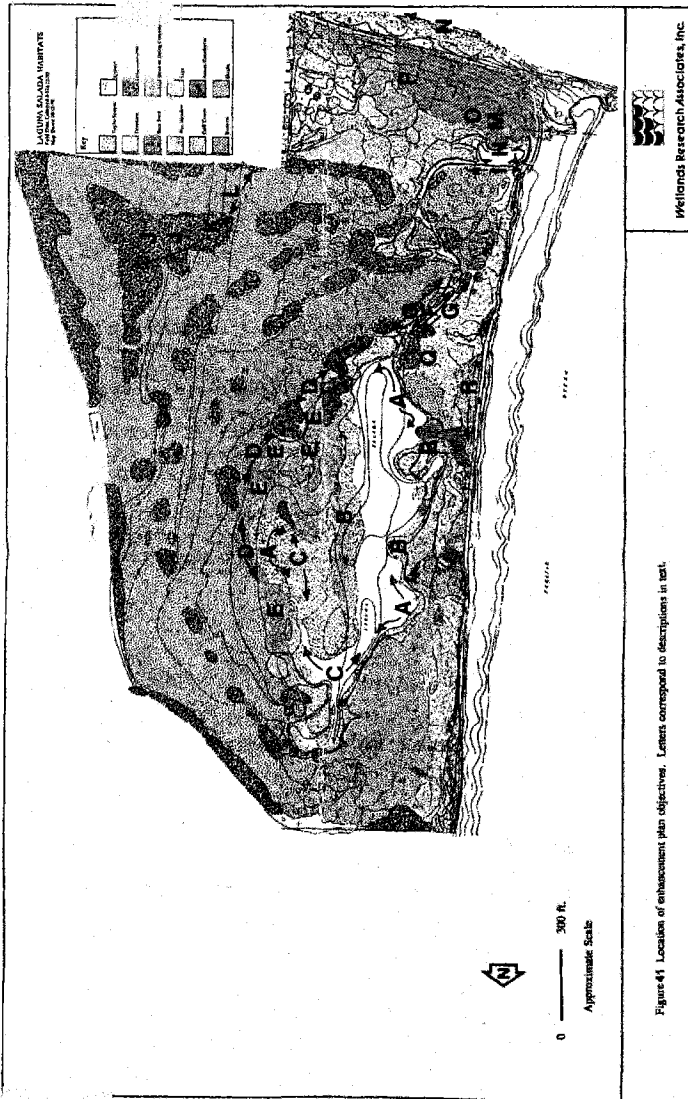
Salt marsh yellowthroat

- 1) Plant willows on mounds at edge of pond and lagoon for additional breeding habitat.
- 2) Use tertiary treated water to ensure year-round water supply and moist meadow conditions.

All Species

- 1) At a minimum, the critical habitat should be fenced and signs posted: "Sensitive Wildlife Habitat. Please Do Not Enter." A more formal wildlife reserve designation could be developed in consultation with CDFG and USFWS.
- 2) Post signs to limit foot traffic into and through critical habitats. Although this would not eliminate access, such as golfers retrieving balls from the rough within the fence, overall human intrusion would decline.
- 3) Build low wooden fencing to shield critical habitat from human intrusion.
- 4) Institute an educational program and provide interpretive material to golfers and other public users to increase awareness of the site's unique wildlife.





feral animal intrusion. The channels would also provide breeding habitat for RLF and FTDF (Areas "B", Figure 41). In addition, the central "peninsula" (see Figure 40) when cut-off should be expanded. As suggested by McGinnis (1986a), the island should have some elevated mounds approximately 6 inches high which are built around piles of concrete on slabs to provide retreat areas for SFGS.

- Large areas of the lagoon are choked with dense stands of tules or cattails that create poor habitat conditions for the RLF, SFGS and FTDF. Portions should be cleared and dredged to depths greater than 3 feet to provide open water areas for these species and for waterfowl (Areas "C", Figure 41).
 - A series of low berms or mounds should be created on the eastern margin of Laguna Salada and planted with willows (Figure 42). This would provide a barrier to shield portions of the marsh vegetation from foot-traffic, create basking areas for SFGS and RLF, provide vegetative structure for RLF, and create suitable nesting habitat for SMYT (Areas "D", Figure 41). Low areas between the berms would prevent water ponding problems behind the berms.
 - Create several small pools in the wet meadow east of Laguna Salada to provide breeding sites for RLF and Pacific tree frogs (Figure 42) (Areas "E", Figure 43).
 - Remove exotic vegetation including pampas grass, broom (*Cytisus* spp.), fennel and iceplant from some sites surrounding Laguna Salada and replant dead eucalyptus and acacia with willows.
 - The area could be designated with signs providing a statement such as "Critical Wildlife Habitat. Please Do Not Enter". A more formal designation and protection could be developed in consultation with the CDFG & USFWS.
2. **Connecting Canal**
- Redesign the canal profile to include a shelf of relatively shallow water (two feet) and a deeper channel (> 3 feet). This will ensure open water and abundant emergent vegetation (Area "F", Figure 41).
 - Create a 10 foot wide unmowed buffer along the canal to provide roosting and feeding habitat for FTDF and feeding habitat for SFGS. This will also provide a secure dispersal corridor between Horse Stable Pond and Laguna Salada for SFGS (Area "G", Figure 41).

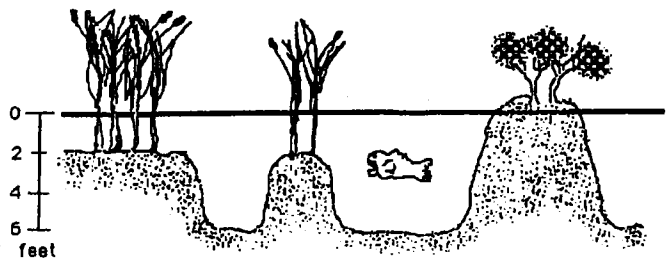


Figure 42 Profile of lagoon and pond edge showing areas excavated to provide a mosaic of open, deep water and shallow habitats.



Wetlands Research Associates, Inc.

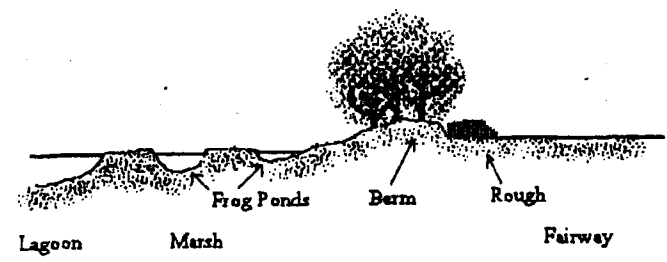


Figure 43 Area east of lagoon showing excavated frog ponds, berm planted with willows, and 10 foot unmowed buffer adjacent to fairway.



Wetlands Research Associates, Inc.

- Limit foot traffic in the unmowed buffer with low wooden fencing and by posting appropriate signs.

3. Horse Stable Pond

- Deepen the edge of Horse Stable Pond as described above for the lagoon to provide breeding habitat for RLF and a bank for basking snakes and frogs. Optimum depth for breeding RLF is approximately 2 feet. Adjacent areas should be deepened to >3 feet to prevent closure of open water by cattails. Along the shore this may be accomplished by alternating deep and shallow areas. This habitat structure would provide suitable habitat for RLF, SFGS and FTDF (Area "H", Figure 41).
- Create buffer vegetation on the west and north side of the pond. Tall (3 foot) upland vegetation adjacent to water provides roosting and foraging habitat for FTDF and foraging areas for SFGS. Limit public access into the buffer with signs and fencing (Areas "I", Figure 41).

4. Sanchez Creek Wetlands East of Horse Stable Pond

- Create a hydrological system that retains water from winter storm runoff and thus increases the depth and length of the hydroperiod in marshes east of Laguna Salada and south of Horse Stable Pond. Increased water depth in spring would decrease cattail growth and provide small pools in the lower areas in the marsh for breeding FTDF and Pacific tree frogs. Extending the period of surface water in the marsh would also benefit SMYT and make the habitat more desirable for breeding. However, the impacts of increased water depth on willows should be determined before any significant change in hydroperiod is instituted.
- Tertiary treated wastewater could be used, given suitable water quality, to maintain year-round water flow through Sanchez Creek and wetlands adjacent to Horse Stable Pond.

5. Sanchez Creek, Upstream

- Sanchez Creek should be modified to incorporate several small ponds and increase vegetational structure to provide breeding habitat for RLF and Pacific tree frogs (Areas "J", Figure 41).
- The Monterey cypress should be trimmed back to increase light penetration to the understory. This should promote understory growth and provide cover for SFGS, RLF and FTDF (Area "K", Figure 41).

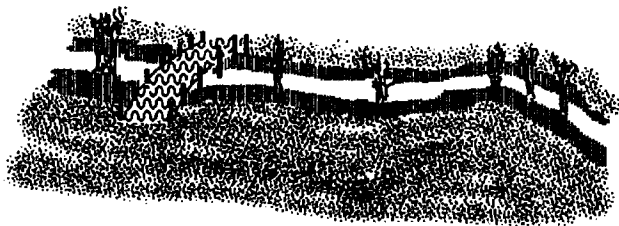
- Open Sanchez Creek on the southern most fairway and plant portions with emergent vegetation. An unmowed buffer should be left between the fairway and the creek. This would provide habitat for all four special status species (see Figure 44) (Area "L", Figure 41).

6. Uplands South of Horse Stable Pond

- The old tires, sheds, bathtubs and other debris should be removed (Area "M", Figure 41). This should be done under supervision of a trained biologist to avoid harming snakes that may occur in the area.
- If possible, the privately owned adjacent upland should be protected from development and maintained as SFGS habitat. This area is critical to SFGS because it allows the snakes to move freely between Sharp Park and upland overwintering sites (Area "N", Figure 41).
- The tall (3 foot) vegetation in this upland area provides foraging and perhaps nesting habitat for SMYT, roosting and foraging habitat for FTDF, and foraging and dispersal habitat for SFGS. However, the vegetation includes largely nonnative, invasive species which could be replaced with native grasses and forbs in a phased revegetation program (Area "O", Figure 41). Before such a program is implemented, surveys in the designated sites would need to be done to insure that no snakes are harmed in the process.
- There is a shallow depression downhill from the bowl on Mori Point and to the east of Horse Stable Pond. SFGS were abundant in this area in the '70's. A portion of the upland habitat south of the pond and adjacent to this depression could be excavated to provide shallow pools in the spring. This would create both frog and FTDF breeding sites and encourage use by SFGS. Such excavation should be done on a phased, small-scale, experimental basis to ensure the success of the modification (Area "P", Figure 41). Resurveys would be required to insure that no snakes would be harmed; any snakes present would be moved to an adjacent area on site.

7. Golf Course and Levee

- When rebuilding the lost fairway and green on the southwest corner of the Laguna, the green should be elevated, sloped slightly toward the tee, and set back from Laguna Salada to reduce intrusion into the shoreline vegetation on the lagoon perimeter. The green would be elevated to provide views of the lagoon and also provide a buffer area between the green and the lagoon edge vegetation. The area surrounding the fairway



Sanchez Creek Opened Across Fairway

Figure 44 Sanchez Creek opened across southern fairway.



Wetlands Research Associates, Inc.

and green should be planted with native dune vegetation (Area "Q", Figure 41).

- The levee currently supports little vegetation. It should be planted with perennial grasses on the upper slope. The lower sandy slopes should be planted with native coastal dune vegetation (Area "R", Figure 41).

8. Educational-Public Awareness

- Institute an endangered species environmental education curricula for Pacifica students.
- Post signs identifying critical areas as sensitive species habitat.
- Require golf course personnel to consult with wildlife agencies or trained biologists before altering sensitive species habitat with bulldozers or other heavy equipment.
- Institute an educational program and provide interpretive material to golfers and other recreational users of the park and adjacent Mori Point to increase awareness of the area's importance for a number of endangered species. Encourage people to actively protect their unique park.

E. PROPOSED DREDGING PLAN

To accomplish the enlargement plan elements described in the proceeding sections, a dredging and spoiling disposal/grading program will be required. The major components are shown in Figure 45 which shows proposed bathymetric (deep water only) contours and spoil placement locations. The total dredged quantities are listed in Table 5. A maximum of about 33,000 cubic yards (cy) of sediment would be excavated. More detailed estimates would be provided during the final design. In Laguna Salada the east arm of the main pond will be dredged to a bottom elevation of -1.0 feet. This will provide 4 to 5 feet of water depth during normal dry season conditions, which will prevent encroachment by emergent vegetation. Along the shoreline, alternating bands of deep and shallow water will be provided. Three peninsulas of land which extend into the pond will cut off as islands by excavating open water channels at their base. In addition, a number of shallow ponds will be excavated along the east side of the Laguna and on the main island. The majority of the excavated dredge spoils will be placed in a band 100-200 feet wide along the tee, fairway and green of the former golf hole (which is proposed for rebuilding). The spoils will require drying and conditioning, prior to final grading. The placement of dredge spoils will raise this area 5 to 7 feet. In addition to providing on-site disposed of spoils (greatly reducing construction cost), the raised golf hole will provide an overview of the wetlands of ponds

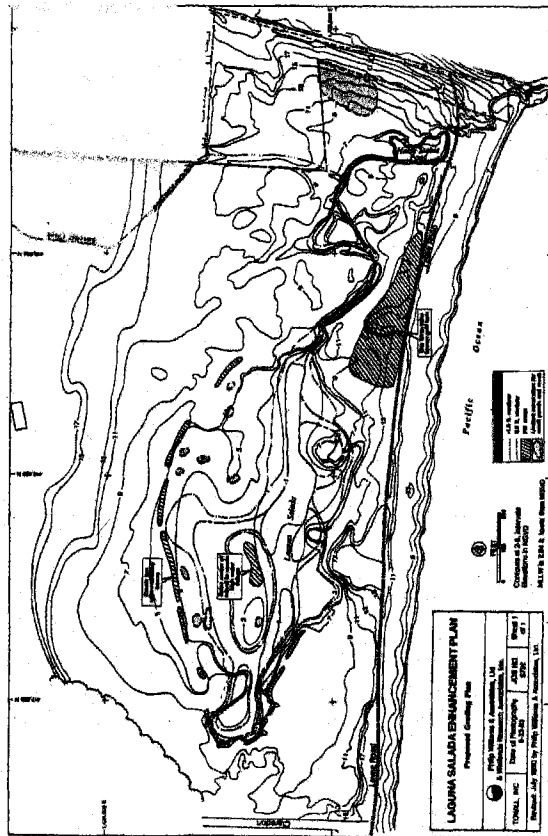


Figure 45

Table 5:

EXCAVATION VOLUME AND SPOIL PLACEMENT ESTIMATES

EXCAVATION SITES	VOLUME (cubic yards)
1. Laguna Salada	26,400
2. Horse Stable Pond	2000
3. Connecting Channel	3300
4. Sanchez Creek	550
5. Additional Small Ponds	1000
TOTAL EXCAVATED VOLUME	33,250
DISPOSAL ZONES	
1. Berms: Assume 1500 LF, average height of 3 feet:	2,100 cy
2. Former Golf Hole: Assume 600 ft. long, 200 ft. wide, 7.0 ft. high:	31,000 cy
TOTAL SPOIL PLACEMENT	33,250 cy

without requiring closer access. This will allow maintenance of a buffer zone ground the wetlands.

In addition, some spoils will be used to create a series of low berms 2-4 feet high around the wetlands. These will further identify the border between the golf course of the wetlands, restricting access and reducing intrusion.

Along the connecting channel, the channel bottom will be deepened to -1.0 feet NGVD. This will provide a continuous hydraulic connection along all the wetlands between LS and the HSP. In addition to the deep channel, the connecting channel cross-section will also include a shallow bench or terrace along the west bank to create additional habitat for the FTDF. Closer to the HSP, a small triangular shaped area of wetland will be enhanced with a perimeter, open water channel. All construction work in this area will have to be closely monitored to insure no damage to the existing FTDF habitat.

The Horse Stable Pond will also be deepened to provide open water, free of emergent vegetation. The shoreline will provide alternating deep of shallow water habitat. Dredging will extend up to the pump house of gravity outflow culvert to allow more efficient water management. Some additional ponds will be created in the uplands along the south project property lines. Additional, habitat for the SFGS, as suggested by McGinnis (1986), could be constructed with dredge spoils along the south-west property line.

We have also proposed opening Sanchez Creek across the golf hole which parallels Fairway Drive. This would provide additional freshwater marsh and open creek habitat which we believe could be integrated with the golf hole.

The type of dredging and staging areas will be determined during the final project design/implementation phase. Three methods of dredging are feasible:

1. Land-based dredging and disposal, using hydraulic excavators, and dump trucks. A variant of this is the "Sauerman Technique", which uses a land-based crane operating a bucket on a cable. This system is capable of excavation in a large open water zone using land-based equipment.
2. A floating, clamshell dredge, with spoils placed in a small barge and then transferred to a dump truck.
3. Suction dredging, with the liquified spoils pumped to the disposal area.

Land-based dredging (Method 1) would be the least expensive and simplest. It will be used for all accessible areas, including the connecting channel, small ponds, Sanchez Creek and much of Horse Stable Pond. It may also be feasible in parts of Laguna Salada

A variant of this technique, referred to as the Sauerman Technique, allows land-based equipment to conduct dredging beyond the reach of excavator arm. A long, circular cable is looped around a pulley attached to an immovable object (bulldozer, tree, etc.) on the opposite side of the pond and controlled by the crane. A bucket is attached to this cable. This system is less precise than normal hydraulic excavator-based dredging and more expensive. However, it does provide the opportunity to use land-based equipment in open water areas, which is cheaper and may be less destructive than floating equipment.

For areas inaccessible by land, methods 2 or 3 will be used. Method 2 (floating clamshell) is preferred since the dredge spoils are dryer and easier to handle and shape following excavation. However, transport from the excavation area in Laguna Salada to the shore may be difficult. Suction dredging (method 3) would simplify transport by using a temporary pipeline to pump the spoils to the disposal area. However, to allow pumping, the spoils are mixed with water to create a slurry, and a dewatering pond must be constructed. This method generally requires a location for discharge of the decanted overflow water from the dewatering pond.

Final selection of the dredging and disposal method will be made in conjunction with the dredging contractor. For preliminary cost estimates, land-based dredging (least expensive) has been assumed for all sites except for Laguna Salada. Costs for dredging the main pond assumes that one of the two more expensive methods will be used.

Management of the dredging program will be required to minimize disturbance to the shoreline habitat and golf course. Specific pond access locations and haul routes will be staked by the monitoring team. Sensitive wildlife areas will also be identified and fenced-off.

Timing of the construction will be determined by the project biologists to minimize wildlife impacts. While some disturbance to the site vegetation is inevitable, most of the wetland vegetation is robust and will recover fairly quickly. However, avoidance of construction impacts to the critical species is essential.

F. RECOMMENDATIONS ON REGIONAL PLANNING ISSUES

1. Mori Point Development

Privately held lands on Mori Point are both directly and indirectly important to SFGS, RLF, FTDF, and the SMYT. All of these species are found in areas adjacent to or on Mori Point lands and the SFGS is currently found only on Mori Point. In addition, Mori Point may serve as a critical SFGS dispersal corridor between Sharp Park and suitable habitat on Mori Point and Calera Creek. The marsh immediately east of Horse Stable Pond and the uplands to the south and southeast are an integral part of the Horse Stable Pond watershed. The proximity of these privately held lands to the Sharp Park project area makes their

development of great concern to the success of the proposed enhancement plan and future of the special status species.

2. Golf Course Planning

The proposed enhancement plan identifies several issues that bear directly on golf course planning. These issues are outlined here and discussed in more detail in Section V:

- When rebuilding the lost fairway and green for the hole southwest of the Laguna, the green and fairway should be elevated, sloped slightly toward the tee, and set back from the lagoon to reduce intrusion into the shoreline vegetation on the lagoon perimeter. The dead trees along the lake perimeter in this area should be replanted with native shrubs and shrub-like trees such as willow. The fairway and greens can be elevated, using dredge spoils to provide a view of the Laguna without requiring proximity.
- A series of small berms should be created on the east side of the lagoon and the connecting channel between the pond and the fairways and planted with willow. This would reduce intrusions into shoreline vegetation along the lagoon perimeter and provide basking sites for SFGS, diverse vegetational structures for RLF, and nesting habitat for SMYT.
- Grassland-forb vegetation adjacent to the lagoon, Horse Stable Pond, and the connecting channel should not be mowed. This would provide increased cover for SFGS and roosting and foraging areas for FTDF. The width of the unmowed buffer will vary depending on fairway configuration but at a minimum should be 10 feet on either side of the waterways.
- Sanchez Creek currently flows through the golf course. It is above ground when passing through the stands of Monterey Cypress but flows underground beneath the fairways. The Monterey Cypress trees that overhang the creek should be heavily trimmed to allow light to pass through and the creekbed planted with emergent vegetation. The creek should also be opened across the final fairway before it opens into the marsh and planted in places with low growing emergent wetland vegetation and in manner consistent with golf course use. This would provide habitat for SFGS prey items and FTDF. This will not increase mosquito populations at Sharp Park. Fencing and signage would deter golfers from retrieving golf balls from the creek and surrounding vegetation although this activity would not completely end.

EXHIBIT D

**2011-12 California Red-legged Frog
Sharp Park Egg Mass Survey
Summary 1/27/12-3/8/12**

Date Egg Mass First Observed	Egg Mass Number	Fate:
1/30/12	1	
1/27/12	2	
1/30/12	3	
1/27/12	4	
1/30/12	5	
1/27/12	6	
1/30/12	7	Notes say stranded
1/27/12	8	
1/30/12	9	
1/27/12	10	
1/30/12	11	
1/27/12	12	
1/30/12	13	
1/27/12	14	
1/30/12	15	
1/27/12	16	
1/30/12	17	
1/27/12	18	
1/30/12	19	
1/27/12	20	
1/30/12	21	
1/27/12	22	Discovered stranded on 2/8/12
1/30/12	23	Includes stranded egg masses Vredenburg lab observed
1/30/12	25	Includes stranded egg masses Vredenburg lab observed
1/31/12	26	
1/30/12	27	Includes stranded egg masses Vredenburg lab observed
1/31/12	28	
1/30/12	29	Includes stranded egg masses Vredenburg lab observed
1/31/12	30	fragmented
1/30/12	31	Includes stranded egg masses Vredenburg lab observed
1/31/12	32	
1/30/12	33	Includes stranded egg masses Vredenburg lab observed
1/31/12	34	fragmented
1/30/12	35	Includes stranded egg masses Vredenburg lab observed
1/31/12	36	
1/30/12	37	Includes stranded egg masses Vredenburg lab observed
1/31/12	38	

Date Egg Mass First Observed	Egg Mass Number	Fate:
1/30/12	39	Includes stranded egg masses Vredenburg lab observed
1/31/12	40	
1/30/12	41	Includes stranded egg masses Vredenburg lab observed
1/31/12	42	In saturated mud at waters edge with shallow margin
1/30/12	43	Includes stranded egg masses Vredenburg lab observed
1/31/12	44	In saturated mud at waters edge with shallow margin
2/14/12	45	
1/31/12	46	In saturated mud at waters edge with shallow margin
2/14/12	47	
1/31/12	48	In saturated mud at waters edge with shallow margin
2/14/12	49	
1/31/12	50	In saturated mud at waters edge with shallow margin
2/14/12	51	
1/31/12	52	In saturated mud at waters edge with shallow margin
2/14/12	53	
1/31/12	54	In saturated mud at waters edge with shallow margin
2/14/12	55	
1/31/12	56	In saturated mud at waters edge with shallow margin
2/14/12	57	
1/31/12	58	In saturated mud at waters edge with shallow margin
2/14/12	59	
1/31/12	60	In saturated mud at waters edge with shallow margin
1/31/12	62	In saturated mud at waters edge with shallow margin
2/14/12	63	
1/31/12	64	fragmented, scattered
2/14/12	65	eggs on bottom, broken
1/31/12	66	In saturated mud at waters edge with shallow margin
2/14/12	67	broken, on bottom
1/31/12	68	In saturated mud at waters edge with shallow margin
2/14/12	69	separated into parts
1/31/12	70	
2/14/12	71	
1/31/12	72	
2/14/12	73	
1/31/12	74	
2/14/12	75	
1/31/12	76	
2/14/12	77	
1/31/12	78	
2/14/12	79	

Date Egg Mass First Observed	Egg Mass Number	Fate:
1/31/12	80	In saturated mud at waters edge with shallow margin
2/14/12	81	Damaged, covered in algae on 3/7/12
1/31/12	82	In saturated mud at waters edge with shallow margin
2/14/12	83	
1/31/12	84	In saturated mud at waters edge with shallow margin
2/14/12	85	
1/31/12	86	13 egg masses, fragmented, at least six in mud
2/14/12	87	
2/14/12	89	
2/8/12	90	
2/14/12	91	
2/8/12	92	
2/14/12	93	
2/8/12	94	
2/14/12	95	broken apart
2/8/12	96	
2/14/12	97	embryos decaying, but not yet at hatching stage
2/8/12	98	stranded
2/14/12	99	
2/8/12	100	
2/14/12	101	
2/8/12	102	
2/27/12	103	
2/27/12	105	
2/8/12	106	
2/8/12	108	
2/8/12	110	
2/8/12	112	
2/8/12	114	
2/8/12	116	
2/8/12	118	fragmented, no dogs on golf side
2/8/12	120	fragmented, no dogs on golf side
2/8/12	122	fragmented, no dogs on golf side
2/22/12	150	
2/22/12	152	
2/22/12	154	
2/22/12	156	
2/22/12 & 3/1/2012	158	Two egg masses recorded as this number.
2/22/12 & 3/1/2012	160	Two egg masses recorded as this number.
2/22/12 & 3/1/2012	162	Two egg masses recorded as this number.

Date Egg Mass First Observed	Egg Mass Number	Fate:
2/22/12 & 3/1/2012	164	Two egg masses recorded as this number.
3/1/12	166	
3/1/12	168	
3/1/12	170	
3/1/12	172	
3/8/12	174	egg mass fragments noted at this location on this date.
3/8/12	176	
3/8/12	178	
3/7/12	201	
3/7/12	203	
3/7/12	205	
3/7/12	207	
3/7/12	209	
3/7/12	211	
3/7/12	213	
Total Egg Masses Observed:	148	
Total Egg Masses Stranded, Desiccated, Fragmented, or Otherwise Taken:	47	
% of Total Taken:	31.8%	

Notes:

- Summary chart prepared by the Wild Equity Institute.
- Summary is based on attached RPD data sheets. RPD has provided data only through March 7, 2012. RPD consultants may have evidence of additional egg masses and/or stranded egg masses.
- According to RPD, skipped egg mass numbers were not used during surveys. Typically numbers were skipped if observed could not recall the last number used from previous survey. To avoid double-counting, observer would skip-ahead a large number on the next data sheet.
- Egg masses with no fate information have an unknown fate. They are presumed "not taken" by RPD for the purposes of this summary.

Jon
Campo/RPD/SFGOV
01/21/2011 09:00 AM
To: David_Kelly@fws.gov
cc: Lisa.Wayne/RPD/SFGOV@SFGOV
Subject: Re: CRLF eggmasses Reference Number 81420-
2011-TA-093Notes Link

EXHIBIT E

Hi Dave,

I have some good news in regards to the CRLF's at Sharp Park golf course. The egg masses we have moved appear to be healthy as they approach gonner stage 15-21. Also, we seem to be having a banner year for breeding. I have been documenting the CRLF eggmasses at Sharp Park for over 8 years and this year I have recorded more than 3 times the eggmasses than any other year.

Unfortunately, the challenge is that they are also breeding at a very high rate in unsustainable habitat. Yesterday I found another 24 eggmasses in the shallow swale on the east edge of Laguna Salada. Again, without intervention they will become stranded and desiccate. I am assuming the USFWS is also supportive of moving these eggmasses. If have the your authorization, I can move the eggmasses tomorrow to a more sustainable habitat. Please feel free to call me to discuss this further.

Jon Campo
Natural Areas Program
SF Recreation & Park Department
811 Sanyan St.
San Francisco, CA 94117
Ph# 415.831.8332
Cell# 650.355.0247
Fax# 415.661.1979

-----David_Kelly@fws.gov wrote: -----

To: Jon.Campo@sfgov.org
From: David_Kelly@fws.gov
Date: 01/18/2011 08:35AM
Cc: Lisa.Wayne@sfgov.org, Chris_Nagano@fws.gov, Josh_Hull@fws.gov
Subject: Re: CRLF eggmasses Reference Number 81420-2011-TA-093

Jon Campo, thank you for the update.

David Lee Kelly
Biologist, Recovery Branch
US Fish and Wildlife Service
2800 Cottage Way, W-2805
Sacramento, CA 95825
Ph. (916) 414-6492

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

WILD EQUITY
INSTITUTE, a non-profit
corporation, et al.

Plaintiffs,

v.

CITY AND COUNTY OF
SAN FRANCISCO, et al.,

Defendants.

Case No.: 3:11-CV-00958 SI

DECLARATION OF VANCE VREDENBURG,
PH.D.

I, Dr. Vance Vredenburg, declare as follows:

1. I am submitting this declaration in support of plaintiff's motion for preliminary injunction. For the past decade I have worked as a post-doctoral researcher and professor studying the ecology of amphibians, with a particular emphasis on the causes of amphibian declines. I received my B.A. in Biological Sciences from the University of California Santa Barbara in 1992, and my Ph.D. in Integrative Biology from the University of California Berkeley in 2002. I am currently an Assistant Professor at San Francisco State University, and a Research Associate at the California Academy of Sciences and the Museum of Vertebrate Zoology at UC Berkeley. More detailed information about my background can be found in my curriculum vitae, which is attached as Exhibit A.

2. My research focuses on the causes of amphibian declines. For example, I conducted several whole-lake studies in the Sierra Nevada Mountains that conclusively demonstrated amphibian population declines when non-native fish were stocked in mountain lakes. This groundbreaking study was published in 2004 in the *Proceedings of the National Academy of Sciences*, arguably the world's most prestigious academic journal. I have since published over 30 peer-reviewed articles including five more articles in the *Proceedings of the National*

Academy of Sciences and several other prestigious scientific journals, and eight book chapters on amphibian ecology.

3. Currently I am collaborating with colleagues from UC Berkeley, UC Santa Barbara, and the University of Idaho on a National Science Foundation-funded study that seeks to understand how some populations of frogs survive disease epidemics. A newly-discovered fungal pathogen (the chytrid fungus, *Batrachochytrium dendrobatidis*) has caused hundreds of recent amphibian extinctions and represents the worse case of a single pathogen driving vertebrates to extinction in recorded history. Because this is so unusual in evolutionary history, my research on this issue has garnered substantial media attention, including feature articles on my field research in the Sierra Nevada in the *New York Times*, *National Geographic Magazine*, and documentary videos on Animal Planet (with Jeff Corwin), the National Science Foundation's *Science Nation* show and coverage of my studies on the California red-legged frog at Sharp Park on KQED's *Quest*, a weekly television show on the Bay Area's science and environment.

4. Living amphibians (Class Amphibia, Subclass Lissamphibia) include frogs (Order Anura), salamanders (Order Caudata), and caecilians (Order Gymnophiona). Of the three groups, frogs and toads exhibit the most varied reproductive modes and habitat associations and comprise the majority of recognized species (>6000 species). Salamanders and caecilians, also diverse, have fewer species and are more restricted but still have a widespread distribution (614 species and 188 species, respectively). Most of the world's amphibian diversity occurs in the tropics, especially in Central and South America, but other amphibian biodiversity hotspots include sub-Saharan Africa, Madagascar, Sri Lanka, Southeast Asia and Australia.

5. Amphibians are represented in diverse aquatic and terrestrial ecosystems and frequently are important components of communities and food webs. In some parts of the world they are the dominant predator, both in terms of numbers and total mass. They are diverse in behavior. Most salamanders have the structure of a generalized tetrapod with four legs, a relatively short

1 trunk, and a tail, but some are extremely elongated with very small limbs or only forelimbs, and
 2 some reach very large size — in excess of 1.5 meters. Caecilians, restricted mainly to the tropics,
 3 are limbless and their eyes are covered by skin. They have larger numbers of trunk vertebrae and
 4 are very elongated, but they either lack or have an exceedingly short tail. Frogs have a
 5 characteristic form consisting of a large head, a very short trunk, and four legs, the hind limbs
 6 containing four major segments, being elongated associated with jumping and /or swimming,
 7 and being suspended from elongated and specialized pelvic girdles. However, despite the
 8 constraints of body form frogs are diverse in morphology, coloration and behavior.

9
 10 6. Adult amphibians are effective predators and both salamanders and frogs have tongues
 11 specialized for rapid, long distance prey capture. Caecilians generally feed on subterranean prey
 12 such as earthworms. The amphibians are long-term survivors (existing on earth for more than 350
 13 million years) that endured four previous mass extinctions (e.g., 95 percent of all living species
 14 were lost in the Permian-Triassic extinction). Through these extinctions, all three orders of
 15 amphibians escaped extinction, and even most families and genera survived. This was not the case
 16 for most other groups of organisms (e.g. dinosaurs, etc). Yet today the amphibians, presently
 17 including more than 6,800 species, are the most threatened group of vertebrates on Earth with over
 18 40 percent of species in decline and over 30 percent threatened with extinction.

19
 20 The geographic extent of the declines is worldwide. The areas most affected are located in
 21 Central and South America, the Caribbean, the wet tropics of eastern Australia (Figure 2), and
 22 western North America (Stuart et al. 2004). Less is known about the status of species in Africa
 23 and Asia due to a lack of long term studies. The first reports of massive collapse of amphibian
 24 faunas came from montane areas in Central America and Australia. The loss of more than 50%
 25 of the species in a large tropical montane fauna (Monteverde Cloud Forest Reserve) in Costa
 26 Rica in the course of a single year (1987) was a profound shock, and included the first
 27 prominent extinction (the Golden Toad, *Bufo periglenes*). Collapse of amphibian fauna in
 28

1 montane and lower montane Central America and South America is on-going. Several species of
 2 frogs declined dramatically, some to apparent extinction, in eastern Queensland, Australia,
 3 starting at about the same time (1980's).

4
 5 7. Concern has been expressed over declines of frogs in California for many years, and in
 6 the 1980's and early 1990's the phenomenon accelerated. Now there have been reports of
 7 mainly geographically limited declines from many parts of the world. California, along with
 8 Central America and Australia, has been a focal area for the study of amphibian population
 9 declines, because of the severe declines of many of its species. The region is recognized as one
 10 of the world's biodiversity hotspots (the "California Floristic Province") and contains a
 11 heterogeneous landscape that sustains a wide variety of ecosystems, such as Sonoran deserts,
 12 marshes and wetlands, oak woodlands, high-elevation alpine systems, temperate rain forests, and
 13 many others. The amphibian fauna is diverse and includes 67 recognized native species,
 14 including 41 species of salamanders from five families and nine genera, and 26 species of frogs
 15 and toads from five families and six genera (plus two introduced species). Amphibians in
 16 California can be found in nearly all habitat types ranging from near Mount Whitney (at 3,657
 17 m, the highest peak in the contiguous United States) to Death Valley (85 m below sea level).
 18 Despite the fact that California contains some of the largest contiguous protected habitats in the
 19 continental United States, nearly one-quarter of amphibians in California are threatened.
 20 Many potential causes for the widespread declines of amphibians have been proposed. In
 21 general these can be grouped into two major categories: 1) factors general to the overall
 22 biodiversity crisis, including habitat destruction, alteration and fragmentation, introduced
 23 species and over-exploitation, and 2) factors associated with amphibians that might account for
 24 declines in relatively undisturbed habitats. The first category includes relatively well understood
 25 and reversible direct ecological phenomena, whereas the second includes complex and elusive
 26 mechanisms, such as climate change, increased ultraviolet (UV-B) radiation, chemical
 27
 28

1 contaminants, infectious diseases, and the causes of deformities (or malformations). Habitat
2 alteration and outright destruction are the single most important cause of declines in California
3 and worldwide. The underlying mechanisms behind all of the factors stated above are sometimes
4 complex and may be working synergistically with more evident factors, such as habitat
5 destruction and introduced species, to exacerbate declines.

6 In California, amphibian declines are associated with many of the various hypotheses. Habitat
7 destruction, alteration, and fragmentation have affected a large number of species including the
8 California red-legged frog (CRLF), the Foothill Yellow-legged Frog, the Arroyo Toad, and the
9 California Tiger Salamander, to name a few. Some amphibians began suffering declines long
10 ago. In the 19th century, the California Gold Rush brought waves of new settlers who quickly
11 over-exploited some frog species for food, including the CRLF. They also altered the
12 environment in ways that have had much more substantial effects on amphibians. Cities were
13 built, rivers dammed and diverted, forests were cleared, and the waterways of Great Central
14 Valley were completely altered for agriculture and to provide water for cities and industrial
15 growth. The effect on California's ecosystems has been profound. As elsewhere, habitat
16 conservation has become a central theme in efforts to preserve the region's biodiversity.

17 8. Throughout my career I have retained a particular interest in the California red-legged
18 frog, *Rana draytonii*. This frog ranges in size from 1.5 to 5 inches in length, making it the largest
19 native frog in the Western United States. Adult females are significantly larger than males, with
20 an average length of 138 mm versus 116 mm for adult males. The hind legs and lower abdomen
21 of adult frogs are often characterized by a reddish or salmon pink color, and the back is brown,
22 gray, olive, or reddish brown, marked with small black flecks and larger irregular dark blotches.
23 Dorsal spots often have light centers, and in some individuals form a network of black lines.
24 Dorsolateral folds, raised fleshy stripes that run parallel to the length of the frog, are prominent
25 in this species of frog. Tadpoles range in length from 14 to 80 mm, and are a dark brown or
26

1 olive, marked with darker spots. *R. draytonii* breeds when the rains begin in earnest, usually in
2 November and, an breeding may continue through April, depending on local conditions. Egg
3 masses consist of between 300 and 5,000 eggs. Egg masses are nearly always attached to
4 submerged vegetation that has some standing plant matter above water. Eggs hatch after 6 to 14
5 days depending on water temperature. Larvae typically metamorphose in 3.5 to 7 months,
6 usually between July and September, but some overwinter and transform after more than 12
7 months in the larval stage. Males may attain sexual maturity at 2 years, females at 3 years, and
8 adult frogs may live 8 to 10 years. Like tadpoles of many frog species, larvae are thought to be
9 algal grazers, and the adult diet consists mostly of invertebrates. Pacific Tree Frogs (*Pseudacris*
10 *regilla*) and California mice (*Peromyscus californicus*) are occasionally consumed by adult frogs
11 but the importance of them in the diet is unknown. Juvenile frogs may be active both nocturnally
12 and diurnally, whereas adult frogs are primarily active nocturnally. The primary predators on *R.*
13 *draytonii* include garter snakes (*Thamnophis* spp.), raccoons (*Procyon lotor*), and great blue
14 herons (*Ardea herodias*). Less frequently, red-legged frogs are eaten by American bitterns
15 (*Botaurus lentiginosus*), black-crowned night herons (*Nycticorax nycticorax*), and rarely by red-
16 shouldered hawks (*Buteo lineatus*). Introduced species such as the bullfrog (*Rana catesbeiana*)
17 and non-native fish also prey on the frog.

18 9. The California red-legged frog is often referred to as "Twain's frog" because the Mark
19 Twain included them in his colorful stories of California's Gold Rush days. The species faces
20 several threats, and there is a high probability that the species will one day go extinct if these
21 threats are not addressed. The species is already gone from 70% of its historic range, and has
22 suffered a 90% population decline. Destruction and adverse modification of terrestrial and
23 aquatic habitat is the primary reason for these declines, along with disease, pollutions in the form
24 of pesticides and fertilizers, exploitation of the species for food, and predation from nonnative,
25 invasive species.
26
27
28

1 10. I have often shared my interest in the California red-legged frog with my graduate
 2 students and research assistants. Recently one of my master's graduate students completed her
 3 degree in a study on the California red-legged frog, including the California red-legged frog
 4 populations at Sharp Park, to determine precisely what comprises the frog's diet. We analyzed
 5 stable isotopes of carbon and nitrogen to trace energy flow through food webs. The basis of this
 6 technique is simply that carbon's isotopic signatures in aquatic and terrestrial plants are
 7 consistently different from each other (aquatic plants contain consistently more heavy isotopes
 8 than terrestrial plants). Because the isotopic signature of carbon does not vary once it is in the
 9 food chain (as you move up the food chain from plants to higher consumers), you can use it to
 10 trace where energy in food webs was first captured by plants. You can trace energy flow through
 11 food chains by comparing isotopic signatures in an organisms' tissues. We used this technique
 12 with California red-legged frogs and showed that the carbon in frog tissues could be traced back
 13 to terrestrial, and not aquatic sources. This ground-breaking study discovered that over 99% of
 14 the frog's diet is composed of terrestrial insects—*indicating that the frog's upland and*
 15 *terrestrial habitats are much more important to the species' long-term survival than previously*
 16 *imagined.*

17
 18
 19 11. My PhD training at UC Berkeley in the Museum of Vertebrate Zoology has provided me
 20 a deep understanding of amphibian morphology, phylogenetics, evolution and taxonomy. In
 21 2007, I published a detailed peer-reviewed paper in the *Journal of Zoology* on California's
 22 mountain yellow-legged frogs showing that there are two distinct species, while previously only
 23 one was recognized. I used morphology, frog vocalizations and molecular data to distinguish the
 24 two species. This work built on previous molecular and phylogenetic work I conducted on the
 25 relationship between western North American frog lineages, including the California red-legged
 26 frog, and published in the journal *Molecular Phylogenetics and Evolution*. I have studied
 27 thousands of laboratory specimens including hundreds of the California red-legged frog at the
 28

1 permanent collections at the California Academy of Sciences, the Museum of Vertebrate
 2 Zoology, and other biological science collections. These specimens have given me insight on the
 3 basic ecology, evolution and conservation of the species. As many others before me, I have been
 4 especially struck by how the species' population has been impacted over time. For example,
 5 museum records and specimens, perhaps more than any other line of evidence, illustrate the loss
 6 of populations because many specimens were collected in areas where the frog no longer exists
 7 today.

8
 9 12. Because of my study of frogs in the field and in the laboratory, I am an expert in
 10 identifying frog species. I can identify all life phases of the California red-legged frog in
 11 particular.

12
 13 13. I am also familiar with Sharp Park and its aquatic features that provide habitat for
 14 California red-legged frogs. As mentioned above, I have mentored a graduate student who has
 15 conducted field research at this site; I have visited the site to test the frogs for disease; and I
 16 regularly take my undergraduate and graduate students there on field trips to gain experience
 17 observing and identifying amphibians in the wild. I have also reviewed several reports about
 18 Sharp Park prepared by biological contractors for the City and County of San Francisco, and
 19 publications prepared by the U.S. Fish and Wildlife Service.

20
 21 14. It is my professional opinion that Sharp Park is an extremely important area for the
 22 California red-legged frog. Sharp Park must have successful recovery actions implemented, or it
 23 will one day lose its CRLF population, and potentially jeopardize populations at nearby
 24 properties as well. Because Sharp Park is relatively free from American bullfrog (*Rana*
 25 *catesbeiana*, also called *Lithobates catesbeiana* in the scientific literature)—a non-native
 26 predator and competitor of the California red-legged frog—and relatively free from disease, it is
 27 one of the last best restoration opportunities to help recover the species along the Coast.
 28 Moreover, Sharp Park is adjacent to several protected lands with California red-legged frog

1 populations of their own, and therefore it serves as a central location for populations of the
2 species on adjacent PUC watershed lands and neighboring Mori Point National Park.

3 15. California red-legged frogs have been documented at Sharp Park for decades. Wade Fox,
4 one of the first biologists to survey the area, noted that California red-legged frogs were found in
5 the bellies of snake specimens he had collected from Sharp Park in the 1940s. The frog has
6 persisted on the land since: although survey's in the 1980s did not find any California red-legged
7 frogs on the property, surveys in the 1990's found significant evidence of the species, and
8 several recent publications and reports produced by the City and County of San Francisco have
9 confirmed the presence of the species on the property. I have personally observed the species at
10 Sharp Park on numerous occasions, Sharp Park and the adjoining Mori Point are excellent
11 teaching examples for the students in my courses at San Francisco State University, located not
12 more than a 10 minute drive away. I use the contrast between land management in Sharp Park vs.
13 Mori Point as an example how the effects of human development and ongoing activities on
14 threatened amphibians can be reversed. At Mori Point, the National Park Service has restored
15 several breeding ponds and the California red-legged frog population has responded very
16 positively whereas at Sharp Park, human activities have obvious negative effects on the
17 threatened frog. It is not hard to see the difference when you are standing right there at the border
18 between the two properties. It is remarkable that you can park your car on Fairway Drive, walk
19 15 paces and view California red-legged frogs in the creek below. In the rainy months of the year
20 the frogs lay hundreds of egg masses that are easily visible from shore. Even during the day
21 adults can be seen at these sites and this is not always the case for California red-legged frogs. In
22 many other areas where they still occur, you usually have to visit sites at night to see adult frogs.
23 I believe they are visible at Sharp Park and especially Mori Point because there are few
24 introduced bullfrogs and the habitat, especially the restored areas, is prime habitat for the species
25 that can support robust populations. This has been the case dating back to the 1940s. At Sharp
26
27
28

1 Park and Mori Point all stages of California red-legged frog are visible, eggs, tadpoles, juveniles
2 and adults. This is not only great for educational purposes, but also signals that the habitats can
3 support robust populations. If it can be fully restored, this habitat is some of the best I've seen for
4 the species. Unfortunately, it is well documented that Sharp Park Golf Course has been killing
5 California red-legged frogs through operations and management of a pump house for many
6 years. San Francisco's Conceptual Restoration Alternatives Report explains that the take of the
7 CRLF, documented as early as 1992, is ongoing at Sharp Park.

8 16. After 2008, the City released a Final Draft Endangered Species Compliance Plan for
9 Sharp Park. I have reviewed this plan, and I am also familiar with the City's effort to move egg
10 masses in the Park. Even with these efforts, it is my professional opinion that there is a high
11 degree of scientific certainty that take of California red-legged frog egg masses through
12 desiccation will continue to occur in Sharp Park. Moreover, based on records of golf course
13 management and operations I have reviewed, my own observations of Sharp Park, and my
14 professional expertise, I believe that the City is not, and cannot, actually implement the
15 Compliance Plan - which contemplates managing water levels to avoid desiccation of CRLF egg
16 masses - making it virtually certain that California red-legged frogs will be taken unless the
17 relief requested by plaintiffs here is granted.

18 17. The California red-legged frog requires aquatic habitats to breed successfully. If the
19 aquatic features are not of sufficient depth and duration, the eggs may not survive.

20 18. At Sharp Park, the opportunity for frogs to complete this cycle is being undermined by
21 the management of the golf course, whereby two pumps drain Sharp Park wetlands (upon which
22 the golf course was built) during flooding that occurs as a natural function of winter rains. This
23 unnatural draining of what would otherwise be a naturally functioning wetlands complex is
24 causing the take of many California red-legged frog egg masses.
25
26
27
28

1 19. The Compliance Plan does not prevent egg mass strandings. This past winter, for
 2 example, the golf course operated the pumps with the Compliance Plan in place. Yet beginning
 3 in January, 2011, Recreation and Park Department staff had to move over one hundred egg
 4 masses that they concluded would not survive in the location where they were laid. It is my
 5 professional opinion that these egg masses would not have been stranded if the pumps were not
 6 draining Sharp Park's wetlands.

7
 8 20. These frogs have evolved over millions of years towards a strategy of egg-laying that
 9 balances water depth, water temperature, predator avoidance, and pond desiccation. The most
 10 successful frogs maximize the contrasting pressures of pond desiccation and water temperature.
 11 For example female frogs that choose to lay their eggs in deeper water are minimizing risk to
 12 desiccation but also exposing eggs to cooler water temperatures, which translate into slower
 13 growth and development. Deeper, more permanent water also harbors a more diverse food web
 14 which is more likely to contain aquatic egg and tadpole predators. Females that lay eggs in the
 15 shallowest water on the margin of ponds are maximizing growth potential (warmer temperatures)
 16 and minimizing exposure to aquatic predators, but are also exposing egg masses to higher
 17 probability of desiccation. If the rains continue and the pond does not dry too quickly the
 18 strategy pays off and eggs in shallow water hatch faster, tadpoles grow faster and outcompete
 19 other eggs and tadpoles from other frogs laid in deeper water.

20
 21 21. Ponds fill and dry seasonally and although it can seem rather dramatic from wet to dry
 22 years, the change over the course of days is not rapid because water levels decrease mostly due
 23 to evaporation from heat and use by terrestrial and emergent plants during photosynthesis. The
 24 pumping of water to dry up fairways at Sharp Park, however, is well outside the natural rate of
 25 pond drying and the frogs are not adapted to this type of rapid change in pond depth. Therefore,
 26 because these frogs have evolved a breeding strategy over millions of years that is cued in on
 27 natural rates of desiccation, the pumping of the ponds by the golf course will inevitable lead to a
 28

1 much higher mortality rate for the eggs that the females lay at the margins of the pond, in the
 2 shallowest water. This elevated mortality is completely man made and can be reduced if
 3 pumping is not allowed. Although RPD has for years been moving egg masses it determines are
 4 at some risk, egg mass movement is not part of the Compliance Plan.

5 22. Moving egg masses does not ensure their survival. Frog egg masses are encased in a
 6 protective jelly coating. California red-legged frogs females attach the egg masses to emergent
 7 vegetation usually suspended near the surface of the water to balance impacts from solar
 8 radiation from above while avoiding predators from below. Movement of egg masses can
 9 damage the embryos in a number of ways. For example, jarring movements can damage eggs
 10 directly and even when the embryos are at later stages and are less sensitive to movement, egg
 11 survival can plummet if egg masses are moved. Amphibian eggs are sensitive to changes in gas
 12 exchange rates across the jelly boundary and the egg membrane. If eggs masses are taken out of
 13 the water for more than a few minutes and exposed to air, then oxygen and carbon dioxide
 14 exchange rates can decrease rapidly because the jelly does not function well as a gas exchange
 15 membrane when exposed to air. The jelly can quickly begin to dry along the outer edge, this
 16 edge, like a thicker skin, impedes natural gas exchange rates. Additionally, once egg masses are
 17 placed in a new location, it is very difficult, to suspend them in the water column off the bottom
 18 yet also near the surface. If eggs become dislodged they can float away and end up in less than
 19 perfect microhabitats, for example they can be washed ashore by wind or even small wave
 20 action. Therefore, it is my professional opinion that at least some eggs and even entire egg
 21 masses that are relocated by the City in 2011 did not survive the relocation effort.

22 23. I am also concerned by the artificially high concentration of egg masses placed in
 23 Horse Stable Pond. Horse Stable Pond is the aquatic feature closest to Sharp Park's pump house,
 24 and therefore it is the area most impacted by the suction of the pumps. When a very large
 25 portion of Sharp Park's California red-legged frogs are placed in Horse Stable Pond, nearly the
 26
 27
 28

1 entire population is at greater risk of entrainment, impingement, or desiccation. If the eggs did in
 2 fact survive, then the pond may be at risk of exceeding its ecological carrying capacity. Many
 3 species, and in particular amphibians, have been shown to display density dependent growth. The
 4 idea is a simple one: while each species or population has the potential to grow exponentially this
 5 does not happen because of interspecific and intraspecific factors. At some point a population's
 6 size is either limited by resources (food, space, breeding sites, etc) or other individuals
 7 (competitors, predators, parasites, etc.). If thousands of eggs are being artificially added to a
 8 pond that wouldn't naturally have that high a number, then this could have very negative effects
 9 on the population. It could make food acquisition more difficult, it could make the population a
 10 target to predators that may be attracted to the large number or prey items, or abiotic conditions
 11 in the environment (oxygen concentration in the water may be lowered, or excreted compounds
 12 could overwhelm natural decomposers leading to toxic levels of nitrogenous waste). Of course,
 13 not all egg masses can be moved. On February 21, 2011 a partially submerged egg mass was
 14 found on the edge of Horse Stable Pond. The water level of Horse Stable Pond, as measured by
 15 the gauge at the pump house, at 2.9 meters (relative scale), but massive amounts of water were
 16 being pumped through the system. On February 23, 2011, I visited this egg mass, and
 17 discovered that the water levels were at 2.6 meters (relative scale); and the egg mass was
 18 completely exposed to the air due to the ongoing pumping. I identified the egg mass as a
 19 California red-legged frog egg mass, and concluded that it was not likely to survive. A
 20 photograph of the egg mass I viewed on that date is attached as Exhibit B. On March 1, 2011 a
 21 follow-up visit to the egg mass found that it was completely desiccated and partially frozen.
 22 All of these egg mass strandings occurred despite the Compliance Plan, which cannot reduce egg
 23 mass strandings to zero or anything close to it. Because, even with the pumps on full throttle, it
 24 can take days for the water to draw down after significant rainfall, large numbers of California
 25 red-legged frog egg masses are often laid in areas that become exposed to the air due to the

1 pumping operations, even though the Compliance Plan is functioning as designed. Finally,
 2 because the Compliance Plan provides for so much pumping the water that remains to secure egg
 3 and tadpole development is reduced. If a large rain event is followed by an extended drought,
 4 the buffer of rainwater provided by the initial storm event will have been eliminated, and the frog
 5 eggs and tadpoles also are at serious risk of desiccation and stranding. All of this is occurring
 6 despite implementation of the Compliance Plan.

7
 8 24. It is my professional opinion that in order to reduce take of California red-legged frogs
 9 in the future, the relief requested by Plaintiffs in this motion must be granted. Specifically, San
 10 Francisco must be ordered to cease all pumping at Sharp Park. The best way to safeguard the
 11 frog is to reduce unnatural variation in pond levels which is known to increase egg mortality.
 12 These frogs evolved with naturally fluctuating water levels in ponds, the best thing we can do to
 13 insure their survival and recovery is to let the water levels at Sharp Park vary naturally.

14
 15 25. Based on the stable isotope food web research done by my lab, as well as my
 16 understanding of CRLF biology and habitat requirements, it is also my professional opinion that
 17 mowing Sharp Park lands, particularly lands along the edge of aquatic features, is taking
 18 California red-legged frogs by significantly modifying the frog's habitats to the point where
 19 individual animals are killed or injured by impeding significant behavior functions, particularly
 20 feeding. As noted, our recent research demonstrated that for postmetamorphic individuals, the
 21 CRLF's diet consists mostly of terrestrial insects, which are produced and in many cases also
 22 obtained in terrestrial habitat. Mowing in these areas, therefore, is interfering with these
 23 essential life functions. Moreover, it is also my professional opinion that mowing in these areas
 24 is reasonably certain to take SFGS in Sharp Park, since the CRLF is a significant prey species for
 25 the SFGS. The City's Compliance Plan, which provides an inadequate monitoring protocol prior
 26 to certain mowing, would not avoid the significant risks of take even were it being implemented,
 27
 28

1 particularly given the massive scale of mowing in the vicinity of water features and the large
2 scale habitat modification mowing causes.

3 26. This is why the plaintiffs requested relief is essential to protect the California red-
4 legged frog and San Francisco gartersnake. The plaintiffs request to cease all mowing within
5 roughly 200 meters of the delineated wetland boundary area will provide a large swath of buffer
6 and edge habitat that will be free from mowing and wheels that could compress and take
7 endangered frogs and snakes. Although I certainly believe a much larger buffer area would
8 provide even further protection for the species, this will significantly diminish the risks as
9 compared to current golf course operations.
10

11 27. If this relief is provided, it is my professional opinion that the probability of ongoing take
12 as a result of golf course operations, while not eliminated, will be substantially reduced.
13

14 Pursuant to 28 U.S.C. § 1746, I hereby declare under penalty of perjury that the
15 foregoing is true and correct to the best of my knowledge and belief.
16

17 Executed on this _____ day of September, 2011. _____
18

19 Vance Vredenburg
20

21 I, Brent Plater, hereby attest that Vance Vredenburg's concurrence in the e-filing of this
22 document has been obtained.
23

24 Executed on: September 23, 2011


25 Brent Plater
26
27
28

EXHIBIT A

Vance Thomas Vredenburg
Assistant Professor
Department of Biology
San Francisco State University

Research Area:

Amphibian ecology, evolution and conservation, disease ecology, food webs

University Address:

Department of Biology, 1600 Holloway Avenue, HH 754; San Francisco, CA 94132, USA; Email: vancev@sfsu.edu; Telephone: 415-338-7296
Web pages: <http://biology.sfsu.edu/people/vance-vredenburg>
http://web.me.com/vancevredenburg/Vances_site/Home.html

Education

- PhD, University of California, Berkeley (Integrative Biology), Dec 2002 "The effects of introduced trout and ultraviolet radiation on anurans in the Sierra Nevada" Co-advisors: Dr Mary E Power and Dr David B Wake
- BA, University of California, Santa Barbara (Biology), 1992

Professional background

- 2007- to present *Assistant Professor* Department of Biology, San Francisco State University
- 2007- to present *Research Associate* Museum of Vertebrate Zoology, University of California Berkeley
- 2008- to present *Research Associate* California Academy of Sciences, San Francisco, California, USA
- 2003-2007 *Postdoctoral Scholar* Department of Integrative Biology and Museum of Vertebrate Zoology, University of California Berkeley
- 1998-to present *Co-Founder and Associate Director* of AmphibiaWeb.org an online bioinformatics project promoting science and conservation of the world's amphibians

Research Grants (currently funded)

2011-2013 National Science Foundation, (DEB) *The effects of climate change and fungal disease on Andean montane frogs*, V Vredenburg (PI)

2011-2012 The Rufford Small Grants Foundation, Grants for Nature Conservation, *Conservation of montane forest anurans in Southeastern Peru*, V Vredenburg (co-PI)

2007-2012 National Science Foundation, (DEB) *After the crash: factors allowing host persistence following outbreaks of a highly virulent disease*, C Briggs (PI), C Murray (co-PI), P Knapp (co-PI), V Vredenburg (co-PI)

2008-2010 CalFed-Bay Delta Program *Climate change impacts to San Francisco Bay-Delta wetlands: Links to pelagic food webs and predictive responses based on landscape modeling* T Parker (PI), J Callaway (co-PI), M Kelli (co-PI), V Vredenburg (co-PI)

Publications (*SFSU Master's student; *SFSU Undergraduate student)

In Review

1. Catenazzi, A, E Lehr, and VT Vredenburg *Thermal physiology fails to link climate warming to enigmatic amphibian declines in neotropical mountains* (PNAS)
2. Reeder, NMM, AP Pessier, and VT Vredenburg *Pathogen resistance identifies reservoir species and its role in infectious disease outbreaks in amphibians* (PNAS)
3. Woodhams, DC, Rollins-Smith, LA, Reinert, LK, Lam, BA, Harris, RN, Briggs, CJ, Vredenburg, VT; Caprioli, RM Chaurand, P *Microbial biotherapy causes immunomodulation of breviniin-1Ma, a novel antifungal peptide from the skin of mountain yellow-legged frogs, Rana muscosa* (Peptides)
4. Woodhams, DC, Geiger, CC, Reinert, LK, Rollins-Smith, LA, Lam, BA, Harris, RN, Briggs, CJ, Vredenburg, VT; Voyles, J *Treatment of amphibians with chytrid fungus: learning from failed trials with itraconazole, antimicrobial peptides, bacteria, and heat therapy* (Diseases of Aquatic Organisms)
5. Bishop*, MR, RC Drewes, and VT Vredenburg *Stable isotope approach illustrates the importance of terrestrial prey to the California red-legged frog* (Ecology)

In Press

1. Vásquez Almazán, CR, and VT Vredenburg (2011) Discovery of the lethal amphibian fungal pathogen, *Batrachochytrium dendrobatidis*, in a direct-developing salamander in Guatemala *Herpetological Review*

Published

1. Swei, A, JJJ Rowley, D Rödder, MLL Diesmos, AC Diesmos, CJ Briggs, R Brown, TT Cao, TL Cheng*, B Han, J Hero, DH Hoang, MD Kusri, TTD Le, M Meegaskumbura, T Neang, SPhimmack, D Rao, NMM Reeder*, SD Schoville, N Sivongxay, N Srei, M Stöck, B Stuart, L Torres*, TAD Tran, TS Tunstall, D Vieites, and VT Vredenburg (2011) Is Chytridiomycosis an Emerging Infectious Disease in Asia? *PLoS ONE* 6(8): e23179 doi:10.1371/journal.pone.0023179
2. Cheng*, TL, S Rovito, DB Wake and VT Vredenburg Coincident mass extinction of neotropical amphibians with the emergence of the fungal pathogen *Batrachochytrium dendrobatidis* 2011 *Proceedings of the National Academy of Sciences* 108(23):9502-9507
 - a) *Review of Cheng et al 2011*: Lips KR 2011 Museum collections: Mining the past to manage the future *Proceedings of the National Academy of Sciences USA* 108(23):9323-9324
 - b) Cheng, et al. 2011 won the *Best Student Paper Award* at the Ecological Society of America general meeting 2011
3. Schoville, SD, TS Tunstall, VT Vredenburg, AR Backlin, DA Wood, RN Fisher 2011 Conservation of evolutionary lineages of the endangered mountain yellow-

- legged frog, *Rana muscosa* (Amphibia: Ranidae), in southern California *Biological Conservation* 144:2031-2040
4. Reeder*, NMM, TL Cheng*, VT Vredenburg, and DC Blackburn 2011 Survey of the chytrid fungus *Batrachochytrium dendrobatidis* from montane and lowland frogs in eastern Nigeria *Herpetology Notes* 4:83-86
 5. Catenazzi A, E Lehr, LO Rodriguez, and VT Vredenburg 2011 *Batrachochytrium dendrobatidis* and the collapse of anuran species richness and abundance in the upper Manu National Park, southeastern Peru *Conservation Biology* 25: 382-391
 6. Catenazzi, A, VT Vredenburg, and E Lehr 2010 *Batrachochytrium dendrobatidis* in the live frog trade of Telmatobius (Anura: Ceratophryidae) in the Tropical Andes *Diseases of Aquatic Organisms* 92:187-191
 7. Blackburn, DC, B J Evans, AP Pessier, VT Vredenburg 2010 An enigmatic mass mortality event in the only population of the Critically Endangered Cameroonian frog *Xenopus longipes* (Anura: Pipidae) *African Journal of Herpetology* 59:1-12
 8. Vredenburg, VT, LM Chan, T Tunstall, and JM Romanic 2010 Does UV-B radiation affect embryos of three high-elevation amphibian species in California? *Copeia* 2010:502-512
 9. Lam, BA, J B Walke, VT Vredenburg, and RN Harris 2010 Proportion of individuals with anti-*Batrachochytrium dendrobatidis* skin bacteria is associated with population persistence in the frog *Rana muscosa* *Biological Conservation* 143 (2010):529-531
 10. Vredenburg, VT, RA Knapp, T Tunstall, and CJ Briggs 2010 Dynamics of an emerging disease drive large-scale amphibian population extinctions *Proceedings of the National Academy of Sciences* 107:9689-9694
Reviews and other significant citations of Vredenburg et al 2010:
 - a) Blaustein, AR and PTJ Johnson 2010 When an infection turns lethal *Nature* 465:881-882
 - b) Jeremy, A 2010 Epidemiology: It's not easy being green *Nature Reviews Microbiology* 8:467
 - c) Kinney, V C, J L Heemeyer, A P Pessier, and M J Lannoo 2011 Seasonal pattern of *Batrachochytrium dendrobatidis* infection and mortality in *lithobates areolatus*: Affirmation of Vredenburg's "10,000 zoospore rule" *PLoS ONE* 6(3):e16708
 11. Briggs, CJ, RA Knapp, and VT Vredenburg 2010 Enzootic and Epizootic Dynamics of the Chytrid Fungal Pathogen of Amphibians *Proceedings of the National Academy of Sciences* 107:9695-9700
 12. Harris, RN, RM Brucker, JB Walke, MH Becker, CR Schwantes, DC Flaherty, BA Lam, DC Woodhams, CJ Briggs, VT Vredenburg, KPC Minbiole 2009 Skin microbes on frogs prevent morbidity and mortality caused by a lethal skin fungus *The ISME Journal* 3:818-824
 13. Wake, DB, and VT Vredenburg 2008 Are we in the midst of the sixth mass extinction? A view from the world's amphibians *Proceedings of the National Academy of Sciences* 105:11466-11473
 14. Frías-Álvarez P, V T Vredenburg, M Familiar-Lopez, JE Longcore , E Gonzalez-Bernal, G Santos-Berrera, L Zambrano, and G Parra-Olea 2008 Chytridiomycosis survey in wild and captive Mexican amphibians *EcoHealth* 5: 18-26

15. Morgan, JAT, VT Vredenburg, LJ Rachowicz, RA Knapp, MJ Stice, T Tunstall, RE Bingham, JM Parker, JE Longcore, C Moritz, CJ Briggs, JW Taylor 2007 Population genetics of the frog killing fungus *Batrachochytrium dendrobatidis* *Proceedings of the National Academy of Sciences* 104(34): 13845-13850
16. Woodhams, DC, VT Vredenburg, M Simon, D Billheimer, B Shakhtour, Y Shyr, CJ Briggs, LA Rollins-Smith, RN Harris 2007 Symbiotic bacteria contribute to innate immune defenses of the threatened mountain yellow-legged frog, *Rana muscosa* *Biological Conservation* 138: 390-398
17. Finlay, JC and VT Vredenburg 2007 Introduced trout sever trophic connections in watersheds: consequences for a declining amphibian *Ecology* 88(9): 2187-2198
18. Vredenburg, VT, R Bingham, R Knapp, JAT Morgan, C Moritz, and D Wake 2007 Concordant molecular and phenotypic data delineate new taxonomy and conservation priorities for the endangered mountain yellow-legged frog (Ranidae: *Rana muscosa*) *Journal of Zoology* 271(4): 361-374
19. Knapp, RA, DM Boiano, and VT Vredenburg 2007 Recovery of a declining amphibian (mountain yellow-legged frog, *Rana muscosa*) following removal of nonnative fish *Biological Conservation* 135: 11-20
20. Rollins-Smith, LA, DC Woodhams, LK Reinert, VT Vredenburg, CJ Briggs, PF Nielsen, and JM Conlon 2006 Antimicrobial Peptide Defenses of the Mountain Yellow-Legged Frog (*Rana muscosa*) *Developmental & Comparative Immunology* 30(9): 831-842
21. Rachowicz, LJ, RA Knapp, JAT Morgan, MJ Stice, VT Vredenburg, JM Parker and CJ Briggs 2006 Emerging infectious disease as a proximate cause of amphibian mass mortality *Ecology* 87(7): 1671-1683
22. Briggs, C, VT Vredenburg, RA Knapp, and LJ Rachowicz 2005 Investigating the population-level effects of chytridiomycosis, a fungal disease of amphibians *Ecology* 86(12):3149-3159
23. Rachowicz, LJ, JM Hero, JAT Morgan, VT Vredenburg, J Taylor, CJ Briggs 2005 The novel and endemic pathogen hypothesis: explanations for the origin of an emerging infectious disease of wildlife *Conservation Biology* 19(5):1441-1448
24. Vredenburg, VT 2004 Reversing introduced species effects: Experimental removal of introduced fish leads to rapid recovery of declining frog *Proceedings of the National Academy of Sciences* 101(20):7646-7650
25. Rachowicz, LJ and VT Vredenburg 2004 Transmission of *Batrachochytrium dendrobatidis* within and between amphibian life stages *Diseases of Aquatic Organisms* 61:75-83
26. Macey, JR J Stasburg, J Brisson, VT Vredenburg, M Jennings, and A Larson 2001 Molecular phylogenetics of western North American frogs of the *Rana boylei* species group *Molecular Phylogenetics and Evolution* 19(1):131-143
27. Vredenburg, VT, T Tunstall, H Nguyen, J Romanic and S Schoville 2001 *Hydromantes platycephalus* (Mt Lyell salamander) *Herpetological Review* 32:178
28. Vredenburg, VT, and AP Summers 2001 Field Identification of chytridiomycosis in *Rana muscosa* *Herpetological Review* 32:151-152

29. Vredenburg, VT 2000 Natural History Notes: *Rana muscosa* (mountain yellow-legged frog), conspecific egg predation *Herpetological Review* 31:170-171
30. Vredenburg, V T, Y Wang, and G Fellers 2000 Scientific meeting raises awareness of amphibian decline in Asia *FrogLog* 42: 2-3
31. Knapp, R A, V T Vredenburg, and K M Matthews 1998 Effects of stream channel morphology on golden trout spawning habitat and recruitment *Ecological Applications* 8(4):1104-1117
32. Knapp, RA, and VT Vredenburg 1996 A field comparison of the substrate composition of golden trout redds using two sampling techniques *North American Journal of Fisheries Management* 16:674-681
33. Knapp, RA, and VT Vredenburg 1996 Spawning by California golden trout: characteristics of spawning fish, seasonal and daily timing, redd characteristics, and microhabitat preferences *Transactions of the North American Fisheries Society* 125(4):519-531
34. Knapp, RA, PC Sikkil, and VT Vredenburg 1995 Age of clutches in nests and the within nest spawning-site preferences of three damselfish species (Pomacentridae) *Copeia* (1995):78-88

Book Chapters and other publications In Press 2011

1. Catenazzi, A, E Lehr, LO Rodriguez, and VT Vredenburg Amphibian Disease in the Peruvian Andes 2011 *Smithsonian Institution Scholarly Press*
2. Vredenburg, VT, M Koo, K Whittaker, and DB Wake 2011 Global Declines of Amphibians *In Encyclopedia of Biodiversity* Elsevier Press
3. Cheng, TL, S Rovito, DB Wake and VT Vredenburg (*In Press*) Museum specimens reveal spread of pathogen and collapse of amphibians in Central America *Froglog*
4. A Swei, JLL Rowley, D Rödder, MLL Diesmos, AC Diesmos, C) Briggs, R Brown, TT Cao, TL Cheng*, B Han, J Hero, DH Hoang, MD Kusri, TTD Le, M Meegaskumbura, T Neang, SPHimmack, D Rao, NMM Reeder*, SD Schoville, N Sivongxay, N Srei, M Stöck, B Stuart, L Torres*, TAD Tran, TS Tunstall, D Vieites, and VT Vredenburg (*In Press*) Prevalence and distribution of chytridiomycosis throughout Asia *FroLog* 98

Book Chapters and other publications

1. Vredenburg, V. T., C. J. Briggs, and R. N. Harris. 2011. Host-pathogen dynamics of amphibian chytridiomycosis: The role the skin microbiome in health and disease *In Fungal diseases: An emerging threat to human, animal and plant health*, edited by L. Olsen, E. R. Choffnes, D. A. Reiman and L. Pray. Washington, D.C.: The National Academies Press IOM (Institute of Medicine). Pp. 342-355.
2. Vredenburg, VT, MS Koo, and DB Wake 2008 Declines of amphibians in California *In Hoffman, M (Ed), Threatened Amphibians of the World* Lynx Ediciones, Barcelona, Spain, pp 126
3. Vredenburg, VT, G Fellers, and C Davidson 2005 The mountain yellow-legged frog (*Rana muscosa*) *In Lannoo, MJ (Ed), Status and Conservation of US Amphibians* University of California Press, Berkeley, California, USA, pp 563-566
4. Vredenburg, VT, M McDonald, & T Sayre (2010) *Amphibians and Climate Change* *Natural Sciences* 6(1):10-12

Teaching Experience at SFSU

- Ecology (BIOL 482) 40-60 undergraduates
- Ecology and Evolution Seminar (BIOL 862) 12-18 graduate students
- Vertebrate Evolution and Natural History (BIOL 470) 20 undergraduates

Student Mentoring**Master's Students-Chair****Completed**

1. Natalie Reeder; *Potential role of the pacific chorus frog in the spread of chytridiomycosis disease* (6-25-2010) [This thesis was San Francisco State University's nomination for the 2010 Western Association of Graduate Studies Distinguished Master's Thesis Award 2010]
2. Tina Cheng; Title: *The effects of chytridiomycosis disease on Central American salamanders* (please see publication #2, published in PNAS; winner Ecological Society of America **BEST STUDENT PAPER 2011**)
3. Meghan Bishop*; Title: *Habitat use and conservation of red-legged frogs in coastal California* (*Official Chair was Dr R Drewes at the California Academy of Sciences)

In progress

1. Sam McNally; *Tracking the spread of Batrachochytrium dendrobatidis through amphibians in California's Sierra Nevada*
2. Stephanie Hyland; *Development of a rapid PCR Assay for Janthinobacterium lividum, a bacterium that occurs symbiotically on amphibian skin*
3. Raul Figueroa; *Was the fungal pathogen, Batrachochytrium dendrobatidis, spread throughout Asia by the amphibian food and pet trade?*
4. Celeste Dodge; *Effects of a fungal pathogen on the Yosemite Toad (Bufo canorus)?*
5. Danqing Shao; *Investigating the role of introduced American Bullfrogs in the spread chytridiomycosis disease in Chinese amphibians?*
6. Gabriela Rios-Sotelo; *Did the fungal pathogen Batrachochytrium dendrobatidis originate from Japan?*
7. Angel Jacobo Pereira; *The amphibian chytrid pathogen Batrachochytrium dendrobatidis in Guatemala*

Master's Students-Committee Member**Completed**

1. Kim Vincent (Chair E Routman), *The effects of pesticides on tadpoles*
2. Anthony Chazar (Chair Dr R Seghal), *Effects of deforestation on the prevalence and diversity of blood parasites in two African rainforest birds*
3. Maria Tonione (Chair E Routman), *Microsatellite variation in the hellbender, Cryptobranchus alleganiensis*
4. Jenny Carlson (Chair R Seghal), *Evolution of blood pathogens*
5. Hazel Thwin (Chair J Dumbaucher), *Ornithology of Myanmar*
6. Molly Dodge (Chair R Seghal), *Transmission of haemosporidian pathogens in resident and migrating birds*
7. Holly Archer (Chair R Seghal), *Emerging infectious disease and blood parasite prevalence in countryside birds*

Vredenburg 7
Curriculum Vitae

8. Stephen Micheletti (Chair E Routman), *Population structure of Side-blotched Lizards* (Uta stansburiana): *Displaying adaptive dorsal coloration*

In progress

1. Alexandra Vasquez Ochoa; El ensamblaje de anfibios en 13 localidades de la region Andina central oriental, Orinoquia y Amazonia de Colombia; Pontificia Universidad la Javeriana, Bogota, Colombia

PhD Students-Committee Member

In progress

1. Brooke Talley (Chair K Lips, Southern Illinois University), *Distribution of Batrachochytrium dendrobatidis in amphibians of Illinois*

Service

University Level

1. San Francisco State University Academic Senator (elected Fall 2011)
2. Curriculum Review and Approval Committee

Departmental Level

1. Undergraduate General Biology Major advisor

Graduate Student advising

1. Weekly lab meetings in Vredenburg Lab, students participate in reading and evaluating recent scientific publications, present updates on student and lab projects and report on animal status in the SFSU animal care facility
2. Weekly individual meetings with graduate students

New Course Development

1. Biol 470 Evolution and Natural History of Vertebrates - course includes lectures, weekly laboratories and field trips (This course uses preserved museum specimens maintained at SFSU by Vredenburg)

Committee work

1. CRAC -Curriculum Review and Approval Committee
2. Biology Undergraduate and Graduate Scholarship Committee (2009-2010)
3. CSU System-wide Student Research Competition (2009-2010)
4. Undergraduate Curriculum Committee (2008-2010)
5. Judge for the College of Science and Engineering Project Showcase (2009-2010)
6. Biology Chair Evaluation Committee (2011)

Synergistic Activities

1. Co-Founder and Associate Director: www.AmphibiaWeb.org an online research and conservation resource for the world's amphibians This site has an average of 20,000+ successful queries per day by students, conservation scientists, and the general public
2. Faculty Sponsor at SFSU for 7 graduate students (see below) and 9 undergraduate students (4 undergraduates are underrepresented minority students receiving funding from NSF and NIH)
3. Provided training in the form of lectures, field trips and lab methodology in Spanish to students and faculty in Latin America (Training Course on Quantitative PCR Detection of Chytridiomycosis, Mexico City, Mexico, at

UNAM, for the Red de Análisis para los Anfibios Neotropicales AMANIZ, and in Guatemala City, Guatemala for the Museo de Historia Natural, Univ de San Carlos de Guatemala; and to professors and students at Pontificia Universidad la Javeriana, Bogota, Colombia)

Public Outreach/Education/News coverage of the Vredenburg Lab

Television

1. Animal Planet: *The Vanishing Frog* with Jeff Corwin; 11-20-09
2. ABC-News; CNN; CBS Evening News (various appearances)

Radio

1. NPR-Science Friday-*Modern Extinctions* (KQED; 5-14-10)
2. WALO 1240 AM Radio Puerto Rico (6-22-10)- in Spanish

Movie Documentaries

1. NSF Science Nation (*Disappearing Frogs: Trying to save the world's amphibians*, by Miles O'Brien and Marsha Walton; 11-2-09)
2. NPR KQED QUEST (*Disappearing Frogs*; 5-15-08)

Print/News media

1. National Geographic Magazine (4-1-09); *The Vanishing* by Jenny Holland
2. New York Times (05-10-10); *Toiling against a deadly disease to save a threatened frog* by Erica Rex
3. Popular Science (in press); *Can skin microbes save our frogs?* By Susannah Locke
4. GEO Magazine (Germany; 07/01/10); *Amphibians in Crisis* by Markus Wolff
5. National Parks Magazine (2011)
6. Audubon Magazine (in press)
7. Deep-Sea News (volume5: 9-12-2011)

Biology Textbook featuring Vredenburg research

1. Campbell, NA, & Reece, J B (*In Press*) *Biology*, Benjamin Cummings, 8th edition pp650-651 (*This is the most commonly used Biology textbook in Introductory Biology Courses in the USA*)

Collaborators & Other Affiliations

1. Collaborators and Co-Editors J Taylor, C Moritz (UC Berkeley); R Knapp, C Briggs (UC Santa Barbara), E Rosenblum (U Idaho)
2. Graduate and Postdoctoral Advisors PhD co-advisors Mary Power and David Wake (UC Berkeley); postdoc advisor Cheryl Briggs (UC Santa Barbara)
3. Thesis Advisor and Postgraduate-Scholar Sponsor Master's students: completed (3) Natalie Reeder (6-25-10); Tina Cheng (6-25-11), Meghan Bishop (5-22-11) current (7) Celeste Dodge, Raul Figueroa*, Stephanie Hyland*, Danquing Shao, Gabriela-Rios-Sotelo*, Sam McNally, and Angel J. Pereira* (*underrepresented minority)

Reviewer

1. National Science Foundation (two Panels)
2. National Geographic (research grants)
3. Scientific Journals
 - a) *Proceedings of the National Academy of Sciences*
 - b) *Nature*

- c) *Public Library of Science Biology*
- d) *Public Library of Science Pathogens*
- e) *Journal of Animal Ecology*
- f) *Conservation Biology*
- g) *Herpetologica*
- h) *Journal of Herpetology*
- i) *Diseases of Aquatic Organisms*
- j) *The Herpetological Journal*

Invited presentations/lectures

1. Special Forums

- a) National Academy of Sciences/Institute of Medicine, Dec 2010 *Forum on Microbial threats: Fungal Diseases; Washington, DC*

2. Departmental Seminars

- a) 2011 Universidad de los Andes, Bogota, Colombia
- b) 2011 La Javeriana University, Bogota, Colombia
- c) 2011 California Academy of Sciences
- d) 2010 University of Nevada Reno, Dept of Biology
- e) 2009 University of San Francisco, Dept of Biology
- f) 2008 Department of Zoology; Southern Illinois University
- g) 2008 Department of Biology; Museo de Historia Natural, Guatemala City, Guatemala
- h) 2007 Department of Biology; University of Puerto Rico, PR USA
- i) 2005 Department of Ecology and Evolution; University of California Santa Cruz
- j) 2002 Department of Ecology and Evolutionary Biology; University of Connecticut

1. Scientific Meetings

- a) 2012 *World Congress of Herpetology - symposium presentation*
- b) 2011 *Ecological Society of America - symposium presentation*
- c) 2009, 2011, 2012 *Integrative Research Challenges in Environmental Biology; Amphibian declines and chytridiomycosis; Arizona State University, Tempe, Arizona*
- d) 2007 *Partners in Amphibian and Reptile Conservation; Amphibian declines and chytridiomycosis; Tempe, Arizona*

Symposium Organizer

- 1. 2012 World Congress of Herpetology: Reversing the effects of introduced species on amphibians
- 2. 2007 Ecological Society of America: Disease emergence and amphibian decline: using ecology to understand patterns and promote restoration; San Jose, California
- 3. 2005 Declining Amphibian Population Task Force; Berkeley, California
- 4. 2000 Amphibian Conservation; 4th Asian Herpetological Conference; Chengdu, China

Provided qPCR Prep and Analysis Training

- 1. NSF Collaborative Network

- a) The Research and Analysis Network for Neotropical Amphibians (Red de Análisis para los Anfibios Neotropicales Amenazados); Training Course on Quantitative PCR (Q-PCR) Detection of Chytridiomycosis; invited by Dr Gabriela Parra (Univ Nacional Autonoma de Mexico) Course co-funded by NSF and the IUCN Amphibian Specialist Group
- 2. Faculty - Pontificia Universidad la Javeriana, Bogota, Colombia
- 3. Postdocs - UC Berkeley; Gonzaga University; Smithsonian Institution
- 4. Graduate students - Universidad Nacional Autonoma de Mexico (UNAM), Mexico City, Mexico; Southern Illinois University; Museo de Historia Natural, Guatemala City, Guatemala; Pontificia Universidad la Javeriana, Bogota, Colombia

EXHIBIT B



EXHIBIT B, p. 1
Declaration of Vance Vredenburg
February 23, 2011, 11:01am
Southeastern Shore of Horse Stable Pond, Sharp Park Golf Course



EXHIBIT B, p. 2
Declaration of Vance Vredenburg
February 23, 2011, 11:01am
Southeastern Shore of Horse Stable Pond, Sharp Park Golf Course

EXHIBIT F



Kamman Hydrology & Engineering, Inc.
7 Mc Lennan Drive, Suite 2250, San Rafael, CA 94903
Telephone: (415) 461-9800
Facsimile: (415) 880-1538
E-mail: Greg@KHE-inc.com

August 3, 2012

Ryan Olah, Chief
Coastal Division Branch
U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, CA 95825

Jane Hicks, Chief
Regulatory Division
U.S. Army Corps of Engineers
San Francisco District
1455 Market Street, 16th Floor
San Francisco, CA 94103

Subject: Technical Review Comments to Biological Assessment
Sharp Park Safety, Infrastructure Improvement and Habitat Enhancement Project

Dear Mr. Olah and Ms. Hicks:

I have reviewed the subject Biological Assessment (BA) prepared by Recreation and Park Department, City and County of San Francisco, dated March 14, 2012. In addition, my firm and I have completed numerical storm modeling in an effort to evaluate the benefits and/or impacts associated with proposed project actions. The reason for this letter is two-fold. First, because my firm's work and study conclusions are cited within the BA, as well as having a unique knowledge of the site, I would like to clarify and elaborate on selected sections within the BA. Secondly, based on our analyses, it is my opinion that some of the key proposed actions in the BA intended to reduce flooding and improve California red-legged frog and San Francisco gartersnake habitat would fail at providing the desired benefits and may adversely affect these species. Specifically, my analyses indicate the following.

- Removing vegetation from the connector channel will increase the flow rate from Horse Stable Pond to Laguna Salada during the early parts of storm events, causing the water level in Laguna Salada to reach a maximum level sooner under BA conditions than currently exists.
- The maximum simulated water level attained in Laguna Salada under BA project conditions is about 0.2-feet higher than the existing condition simulated water level for a one inch storm event. This means that the extent of flooded area within Laguna Salada and near the golf course associated with a one inch rainfall

storm event will be larger under proposed BA project conditions than existing conditions.

- The maximum simulated 2- and 5- year storm water levels attained in Laguna Salada during the proposed BA project conditions reach the same elevation that water levels reach under existing conditions, just sooner. This means that the extent of flooded area associated with these storm events remains virtually the same between existing and BA project conditions.
- Simulation results indicate that removal of vegetation from the connector channel does not lead to faster drainage of water or reduced duration of inundation in Laguna Salada and the golf course area between existing and proposed BA project conditions. Therefore, the associated conversion of cover habitat to open water habitat for CRLF would not provide any reduction in the extent or duration of flooding in LS and the surrounding golf course.

My comments associated with specific sections of the BA and rationale for my conclusions are provided below after a paragraph summarizing my credentials.

I am a hydrologist with over twenty five years of technical and consulting experience in the fields of geology, hydrology, and hydrogeology. I have been providing professional hydrology services in California since 1991 and routinely manage projects in the areas of aquatic ecosystem restoration planning and design, surface- and groundwater hydrology, water supply, water quality assessments, water resources management, and geomorphology. Most of my work is located in the Coast Range watersheds of California, including the Northern and Southern San Francisco Bay Counties. My areas of expertise include: characterizing and modeling watershed-scale hydrologic and geomorphic processes; evaluating surface- and ground-water resources/quality and their interaction; assessing hydrologic, geomorphic, and water quality responses to land-use changes in watersheds and causes of stream channel instability; and designing and implementing field investigations characterizing surface and subsurface hydrologic and water quality conditions. I co-own and operate the hydrology and engineering consulting firm Kamman Hydrology & Engineering, Inc. in San Rafael, California (established in 1997). I earned a Master of Science in Geology, specializing in Sedimentology and Hydrogeology as well as an A.B. in Geology from Miami University, Oxford, Ohio. I am a Certified Hydrogeologist (CHg) and a registered Professional Geologist (PG). I am also very familiar with Sharp Park. In 2009 my firm was retained by Tetra Tech of Portland, Oregon on behalf of the San Francisco Recreation and Parks Department to prepare a hydrological report for Sharp Park. Our work focused on characterizing conditions on the site and preparing a suite of analytical models that were used to a) evaluate hydrologic and drainage conditions, and b) design marsh, pond, and stream restoration alternatives that would benefit the California red-legged frog (CRLF) and the San Francisco gartersnake on the property. Our study is documented in a report¹

¹ Kamman Hydrology & Engineering, Inc., 2009, Report for the Hydrologic Assessment and Ecological Enhancement Feasibility Study, Laguna Salada Wetland System, Pacifica, CA. Prepared for Tetra Tech, Inc., San Francisco, CA, 30p.

summarizing our hydrologic assessment, salinity assessment, and storm response modeling for Sharp Park. In writing this report, I studied historic rainfall records, local surface runoff, pumping operations, and water storage capacity of Laguna Salada, Horse Stable Pond, Sanchez Creek, and Sharp Park as a whole.

The following sections provide comments to selected sections of the BA that warrant clarification and elaboration with respect to the feasibility of proposed project actions.

1. Section 2.2 Project Description – Elaboration on Historic and Future Conditions

On page 4, the BA states, "A seawall on the western boundary of Sharp Park eliminated the historic hydrologic connection between the Pacific Ocean and the wetlands complex." Prior to construction of the seawall, there was likely a higher degree of exchange of water between Pacific Ocean and the Laguna. The current seawall likely inhibits floodwater drainage to the Ocean and is the primary cause for the winter flooding of the Laguna and golf course. With the seawall in place, the current and future outflow from Sharp Park is primarily controlled by the Horse Stable Pond pumps and to a lesser degree on internal drainage features. I elaborate on how the proposed BA project actions will affect future drainage and flooding conditions below.

Based on my experiences in restoring wetlands (e.g., Giacomini Wetlands at Point Reyes National Seashore) and California red-legged frog habitat along the Central California coast (e.g., Mori Point ponds), I think it is important to point out that removing the Sharp Park seawall would not preclude frog habitat. Although there would be the introduction of salt water and initial loss of freshwater marsh and pond, coastal estuaries display an ocean-to-land continuum in salinity structure between marine, brackish and freshwater conditions. These habitats are transient, shifting oceanward in response to seasonal rains and freshwater input from inland drainages. In turn, there is a corresponding transition in suitable frog habitat, with frog habitat likely precluded in the high salinity ocean side water but suitable breeding and rearing habitat located a short distance inland. In my experiences at the Giacomini Project in Marin County, CRLF and designated CRLF habitat is found in very close proximity to high salinity waters. Work by Fellers and Kleeman² at the Park documented how frogs move seasonally over considerable distances between temporary bodies of water for breeding and nonbreeding habitat. Thus, I think it is important to acknowledge the frog's natural ability to breed on the fringe of tidal wetland areas.

² Fellers, G.M., and Kleeman, P.M., 2007, California red-legged frog (*Rana draytonii*) movement and habitat use implications for conservation. Journal of Herpetology, Vol. 41, No.2, pp. 271-281.

2. Section 2.2 Project Description – Clarification between Wet and Dry Season Controls Over Wetland Ponding

Page 4 of the BA states, "The wetlands are believed to be maintained by ground water but are also fed by surface water inflow due to precipitation in the winter. A flood control pump system in HSP affects water levels in that body, and it may affect water levels in LS when the channel connecting the two water bodies creates a surface water connection between them." These sentences should be clarified with respect to both the wet and dry seasons. The first sentence refers to wetland water supply during the summer, when groundwater contributions dominate because there is little to no surface water runoff. With regard to the second sentence, the exchange of water between Horse Stable Pond (HSP) and Laguna Salada (LS) is dramatically different during the wet and dry seasons. For example, through the dry season and after the Horse Stable pumps stop pumping, water levels decline in both ponds due to cessation of surface water inflow, declining groundwater inflow and increased evaporation. The highest measured elevation in the bed of the connector channel between HSP and LS is approximately 6.2-feet NAVD88. When water levels in either pond fall below this elevation, HSP and LS are segregated from each other and behave as two independent water bodies. The lowest observed stage in Laguna Salada that I am aware of is about 6.0-feet NAVD88 (Figure 6 in KHE 2009 report).

The BA project proposes, "Removal of sediment and emergent vegetation that impedes water flow and reduces habitat suitability for CRLF in selected locations with the connecting channel and culverts that link HSP and LS. This removal work would not exceed 480 cubic yards of removed sediment and vegetation within an area of approximately 6,500 square feet or 0.15 acres." (second bullet on page 7 of BA). If the BA action lowers the elevation of the bed of the channel that connects HSP and LS, it is possible that these water bodies will remain in hydraulic connection longer during the dry times of the year or at water levels below 6.2-feet in elevation. However, it is important to point out that during our 2008-2009 hydrologic investigation we measured the invert (lowest point) elevation of the culvert used to accommodate a golf cart path over the connector channel culvert at an elevation of 6.0-feet NAVD88. Thus, without lowering the culvert elevation, the hydraulic connection between the ponds can't be lowered below 6.0-feet NAVD88.

During winter high flows, the existing hydraulic connection between HSP and LS is much more dynamic. As part of our 2008-2009 hydrologic and hydraulic investigation of Sharp Park, we developed a calibrated numerical model that simulates water movement into and through the HSP-LS-Sharp Park complex. Our model was developed and calibrated using data collected during the storm of November 1, 2008, when we estimate a little over one inch of rainfall occurred. Using this model, we evaluated the effects of removing the vegetation and associated channel roughness that inhibits flow through the connector channel pursuant to the proposed BA project. This analysis included simulation of the November 1, 2008 storm and 24-hour storms having recurrence intervals of 2- and 5-years. Under existing conditions, we calibrated the numerical model using a connector channel roughness value of 0.15 (see pages 26-27 of KHE, 2009). In

order to simulate the effects of vegetation removal from the connector channel, we modified the numerical model by lowering the roughness coefficient to 0.035).³

The results of the three modeled storm simulations for existing and proposed BA project conditions are provided in Figures 1 through 3 and discussed below. The simulation results of each storm are presented on each Figure with two graphs of information per Figure. The upper graph on each Figure presents the existing and proposed BA project water levels in HSP, LS and connector channel over the storm period. The lower graph on each page presents the associated water flow rates out of HSP, flow at a point within the middle of the connector channel, flow rate into LS, and the cumulative pumping rate out of HSP to the Pacific Ocean. A negative flow rate in the lower graphic indicates that the flow direction through the connector channel is from HSP towards LS (i.e., water level in HSP is higher than LS). A positive flow rate on the lower graph indicates that flow is from LS to HSP (i.e., water levels in LS are higher than HSP).

Based on watershed mapping, field reconnaissance and runoff monitoring, we estimate that the amount of runoff to HSP during any given storm is approximately twice the magnitude as the runoff total to LS. In addition, the storage volume of HSP for any increment in water level rise is significantly less than that of LS. Thus, during the initiation and rising limb of a storm hydrograph, the water level in HSP rises much more quickly than the water level in LS. Because the water level in HSP is higher than LS, water then starts to drain out of HSP through the connector channel into LS. This phenomenon is observed even during the 1-inch storm event before water levels trigger the pump in HSP to start discharging water to the Pacific Ocean. Simulation results for the 2- and 5-year storm events indicate that inflow rates to HSP far exceed the discharge pump capacity, leading to higher incremental rises in water level and longer durations of flow from HSP into LS⁴. The main findings of the proposed BA project model simulations are as follows:

- Removing vegetation from the connector channel will increase the flow rate from HSP to LS during the early parts of storm events, causing the water level in LS to reach a maximum level sooner under BA conditions than currently exists.
- The maximum simulated water level attained in LS under BA project conditions reaches a water level elevation about 0.2-feet higher than during the existing condition simulation for a one inch storm event. This means that the extent of flooded area within LS and near the golf course associated with a one inch rainfall

³ It's important to note that we did not alter (deepen or widen) the channel geometry in an attempt to emulate changes associated with sediment removal because the BA does not provide sufficient detail regarding this type of work. However, based on our modeling and understanding of the water level responses to changes in channel conveyance capacity, I don't believe there would be any significant change in the rate of water level change if the channel were widened and/or deepened. Deepening the channel would allow Laguna Salada to be drained to a lower and comparable depth via pumping from Horse Stable Pond.

⁴ Simulations of pumping from HSP follow the pump operation "rules" implemented in 2008/09. Review of modeling results suggest that doubling the pump rate from HSP would roughly equal the inflow to HSP during the 2-year storm, but inflow during a 5-year storm would still overwhelm the system.

storm event will be larger under proposed BA project conditions than existing conditions.

- The maximum simulated 2- and 5- year storm water levels attained in LS during the proposed BA project conditions reach the same elevation that water levels reach under existing conditions, just sooner. This means that the extent of flooded area associated with these storm events remains virtually the same between existing and BA project conditions.
- Simulation results indicate that removal of vegetation from the connector channel does not lead to faster drainage of water or reduced duration of inundation in LS and the golf course area between existing and proposed BA project conditions. Therefore, the associated conversion of cover habitat to breeding habitat for CRLF would not provide any reduction in the extent or duration of flooding in LS and the surrounding golf course.

3. 2.2.1 Construction Action - Loss of Hydraulic Connection

On page 7 of the BA it states, "Because there is no surface water connection between these areas and LS, they cannot sustain CRLF through metamorphosis." This sentence is a bit unclear. Are the authors suggesting that it's the golf cart path that is limiting habitat or is it the available hydrology? In addressing the later, it is simply untrue that there is no surface water connection between the golf cart path area and Laguna Salada. The loss of hydrologic connectivity is a direct result of pumping from HSP. In the absence of pumping from HSP there would be a significant increase in the duration of flooding that would maintain connectivity in these areas over significant breeding periods. Based on Vandivere's Sharp Park Golf Course Inundation Area Map⁵, the golf cart path area becomes inundated when water levels reach between 7 and 8-feet NAVD88 or higher. Vandivere's map also indicates that when water levels reach this level, LS, the connector channel and HSP are all hydraulically connected. Our modeling simulation results support this interconnected condition at water levels of 7- to 8-feet and also indicate that this has the chance of occurring once every two years under the 2008/09 pumping regime, but likely more often. It is only through pumping from HSP that waters recede quickly and ponded cart path areas become isolated from the connector channel, LS and HSP. If no pumping were occurring at all from HSP, the areas within the elevation range in question would surely be inundated annually and for durations likely exceeding the metamorphosis period.

⁵ Vandivere, W. 2011. Declaration of William Vandivere, P.E. in Support of Defendants' Opposition to Plaintiffs' Motion for Preliminary Injunction. *Wild Equiv Institute, et al., v. City and County of San Francisco, et al.*, Case No. C 11-CV-00958-SI. 30 pp.

4. 2.2.1 Construction Action and Impact to Habitat Quality

On page 11 of the BA it states, "Repairs to the cart paths will involve moving the paths away from the wetland and into the golf course, installing interlocking pavers to support the downslope embankment and backfilling the area with drain rock to raise elevations." This description of work is very vague and unclear. Regardless, any fill placed in the area that raises the ground surface elevation will effectively reduce the frequency and duration of flooding at that raised area. Although it might only be a small change, it still would be a change reducing CDFG habitat. Areas covered in drain rock, even if they remain at the current elevation, may alter the substrate in a way that precludes emergent vegetation used to secure egg masses. As an aside, this area may be designated wetland by the Coastal Commission and the path relocation could constitute filling of wetland.

5. 3.2 Watershed Boundaries and Drainage Patterns

On page 31, the BA states, "The connecting channel between LS and HSP allows for water exchange at surface elevations greater than 6.2 feet (NAVD 88). Water exchange between the two water bodies is reduced by the hydraulic friction created by dense cattail growth (Kamman 2009). In some areas surrounding the wetlands and on the golf course, ponds or swales may form, which do not appear to have surface water connection to LS, HSP and the connecting channel. These ponds form immediately after rainfall events and may last for several days to several months." Again, like my response in item 2. above, the impact of vegetation on flow conveyance through the connector channel is really dependant on the water depth within the connector channel. Water depth in the connector channel depends on the season (wet or dry) and pumping from HSP. During periods when the water depth is well contained and shallow within the connector channel, the effects of vegetation on reducing flow conveyance are greatest. However, during these periods, there is no flooding of the golf course and no need to move water between LS and HSP any faster than already occurs. It is during the winter floods when water levels are approaching flood level of the golf course that are of concern. As demonstrated from our hydrologic modeling of storm events (see Figures 1 through 3) when water levels rise to an elevation of around 8-feet NAVD88, the saturated flow area and conveyance capacity within the connector channel increases to a level that far exceeds the rate of pumping from the HSP discharge pump, even with vegetation choked channels. In short, increasing the potential flow rate between LS and HSP when the golf course is at flood level makes no difference when the discharge pump from HSP can't keep up with the flows that are already delivered to the pump intake. Again, our modeling results indicate that even with a vegetation free channel, the depth and duration of flooding in Sharp Park will not change in response to the proposed BA project. Vegetation free channels will not change the frequency or area of pond/swale formation when the discharge capacity of the system can not keep up with the volume of inflow, even with improved water exchange between LS and HSP.

Our analyses indicate that the objective of restricting the formation of ponded areas and swales can be accomplished through implementation of the proposed BA project.

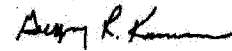
Therefore, frogs and egg-masses will continue to populate the ponds and swales equally under existing and proposed BA project conditions. The best available approach towards protecting and enhancing existing frog habitat, given existing infrastructure, is a reduced pumping regime from HSP that stops dewatering the ponded areas and swales given they will continue to form at an uninterrupted frequency. In essence, this approach works to preserve frog habitat by maintaining the ponds/swales instead of dewatering them.

6. 3.4.4 Wetland Dredging and Flood Hazard Reduction

Page 33 of the BA states, "Over the last several decades, the extent of this vegetation has increased, replacing the open water." Dredging tules from LS will convert certain areas from frog cover habitat to open water habitat. However, based on my analyses and understanding of the project site, it is my opinion that this action would not result in any meaningful or significant relief from flooding. Specifically, I don't believe that dredging tules from LS will lead to a significant reduction in flooded golf course area or flood duration.

If you have any questions or wish to discuss these opinions and conclusions further, please feel free to contact me.

Sincerely,



Gregory R. Kamman, PG, CHG
Principal Hydrologist

cc:

U.S. Army Corps of Engineers: Cameron Johnson, Ian Liffmann

U.S. Fish and Wildlife Service: Susan Moore, Jan Knight, Eric Tattersall, Cay Goude, Chris Nagano, and Josh Hull

California Coastal Commission: Renee Ananda and Karen Geisler

Figure 1: Flood model simulation results for project area for November 1, 2008 storm. Graphs plot results for densely and lightly vegetated connector channel simulations.

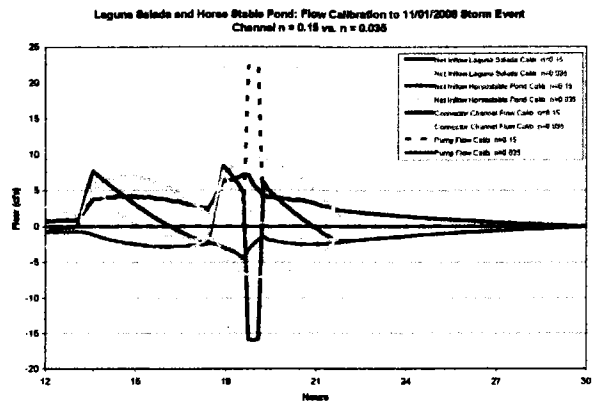
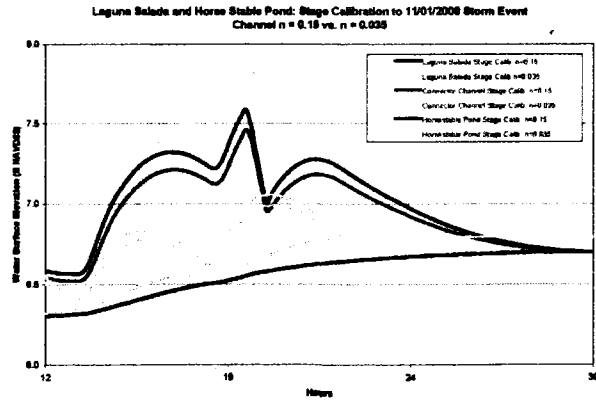


Figure 2: Flood model simulation results for project area for 2-Year storm. Graphs plot results for densely and lightly vegetated connector channel simulations.

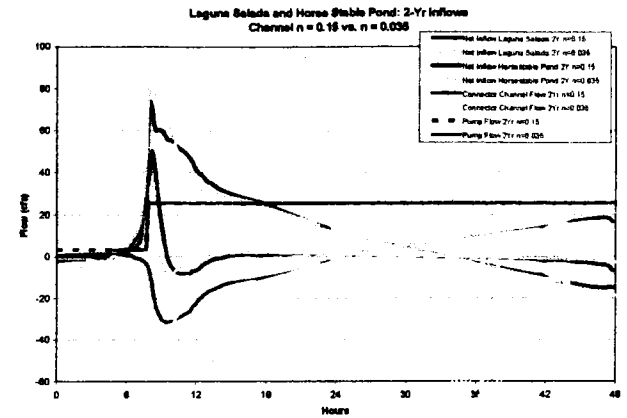
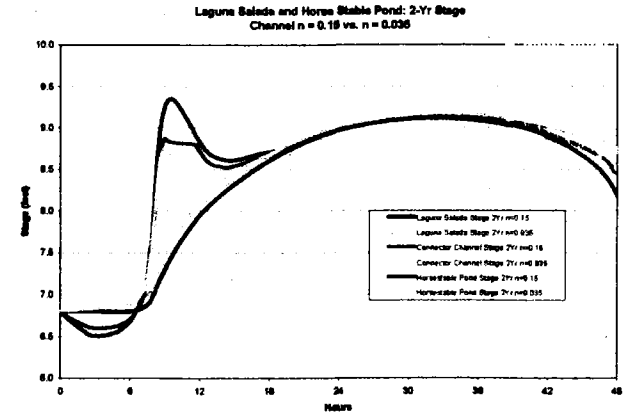
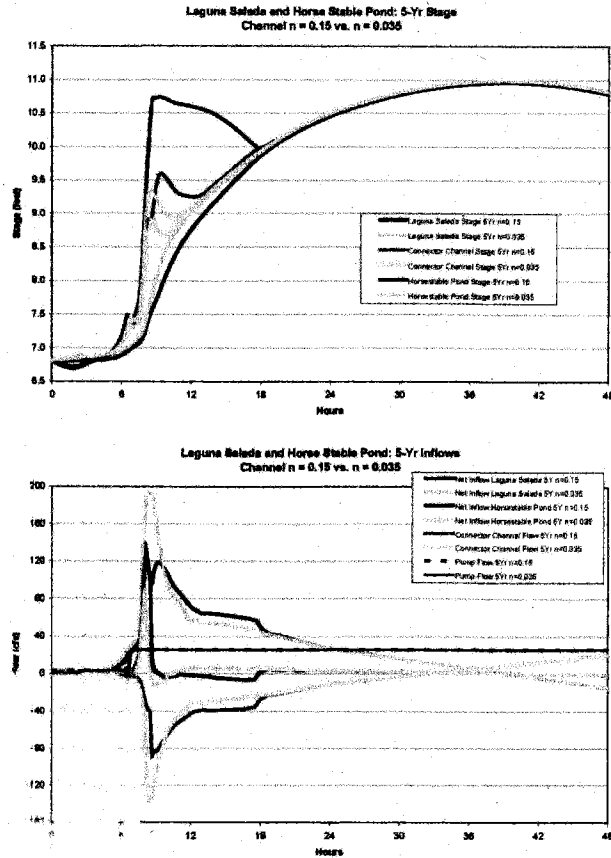


Figure 3: Flood model simulation results for project area for 5-Year storm. Graphs plot results for densely and lightly vegetated connector channel simulations.



UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
NORTHERN DIVISION

WILD EQUITY INSTITUTE, a non-profit
corporation, *et al.*

Plaintiffs,

v.

CITY AND COUNTY OF SAN
FRANCISCO, *et al.*,

Defendants.

Case No.: 3:11-CV-00958 SI

GREG KAMMAN EXPERT REPORT

1 I am submitting this expert report on behalf of plaintiffs in this case.

BACKGROUND AND QUALIFICATIONS

2 I am a hydrologist with over twenty five years of technical and consulting experience in
the fields of geology, hydrology, and hydrogeology. I have been providing professional
hydrology services in California since 1991 and routinely manage projects in the areas of
surface- and ground-water hydrology, water supply, water quality assessments, water resources
management, and geomorphology. Most of my work is located in the Coast Range watersheds
of California, including the Northern and Southern San Francisco Bay Counties. My areas of
expertise include characterizing and modeling watershed-scale hydrologic and geomorphic
processes; evaluating surface- and ground-water resources/quality and their interaction;
assessing hydrologic, geomorphic, and water quality responses to land-use changes in
watersheds and causes of stream channel instability; and designing and implementing field
investigations characterizing surface and subsurface hydrologic and water quality conditions. I
co-own and operate the hydrology and engineering consulting firm Kamman Hydrology &
Engineering, Inc. in San Rafael, California (established in 1997). I earned a Master of Science
in Geology, specializing in Sedimentology and Hydrogeology, as well as an A.B. in Geology
from Miami University, Oxford, Ohio. I am a Certified Hydrogeologist (CHG) and a registered
Professional Geologist (PG). My CV summarizing my qualifications, along with a list of
publications from the past 10 years, are attached as Ex. A. I am charging plaintiffs \$100 per

GREG KAMMAN EXPERT REPORT
3:11-CV-00958 SI

1 hour for the time I spend reviewing materials and providing deposition and trial testimony in
2 this matter. I have not been deposed or served as an expert witness in the past four years.

3 3. I am very familiar with Sharp Park. In 2009, my firm was retained by Tetra Tech of
4 Portland, Oregon on behalf of the San Francisco Recreation and Parks Department to prepare a
5 hydrological report for Sharp Park, attached as Ex. B. While producing this report, I reviewed a
6 previous study of Sharp Park and Laguna Salada, entitled "Laguna Salada Resource
7 Enhancement Plan," prepared by Philip Williams Associates in 1992. Our report expanded upon
8 Philip Williams Associates' earlier study by reflecting current conditions on the site and by
9 preparing a suite of analytical models that could be used to a) evaluate current hydrologic and
10 drainage conditions, and b) design marsh, pond, and stream restoration alternatives that would
11 benefit the California red-legged frog and the San Francisco gartersnake on the property. Our
12 report included a hydrologic assessment, a salinity assessment, and a storm response model for
13 Sharp Park. In writing this report, I studied historic rainfall records, local surface runoff,
14 pumping operations, and the water storage capacity of Laguna Salada, Horse Stable Pond,
15 Sanchez Creek, and Sharp Park as a whole. Our report considers, in part, the anticipated water
16 levels that can be expected in Sharp Park during various winter rain scenarios under current
17 pumping operations from Horse Stable Pond.

18 4. My expert testimony in this report is based on the resources described above, along with
19 water level monitoring data for Horse Stable Pond and Laguna Salada collected by my firm, the
20 Horse Stable Pond pump house log provided by the City and County of San Francisco in this
21 litigation, egg mass survey data collected by the City and County of San Francisco from 2005-
22 07, egg mass monitoring reports prepared by the GGNRA covering the years 2003-2005, and
23 2006-2009, water quality data for Sharp Park, the declaration provided by Dr. Marc Jennings in
24 opposition to plaintiffs' motion for preliminary injunction, Docket No. 68, and the associated
25 exhibits, and the declaration of William Vandivere in opposition to plaintiffs' motion for
26 preliminary injunction, Docket No. 66-2, and the associated exhibits. A list of all materials I
27 have relied upon in preparing this report is attached as Ex. C.

REQUESTED TESTIMONY

1 5. Plaintiffs have requested that I provide my expert opinion and testimony regarding the
2 questions. First, plaintiffs have asked me to describe the geologic and hydrologic forces that
3 cause Sharp Park Golf Course to flood on a regular basis. Second, plaintiffs have asked me to
4 explain why Sharp Park Golf Course's pumping operations have not been able to prevent
5 flooding. Third, plaintiffs asked me to determine if Sharp Park's pumping operations cause
6 water levels to recede below elevations that California red-legged frog egg masses have been
7 laid in the past. Fourth, plaintiffs asked me to determine the water levels that must be retained at
8 Sharp Park to ensure that known California red-legged frog breeding areas remain
9 hydrologically connected to the Laguna Salada wetland complex for six weeks, presuming no
10 further water inputs occur during the six-week period. Fifth, plaintiffs asked me to compare
11 typical flooding events at Sharp Park to the water levels at which I determine are necessary to
12 keep known frog breeding areas hydrologically connected to Laguna Salada for six weeks.
13 Finally, plaintiffs asked me to determine if ceasing pumping at Sharp Park when California red-
14 legged frog eggs and tadpoles are present will cause flooding in surrounding communities.

SHARP PARK GOLF COURSE IS UNIQUELY PRONE TO FLOODING

15 6. Sharp Park Golf Course floods in the winter on a regular basis. It is especially prone to
16 flooding because of the Golf Course's location within its watershed, the sea wall which blocks
17 natural freshwater outflow from Sanchez Creek, and other factors that ensure that large portions
18 of the golf course remain under water for several days in all but the driest years. This is true
19 even when Sharp Park's pumps are in full operation.

20 7. Flooding is a chronic and persistent issue at Sharp Park. Historically, Sharp Park has
21 experienced severe flooding due to intense storm runoff and sea wall overtopping in April 1958,
22 January 1978 and January 1983 (Geomatrix, 1987; FEMA, 1987).

23 8. Flooding continues to be persistent in modern times. For example, flooding of the golf
24 course is reported in the Horse Stable Pond pump house log on February 20, 2011. Many of the
25 log's gauge recordings indicate that even when the Horse Stable Pond pumps are in full
26 operation, water levels reach between 9- and 10-feet in elevation (NAVD88) every year (2007

1 through 2011). Based on review of the available site topographic map (Lee, Inc., 2008) and the
2 inundation map presented in the Vandivere declaration, water levels above 9-foot NAVD88
3 extend well into the western margins of the golf course. Water levels may reach up to 10-12
4 NAVD 88 in response to large storm events (see Ex. B, Figure 12).

5 **PUMPING HAS NOT PREVENTED FLOODING AT SHARP PARK**

6 9. The golf course attempts to drain Sharp Park using two pumps stationed at Horse Stable
7 Pond, one referred to as the large pump and the second referred to as the small pump. The
8 maximum discharge rates for these pumps are designed for approximately 10,000 gallons per
9 minute (gpm) and 1,500 gpm. I have reviewed the Pump house log book and the deposition
10 transcript of pump house stationary engineer John Ascariz, and although the pumps expel
11 massive amounts of water from Sharp Park, the golf course continues to flood.

12 10. In order to translate the staff gauge readings from the Pump house log into water level
13 elevations consistent with the Lee, Inc. 2008 topographic maps (NAVD88 datum), the Horse
14 Stable Pond staff gauge recordings in the Pump house log were converted to the NAVD88
15 datum elevations by adding 5.9-feet to staff gauge measurements. This conversion was derived
16 by comparing Pump house log staff gauge recordings to our continuous Pond water level
17 measurements collected in 2008 and 2009. Our continuous water level record was tied to the
18 NAVD88 vertical datum through an elevation survey of an associated pond staff plate installed
19 and monitored at our recording instrument. Ex. D presents a plot of the converted Pump house
20 log water level recordings versus our 2008/09 continuous Pond water level recordings, and
21 these data are in close agreement. The continuous water level record for the December 13, 2008
22 through February 3, 2009 period is missing due to instrument error over this period.

23 11. In order to compare Horse Stable Pond pumping rates and water levels, I converted the
24 remainder of the Pump house log gauge records to the NAVD88 datum and plotted concurrent
25 water levels and cumulative pumped volumes from Horse Stable Pond during the past four
26 winters (2007/08, 2008/09, 2009/10 and 2010/11). This graph is provided as Ex. E. The
27 diamonds plotted on Ex. E represent Pump house log water elevations in feet NAVD88. The
28 cumulative large, small and combined (large +small) pump water volumes for each individual

1 winter period are also plotted as the multi-colored lines on Exhibit E. Rising water levels and
2 cumulative pump volumes indicate periods of increased surface runoff to the Laguna and Pond
3 in response to winter rain storms. The cumulative total pumped water over any given winter
4 reflects the total amount of runoff entering the project area. For example, the lesser cumulative
5 pump volume during the winter of 2008/09 as compared to the volume pumped during the
6 winter of 2010/2011 indicates 2008/09 was a noticeably drier year than 2010/11. As indicated
7 above, flooding of the golf course occurs between 8- and 9-feet in elevation, and water levels
8 during each winter monitored between 2007 and 2011 exceed this level. This lead to extensive
9 flooding onto Sharp Park Golf Course.

10 12. Only when winter rains slow or cease can floodwaters at Sharp Park be pumped faster
11 than the rains fall. Indeed, based on my own records and the Sharp Park Pump house log, it is
12 apparent that the pumps often must operate for hours or even days after rain events to drain
13 water from Sharp Park.

14 **PUMPING OPERATIONS CAUSE EGG MASS STRANDINGS AT SHARP PARK**

15 13. While pumping has limited utility in preventing Sharp Park Golf Course from flooding,
16 it has caused California red-legged frog egg masses to strand and desiccate.

17 14. I have reviewed the Recreation and Park Department's maps of California red-legged
18 frog egg-mass locations at Sharp Park for the past several winters. Based on these maps it is
19 apparent that the vast majority of California red-legged frog egg masses have been laid in the
20 same general areas at Sharp Park. Frogs have breed in these areas under a variety of winter rain
21 conditions, during dry winters (2008/09) to wet years (2010/11).

22 15. I have also reviewed elevation data for Sharp Park's lagoon, pond and golf course. At 8-
23 feet in elevation, Figure 1 of Exhibit 2 of the Vandivere declaration depicts all of Laguna
24 Salada—including the areas that are considered "isolated" when water levels fall below 7-feet in
25 elevation—as one large, contiguous, hydrologically connected water body. By comparing the
26 egg mass locations to the elevation data, the elevation of these breeding areas can be ascertained
27 and compared to water levels at Sharp Park. Based on my review of available maps indicating
28 egg mass observation in 2003 through 2011, the vast majority of egg masses were located at

1 elevations between 7.0- and 8.0-feet NAVD88. (Ex. F). Historically, pumping operations have
2 caused these egg masses to strand, as pumping lowers the water level below this elevation range
3 (Ex. E).

4 16. It is also my professional opinion that pumping operations at Horse Stable Pond have
5 caused egg masses to become stranded and desiccated at Sharp Park over the past four years in
6 response to storm water pumping. This occurs when pond water levels rise rapidly in response
7 to storm events and increased runoff that out-paces the ability of the pumps to maintain a
8 constant pond water level. As the storm passes and runoff recedes, pond water levels drop
9 rapidly as pumps draw the pond back down to a pre-set level. In order to minimize rapid
10 cycling of the pumps on/off, a common practice is to set the pump to turn on at a predetermined
11 water level and then to turn off at a lower predetermined level. For example, the Pump house
12 log for January 31, 2008 indicates that a pump "on" level is set at a gauge height of 3.9 and
13 pump "off" at 3.3. During these water level fluctuations, frogs will lay eggs during the high
14 stand in water level and eggs become stranded above the water when levels are drawn down by
15 pumping. Based on a comparison of egg mass monitoring notes and Pump house log entries, an
16 example of this type of egg stranding occurred during a storm on or around February 20, 2011.
17 For the week prior to the storm on the 20th, pond water levels were maintained around an
18 elevation of 8.4-feet. In response to the increased storm runoff outpacing the pumps, water
19 levels rose almost a foot to 9.3-feet. Within two or three days after the storm, water levels were
20 pumped back down to 8.4-feet where they remained for several weeks. This stranding event
21 was opportunistically observed by plaintiffs' members. See Docket No. 60-2, Ex. 4; 60-7, Ex.

22 26. An egg mass was discovered at risk on February 21, Docket No. 60-2, Ex. 4, and then
23 stranded on February 22 through February 24, *id.*; Docket No. 60-7, Ex. 26, which could only
24 have occurred if the frogs laid their eggs during the short highstand associated with storm
25 flooding and subsequent dewatering.

26 17. Over the past four winters, notes in the Pump house log have indicated an increased
27 effort to reduce impacts to frog egg masses. As a result, there has been an increased frequency
28 in visits (as determined by increased frequency in Pump house log entries) to monitor and adjust

1 pumping levels, which has progressively reduced the variability in the range of pond water
2 levels between 2007 and 2011 (see Ex. E). However, there continue to be periods of higher
3 water levels followed by rapid drawdown by pumping, which lead to egg stranding events such
4 as the one described for the February 20, 2011 storm event above.

5 18. It is not likely that strandings are caused by shallow depressions in Sharp Park's
6 landscape independent of the golf course pumping operations. Based on Defendants' shaded
7 relief map presented as Figure 1 of Exhibit 2 of the Vandivere declaration, Docket No. 66-2,
8 isolated pond areas only occur when water levels drop below approximately 8-feet in elevation.
9 Historically, pumping operations targeted maintaining water levels below 8-feet in elevation
10 (see Ex. E). However, over the winter of 2010/11, water levels reached and were maintained
11 above 8-feet in elevation for long periods. This was made possible due to the constant and
12 extended period of rainfall and runoff that supplied the pond through the winter and spring
13 months. The result of this extended surface water runoff supply, combined with the pumping of
14 the pond down to only an elevation around 8.4-feet, allowed the known frog egg mass breeding
15 areas between 7- 8-feet to remain hydrologically connected to the Laguna Salada wetland
16 complex for long periods of time, significantly reducing, if not eliminating, the opportunity for
17 stranding and desiccation of eggs laid at or below 8-feet in elevation. Although water levels at
18 Sharp Park remained high enough to keep the Laguna Salada complex hydrologically connected
19 during the 2010/11 winter, the City's rapid drawdown of the complex immediately after the
20 February 20, 2001 storm caused an egg mass to strand.

21 19. Historically, runoff to the pond did not last as late into the season as it did the winter of
22 2010/11. In addition, historic pumping durations were shorter and the decline in pond water
23 levels was more rapid and occurred much earlier in the year (Exhibit E), leading to water levels
24 falling below 8-feet in elevation. Moreover, wet years like 2010/11 are unique and not a normal
25 or predictable occurrence. This winter, for example, has been fairly dry until recently. The low
26 rainfall should caution the City to be judicious in its pumping operations to ensure that egg
27 masses are not stranded between 7- and 8-feet, as they have been in many previous years.

1 20. However, I have reviewed photographs of the Sharp Park Pump gauge taken on January
2 18, 2012 that indicate the City recently drained Horse Stable Pond to 7.1 feet NAVD in
3 anticipation of upcoming storms. If egg masses are laid during the storm's highstand and water
4 levels subsequently fall back to 7.1 feet NAVD, there is a high probability that stranding events
5 will occur.

6 21. It is my opinion that a reasonable and conservative approach towards protecting frog
7 eggs from stranding and desiccation is to initiate a pumping and pond management strategy that
8 maintains egg inundation for a sufficient length of time at locations and elevations where frogs
9 have repeatedly laid eggs. As indicated above, the majority of historic egg masses observed
10 stranded or relocated were found at elevations between 7.0- and 8.0-feet NAVD88. Sustaining
11 viable egg masses at an elevation of 8-feet requires a sufficient supply of water to keep them
12 inundated for a reasonable duration of time. Since surface water runoff is an unpredictable
13 supply, which is further complicated by dewatering by pumps, it seems prudent to provide a
14 sufficient level of ponded water above the 8-foot elevation so that even with no further surface
15 runoff into the Laguna/Pond system, egg masses at or below 8-feet in elevation would remain
16 inundated. Such a scenario and water level would not be lowered by pumping and would need
17 to account for losses and declines associated with evaporation, seepage and subsurface outflow.

18 **WATER LEVELS MUST REMAIN AT 10.2- FEET NAVD88 OR HIGHER IN ORDER**
19 **TO PREVENT STRANDING OF EGG MASSES AT SHARP PARK**

20 22. It is my understanding that a conservative estimate of the duration needed for California
21 red-legged frog egg-masses to hatch and tadpoles to become strong enough to swim to deeper
22 waters in cool climates like Pacifica is approximately 6 weeks. (BSA/PWA 2011, Appendix C,
23 Table 1).

24 23. To determine the water level needed to ensure hydrologic connection and six weeks of
25 saturation in the portions of Sharp Park where California red-legged frogs have traditionally laid
26 eggs (generally areas with elevations between 7- and 8-feet NAVD88), I've completed a simple
27 pond recession analysis (spreadsheet model) similar to the groundwater seepage computation
28

1 presented in Vandivere's declaration. However, my analysis was improved in several ways,
2 providing more accurate information.

3 24. First, after reviewing the Vandivere declaration, I realized that his calculation contained
4 a conversion error. Lines 9-10 on page 6 indicates the upper elevation of the seepage face at
5 the edge of the Pacific Ocean is 6-ft NAVD88. But Figure 4 of Exhibit 5 of Vandivere's
6 declaration indicates this elevation at 6-ft NGVD29 – a different measurement unit that has a
7 2.1-foot conversion factor. This inconsistency leads to an incorrect hydraulic gradient (i)
8 calculation. This error is corrected in my seepage computations, yielding a steeper initial
9 gradient (0.0126 ft/ft when the Laguna water level is 12-ft NAVD88) along the seepage front
10 and higher groundwater outflow rates.

11 25. Second, Vandivere uses a hydraulic conductivity (K) value of 10,000 gallons per day per
12 ft² (gpd/ft²) for the assumed homogeneous and clean beach sands that groundwater seeps
13 through under the western levee. This value is biased towards the highest K-values published
14 for sand. Ex. G presents published ranges for K as reported from a number of different
15 publications related to groundwater flow hydraulics. For purposes of my pond recession
16 analysis, the 10,000 gpd/ft² rate was used but it should be recognized that a more conservative
17 or median value would yield much slower seepage rates causing a longer recession in ponded
18 water levels after flooding.

19 26. Third, Vandivere's analysis only considers groundwater outflow, yet there is a
20 significant component of groundwater inflow to Laguna Salada wetland as documented in our
21 report, Ex. B, p. 7, and the PWA 1992 report. In order to account for this groundwater inflow,
22 we assume the following: a constant hydraulic gradient (i) of 0.0058 ft/ft (calculated from
23 seasonal groundwater elevations presented on Figure 24 of the PWA 1992 report; a constant
24 saturated area of 12,000 ft² (saturated aquifer thickness of 6-feet and seepage front of 2000
25 linear feet); and initial hydraulic conductivity of 100 gpd/ft² for the upgradient "medium
26 grained sand" aquifer as reported on Figure 22 of PWA's 1992 report (see Ex. H).

27 27. By incorporating known groundwater inflows into the model and fixing the conversion
28 error, it is my professional judgment that my pond recession analysis is more accurate than

1 those presented by Defendants in this matter. Furthermore, because I use the same (K) rate as
2 Defendants' experts—which as explained above is biased towards the highest rates published in
3 the relevant literature—it is likely that the model creates conservative estimates.

4 28. The analysis assumes an initial Laguna Salada water level of 10.2-feet. The results of the
5 pond recession analysis are presented in Ex. I and include: daily Laguna volumes and ponded
6 surface areas; ending daily Laguna water levels; and ponded volume and area after accounting
7 for seepage losses/gains. The hydraulic gradient and saturated thickness of the seepage front
8 are recalculated each day based on the adjusted water volumes and associated water surface
9 elevation. Seepage calculations were performed for a 365-day period. Ex. J presents the water
10 level-volume-surface area relationships used to translate between Laguna water level, volume
11 and surface area. These values were calculated from the project topographic map completed by
12 Lee, Inc. for Tetra Tech, Inc. as part of the Sharp Park Conceptual Restoration Alternatives
13 Report (Tetra Tech, 2009). The groundwater seepage model is validated to some extent by the
14 equilibration of the late season Laguna water levels at an elevation between 6.0- and 6.5-feet,
15 the approximate static pond level observed during PWA's monitoring in 1990-91 and KHE's
16 monitoring in 2008.

17 29. Ex. K presents the recession analysis results as a plot of changing water surface
18 elevation and ponded area versus days since the water level reached 10.2-foot NAVD 88 at
19 Sharp Park. This analysis targets providing 6-weeks of inundation to eggs at or below 8-feet in
20 elevation and assumes no further inflows or pumping after the peak rain event. Highlights of
21 these results include:

- 22 • Day 1 flooding to an elevation of 10.2-feet yields 40-acres of ponded area;
- 23 • Ponding recedes to 9-feet and 32-acres after 18 days;
- 24 • Ponding recedes to 8.0-feet and 26-acres after 42 days (6 weeks);
- 25 • Ponding recedes to 7.0-feet and 19-acres after 103 days;
- 26 • Ponding recedes to 6.5-feet and 15-acres after 217 days.

27 30. These results indicate that ceasing pumping after attaining a water level elevation of
28 10.2-foot NAVD 88 would allow eggs and tadpoles at 8-feet in elevation to remain submerged

1 in waters hydrologically connected to the deeper areas of Laguna Salada for more than six
2 weeks, even if no further rain or other water inputs are provided.

3 **THE NECESSARY WATER LEVELS ARE SIMILAR TO WATER LEVELS THAT**
4 **OCCUR AT SHARP PARK ON A REGULAR BASIS**

5 31. An inundation level of 10.2-feet is not out of the ordinary at Sharp Park. Based on the
6 historic pumping volumes recorded in the Pump house log, there is sufficient surface water
7 supply to reach this level during all but critically dry years as long as pumping is reduced or
8 temporarily curtailed. The Pump house log indicates water levels have reached between 9- and
9 10-feet in elevation over the past four winters even with operational pumping. Hydraulic
10 modeling of a pond with a starting water level of 6.8-feet under maximum pumping conditions
11 would be flooded to the 10.2-foot elevation during a storm having a recurrence interval between
12 2- and 5-years (Figure 10 of Ex. B). Much smaller winter storms lead to more frequent flooding
13 to 10.2-feet when the pond level starts at an elevation of 8-feet NAVD88. The main difference
14 in providing ponding relief to frog eggs would be the duration of ponding between 8- and 10.2-
15 feet; currently water is pumped down from this level whereas ponding would be sustained
16 above 8-feet for a minimum of 6-weeks under the frog egg relief scenario.

17 **MAINTAINING WATER LEVELS THAT DO NOT STRAND RED-LEGGED FROG**
18 **EGG MASSES WILL CREATE NO FURTHER APPRECIABLE FLOOD RISK ON**
19 **THE SURROUNDING COMMUNITY**

20 32. It is my professional opinion that a water level at or below 10.2-foot NAVD 88 can be
21 maintained in Sharp Park without pumping water from Horse Stable Pond.

22 33. In the event water levels exceed 10.2-feet, mobile pumps can be used along Clarendon
23 Road and Lakeside Avenue (near the Northeast Corner of Sharp Park's western unit) to pump
24 water from Sharp Park. Mobile centrifugal pumps that can provide relief from flooding are
25 readily available for purchase or rent in the Bay Area. It is my understanding that mobile
26 pumps are already used in this area during heavy winter rains, see Ex. L, when waters already
27 extend beyond the Sharp Park boundaries.

28 34. Consequently, it is my professional opinion that there is relatively low incremental
increase in existing flood hazards beyond the boundaries of Sharp Park this winter associated

1 with cessation of pumping of water from Horse Stable Pond and implementation of adequate
2 mobile pumping along Clarendon Road and Lakeside Avenue (near the Northeast Corner of
3 Sharp Park's western unit).

4 CONCLUSION

5 35. Even with pumps operating at full capacity, Sharp Park golf course floods on an annual
6 basis. Rapid changes in pond water levels are a byproduct of current pump operations, even
7 under diligent monitoring and maintenance. In turn, rapid changes in pond levels, especially
8 those that accompany winter storms, lead to egg stranding and desiccation. Holding pond levels
9 at or above 8.0-feet in elevation would maintain saturated conditions in segregated depressions
10 and shallow channels for a period of six weeks along the margins of Laguna Salada, common
11 areas where frog like to lay eggs. An inundation level of 10.2-feet after eggs are laid would
12 provide a minimum six weeks of incubation and hatching for eggs laid at an elevation of 8-feet
13 or less even if no further rain inputs occur after eggs are laid. Maintaining ponding above 8-feet
14 is also important to maintain connectivity for tadpoles between shallow channels and
15 depressions and the main Laguna water body. Any increased flood hazards associated with
16 reducing the floodwater storage capacity of the project area (by maintaining a 10.2-foot
17 elevation) can be mitigated through the use of mobile pumps.

18
19
20
21 01/20/12
Date


Greg Kamman

EXHIBIT A

Greg Kamman, PG, CHG

Principal Hydrologist



EDUCATION	1989	M.S. Geology - Sedimentology and Hydrogeology Miami University, Oxford, OH
	1985	A.B. Geology Miami University, Oxford, OH
REGISTRATION	No. 360 No. 5737	Certified Hydrogeologist (CHG), CA Professional Geologist (PG), CA
PROFESSIONAL HISTORY	1997 - Present	Principal Hydrologist/Vice President Kamman Hydrology & Engineering, Inc. San Rafael, CA
	1994 - 1997	Senior Hydrologist/Vice President Balance Hydrologics, Inc., Berkeley, CA
	1991 - 1994	Project Geologist/Hydrogeologist Geomatrix Consultants, Inc., San Francisco, CA
	1989 - 1991	Senior Staff Geologist/Hydrogeologist Environ International Corporation, Princeton, NJ
	1986 - 1989	Instructor and Research/Teaching Assistant Miami University, Oxford, OH

SKILLS AND EXPERIENCE

As a hydrologist with over twenty years of technical and consulting experience in the fields of geology, hydrology, and hydrogeology, Mr. Kamman routinely manages projects in the areas of surface- and ground-water hydrology, stream and wetland habitat restoration, water supply, water quality assessments, water resources management, and geomorphology. Areas of expertise include: stream and wetland habitat restoration; characterizing and modeling basin-scale hydrologic and geologic processes; assessing hydraulic and geomorphic responses to land-use changes in watersheds and causes of stream channel instability; evaluating surface- and ground-water resources and their interaction; and designing and implementing field investigations characterizing surface and subsurface conditions. In addition, Mr. Kamman commonly works on projects that revolve around sensitive fishery, wetland, animal and/or riparian habitat issues and problems. Thus, Mr. Kamman is accustomed to working within a multi-disciplined team and maintains close collaborative relationships with biologists, engineers, planners, architects, lawyers, and various agency staff.

PROFESSIONAL SOCIETIES & AFFILIATIONS

American Geological Institute
Society for Ecological Restoration International
California Native Plant Society

REPORTS AND PUBLICATIONS

- Kamman, G.R., 2011, Mana Plain Wetland Area Hydraulic Model Report, Kauai, Hawaii. Prepared for: Mana Plain Wetland Restoration Partnership, September 10, 87p.
- Kamman, G.R. and Lapine, S., 2011, Erosion control assessment in support of trail planning at Mori Point, Pacifica, CA. Prepared for Golden Gate Parks Conservancy, September 2, 55p.
- Kamman, G.R., Kamman, R.Z., Lapine, S., and Higgins, S., 2011, Draft Basis of Design Report, Volume 1, Salt River Ecosystem Restoration Project, Riverside Ranch Tidal Marsh Restoration and Preliminary Salt River Channel Design. Prepared for: Humboldt County RCD, June.
- Kamman, G.R., 2011, Chapter 3.1: Hydrology and Water Quality and Chapter 3.2: Geology and Soils, in: Grassetti Environmental Consulting, California State Coastal Conservancy, and Kamman Hydrology & Engineering, Inc., 2011, Final Environmental Impact Report: Salt River Ecosystem Restoration Project (SCH# SD2007-05-6). Prepared for Humboldt County RCD, February, 744p.
- Kamman, G.R., Higgins, S. and Lapine, S., 2011, 2nd DRAFT Restoration Feasibility and Conceptual Design Report, Third Valley Creek and Chicken Ranch Beach, Inverness, California. Prepared for: Tomales Bay Watershed Council, with contributions from May & Associates, Inc., Avocet Research Associates, and Anthropological Studies Center of Sonoma State University, April 20, 199p.
- Kamman, R.Z., Kamman G.K., and Higgins, S., 2011, Annual geomorphic monitoring report for Water Year 2010, Vineyard Creek Channel Enhancement Project. Prepared for Marin County Department of Public Works, Flood Control and Water Conservation District, February, 47p.
- Kamman, G.R. and Lapine, S., 2010, Nyhan Creek Trail Segment Assessment, Southern Marin County, California. Prepared for Golden Gate National Parks Conservancy, December 31, 23p.
- Kamman, G.R., 2010, Chapter 3.1: Water Resources. In: The Presidio Trust (eds.), 2010. *The Quartermaster Reach Environmental Assessment*, September 21, pp. 11-25.
- Kamman, G.R. and Higgins, S., 2010, Hydrologic and Water Quality Investigation, Lower Pitkin Marsh, Sonoma County, California. Prepared for Sonoma Land Trust, August 25, 69p.
- Kamman, G.R., 2010. Subsurface Investigation & Conceptual Wetland Enhancement at North Fort Scott Wetland Mitigation Site, The Presidio of San Francisco, California. Prepared for The Presidio Trust, August 6, 43p.
- Kamman, G.R. and Lapine, S., 2010, Yreka Creek Hydrologic and Hydraulic Analysis Report, Siskiyou County, California. Prepared for WRA, Inc. and the City of Yreka, Department of Public Works, July 29, 32p.
- Kamman, G.R. and Higgins, S., 2010, Western Stege Marsh Restoration Project, Year 5 Hydrologic Monitoring Report. Prepared for Tetra Tech EM Inc. and University of California, Berkeley, July 14, 76p.
- Higgins, S. and Kamman, G.R., 2010, Watershed-based assessment of hydrologic and geomorphic conditions in Cache Creek through Capay Valley, Yolo County, CA. Prepared for Yolo County RCD, May 19, 85p.
- Kamman, G.R. and Lapine, S., 2010, Seasonal Crossing Structure Concept Design. Prepared for: George Salvaggio (WRA, Inc) and Jeanette Hook (City of Yreka), May 4, 7p.
- Kamman, G.R., 2010, Banducci Reservoir Disposal Site Design, Muir Beach Project. Prepared for Carolyn Shoulders (GGNRA, NPS) and Sharon Farrell (GGNPC), April 5, 4p.
- Kamman, G.R., 2010, Letter Report Regarding Feasibility to Divert Water from Arroyo Valle Seasonal Wetland Enhancement Design Concepts Shadow Cliffs Regional Recreation Area, Livermore, CA. Prepared for Anne Rivoire, Park Planner, EBRPD. January 14, 13p.

Kamman, R.Z., Kamman G.K., and Higgins, S., 2009, Annual geomorphic monitoring report for Water Year 2009, Vineyard Creek Channel Enhancement Project. Prepared for Marin County Department of Public Works, Flood Control and Water Conservation District, December 18, 33p.

Kamman, G.R. and Lapine, S., 2009, Break-Away Bridge Options and Limitations. Prepared for George Salvaggio (WRA, Inc) and Jeannette Hook (City of Yreka), December 7, 7p.

Higgins, S. and Kamman, G.R., 2009, Annual geomorphic monitoring of San Francisquito Creek channel, Sand Hill Road Bridge and former golf cart crossing, Stanford University, Santa Clara County, CA. Prepared for Stanford University, Facilities Operations - Utilities Division, December 1, 13p.

Kamman, G.R., (ed), 2009, Phase 2 Technical Report, Sycamore Grove Recovery Program, Sycamore Grove Park, Livermore, CA. Prepared for Livermore Area Recreation and Park District and Zone 7 Water Agency, Contributing Authors: HortScience, Inc., Kamman Hydrology & Engineering, Inc., Lone Pine Research and National Forest Genetic Electrophoresis Laboratory, December, 129p.

Kamman, G.R., 2009, Sharp Park Conceptual Restoration Alternatives Report-Review. Prepared for: Sharon Farrell (Golden Gate Parks Conservancy), Daphne Hatch (Golden Gate National Recreation Area), Phil Ginsburg (S.F. Recreation Park Commission), November 18, 3p.

Kamman, G.R. and Higgins, S., 2009, Fitzgerald Marine Reserve Trail Improvement: Hydrologic and Hydraulic Analysis, San Mateo County, California. Prepared for WRA, Inc., November, 22p.

Kamman, G.R., 2009, Opportunities and Constraints for Ecological Restoration Shadow Cliffs Regional Recreation Area. Prepared for: George Salvaggio (WRA) to Anne Rivoire, EBRPD, September 23, 13p.

Higgins, S. and Kamman, G.R., 2009, Preliminary Hydrologic Assessment Report for the Borba Dairy Farms Conservation and Wetland Mitigation Bank Merced County, California. Prepared for WRA, Inc., September 14, 40p.

Kamman, R.Z., Higgins, S. and Kamman, G., 2009, Olema Marsh Restoration: Salinity Impact Assessment Report. Prepared for: Point Reyes National Seashore Association and National Park Service, September, 58p.

Kamman, G.R. and Higgins, S., 2009, Western Stege Marsh Restoration Project, Year 4 Hydrologic Monitoring Report. Prepared for Tetra Tech EM Inc. and University of California, Berkeley, June 30, 37p.

Kamman, G.R. and Williams, T., 2009, Hydrologic monitoring results and implication on modification to Middle Pond, Mori Point. Prepared for Golden Gate Parks Conservancy, May 28, 8p.

Kamman, G.R. and Lapine, S., 2009, Yreka Creek Floodplain Enhancement Assessment. Prepared for: George Salvaggio (WRA, Inc) and Jeannette Hook (City of Yreka), May 27, 10p.

Kamman, G.R. and Higgins, S., 2009, Preliminary Findings of a Geomorphic Assessment in Support of Erosion Control Planning and Design; Phleger Estate, San Mateo County, California. Prepared for Golden Gate National Parks Conservancy and Golden Gate National Recreation Area, NPS, April 28, 6p.

Kamman, G.R. and Higgins, S., 2009, Report for the Hydrologic Assessment and Ecological Enhancement Feasibility Study, Laguna Salada Wetland System, Pacifica, California. Prepared for: Tetra Tech Inc., San Francisco, March 30, 45p.

Kamman, G.R., 2009, Annual geomorphic monitoring of San Francisquito Creek channel, Sand Hill Road Bridge and former golf cart crossing, Stanford University, Santa Clara County, CA. Prepared for Stanford University, Facilities Operations - Utilities Division, February 18, 62p.

Kamman, G.K. and Higgins, S., 2008, Annual hydrologic/geomorphic monitoring, Vaquero Farms wetlands mitigation, Vineyards at Marsh Creek (Blackhawk 4)/EDAW Project No. 07015005.01. Prepared for EDAW Natural Resources (Sacramento), December 19, 20p.

Lapine, S. and Kamman, G.R., 2008, Hydrologic and Hydraulic Analysis, Saenger Property. Prepared for Paul Saenger, December 7, 5p.

Lapine, S. and Kamman, G.R., 2008, Lower West Creek drainage improvement assessment. Prepared for Marin County Department of Public Works, Flood Control, November 5, 4p.

November 3, 2008. Memorandum from KHE to Mark Frey; Subject: NIKE Swale/Landfill 8 Shallow Subsurface Investigation.

Kamman, G.R., 2008, Reduced Flooding Pressure Resulting from Proposed Greenway Project. Prepared for Jeannette Hook (City of Yreka), August 26, 11p.

Kamman, G.R., 2008, Technical Assistance in Development of Year 3 Monitoring Report. Prepared for: Jason Brodersen, P.G., Program Manager, Tetra Tech EM Inc., August 20, 11p.

Kamman, R., Kamman, G.R., Higgins, S., and May, L., 2008, Summary of Headland Institute (HI) Stream Corridor Enhancement Design Components. Prepared for: The Headlands Institute Restoration Design Team, May 28, 36p.

Kamman, R., Kamman, G.R., Higgins, S., and May, L., 2008, Summary of Site Conditions for the Headland Institute (HI) Stream Corridor and Watershed. Prepared for: The Headlands Institute Restoration Design Team, May 5, 37p.

Kamman, G.R., 2008, Annual geomorphic monitoring of San Francisquito Creek channel, Sand Hill Road Bridge and former golf cart crossing, Stanford University, Santa Clara County, CA. Prepared for Olberding Environmental Inc., January 30, 37p.

Kamman, G.K. and Higgins, S., 2007, Annual hydrologic/geomorphic monitoring, Vaquero Farms wetlands mitigation, Vineyards at Marsh Creek (Blackhawk 4)/EDAW Project No. 07015005.01. Prepared for EDAW Natural Resources (Sacramento), December 17, 17p.

Kamman, G.R., 2007, Independent Model Review for Klamath Settlement Negotiations Klamath Independent Review Project (KIRP). Prepared for Erica Terrence and Anna Schulz, Northcoast Environmental Center, November 9, 19p.

Kamman, G.R., and Higgins, S., 2007, Results of subsurface investigation: Dragon Fly Creek. Prepared for The Presidio Trust, November 9, 12p.

Kamman, G.R., 2007, Chapter 3: Alternatives and Chapter 4.3: Water Resources, in: The Presidio Trust, 2007, Environmental Assessment for Tennessee Hollow Upper Watershed Revitalization Project, August, 149p.

Kamman, G.R., 2007, Mori Point trail planning and restoration project, wetland pond final designs. Prepared for Golden Gate Parks Conservancy, July 23, 34p.

Kamman, G.R., 2007, Chapter 2: Hydrological Considerations in: Nautilus Environmental (eds), Brown & Caldwell, Foothill Associates, KHE, and Stoecker Ecological, 2007, Feasibility Study on the Reuse of Ojai Valley Sanitary District Effluent - DRAFT Final Facilities Planning Report, prepared for City of Buenaventura, Public Works Department, July 10, 148p.

Kamman, G.R., 2007, Mori Point wetland ponds - preliminary designs. Prepared for Golden Gate Parks Conservancy, June 19, 6p.

Kamman, G.R., and Higgins, S., 2007, Santa Clara River Estuary water budget and salinity assessment. Prepared for Nautilus Environmental LLC and The City of Buenaventura, April 30, 11p.

Kamman, G.R. and Kamman R.Z., 2007, Feasibility and design report of Bear Valley Creek watershed enhancement and fishery restoration project. Prepared for Point Reyes National Seashore Association and National Park Service, March, 325p.

Kamman, G.R., Kamman R.Z., and Beahan, C., 2007, Design report for lower Redwood Creek floodplain and salmonid habitat restoration at the Banducci site, Golden Gate National Recreation Area, Marin County, CA. Prepared for Golden Gate Parks Conservancy and National Park Service, February 28, 105p.

Kamman, G.R., 2007, Pilarcitos Creek Bank Stabilization Project, Pilarcitos Creek, San Mateo County, California. Prepared for TRC-Essex, January 22, 8p.

Kamman, G.R., 2007, Annual geomorphic monitoring of San Francisquito Creek channel, Sand Hill Road Bridge and former golf cart crossing, Stanford University, Santa Clara County, CA. Prepared for Olberding Environmental Inc., January 2, 29p.

Kamman, G.R. and Beahan, C., 2006, Annual geomorphic monitoring of Arroyo Mocho channel - WY2006, Wente Street Bridge, Livermore, CA. Prepared for Sycamore Associates, LLC, December 14, 13p.

Kamman, G.K. and Higgins, S., 2007, Hydraulic analysis for final design, Vaquero Farms Wetland Mitigation Project. Prepared for Sycamore Associates, LLC, July 11, 8p.

Kamman, G.R. and Lapine, S., 2006, West Creek drainage improvement assessment, Tiburon, CA. Prepared for Marin County Department of Public Works, Flood Control and Water Conservation District, July, 44p.

Kamman G.K. and Kamman, R.Z., 2006, Larkspur Creek bank stabilization, floodplain expansion and riparian revegetation project, Schaefer Parcel (Lark Creek Inn - parcel no. 021-104-34. Prepared for Department of Public Works, City of Larkspur, CA, June 1, 11p.

Kamman, G.R., 2006, Hydrologic Feasibility Assessment Report for the Tennessee Hollow Watershed Project, The Presidio of San Francisco. Prepared for: The Presidio Trust, with assistance from Colby Groundwater Consulting, May, 52p.

Kamman, G.R., 2006, Piezometer installation and monitoring Fill Site 6A, The Presidio of San Francisco. Prepared for The Presidio Trust, April 14, 20p.

Kamman, G.R., and Kamman, R.Z., 2006, Data Synthesis and Hydrodynamic Model Development Feasibility Report, Pescadero Lagoon, San Mateo County, California. Technical letter report prepared for California Coastal Commission, April 13, 18p.

Kamman, G.R., 2006, Leona Mines Closure - Conceptual Creek Design. Prepared for Peters & Ross, February 5, 15p.

Kamman, G.R. and Rios, T., 2005, Annual geomorphic monitoring of San Francisquito Creek channel, Sand Hill Road Bridge and former golf cart crossing, Stanford University, Santa Clara County, CA. Prepared for Olberding Environmental Inc., December 12, 20p.

Kamman, G.R., 2005, Preliminary hydrologic assesment, Mori Point Trail Planning and Restoration Project. Prepared for Golden Gate Parks Conservancy, October 14, 8p.

Kamman, G.R. and Rios, T., 2005, Annual geomorphic monitoring of Arroyo Mocho channel, Wente Street Bridge, Livermore, CA. Prepared for Sycamore Associates, LLC, November 11, 11p.

Kamman, G.R., 2005, Hydrology and water quality assessment report, Coastal Trail planning at Lands End, San Francisco, CA. Prepared for Golden Gate Parks Conservancy, August, 24p.

Kamman, G.R., 2005, Technical letter report - groundwater impact assesment, January 2005 Settlement Agreement, Lundy Hydroelectric Project (FERC No. 1390). Prepared for Lundy Mutual Water Company, May 6, 9p.

Kamman, G.R., Gragg, J., and Kamman R.Z., 2005, Hydrology & Coastal Lagoon Assessment: Environmental Study of the Santa Clara River Estuary. Prepared for Nautilus Environmental LLC and The City of Buenaventura, March, 52p.

Kamman, G.R. and Rios, T., 2005, Fiscalini Bank Stabilization Hydraulic Analysis and Preliminary Design Evaluation Report. Prepared for The California Coastal Conservancy and Greenspace-The

Cambria Land Trust, February, 27p.

Kamman, G.R. and Kamman R.Z., 2004, Gallinas Creek Restoration Feasibility Study and Conceptual Design Report, Marin County, California. Prepared for: San Pablo Bay Watershed Restoration Program Partners (US Army Corps of Engineers, San Francisco District and California Coastal Conservancy), in cooperation with: The Friends of Gallinas Creek., The Bay Institute, and Marin County Stormwater Pollution Prevention Program, December, 47p.

Kamman, G.R. and Rios, T., 2004, Hydrologic Feasibility Analysis for the Tolay Lake Ranch Property, Sonoma County, California. Prepared for: Sonoma County Agricultural Preservation & Open Space District, December, 96p.

Kamman, G.R. and Rios, T., 2004, Annual geomorphic monitoring of Arroyo Mocho channel, Wente Street Bridge, Livermore, CA. Prepared for Sycamore Associates, LLC, November 17, 10p.

Ecorp Consulting, Inc and Kamman Hydrology & Engineering, Inc., 2004, Draft Gualala Estuary and Lower River Enhancement Plan: Results of 2002 and 2003 Physical and Biological Surveys. Prepared for: Sotoyome Resource Conservation District and California Coastal Conservancy, June 10.

Kamman, G.R., 2003, Annual geomorphic monitoring of Arroyo Mocho channel, Wente Street Bridge, Livermore, CA. Prepared for Sycamore Associates, LLC, December 23, 10p.

Kamman, G.R., 2003, Hydrologic Analyses - Technical Letter Report, Reach B-2 Pond, Sycamore Grove Park, Livermore, CA. Prepared for Livermore Area Recreation and Parks Department, December 4, 13p.

Kamman R.Z. and Kamman, G.R., 2003, Review of flood hazard analysis for Easkoot Creek Project, Stinson Beach, CA. Prepared for Golden Gate National Recreation Area, National Park Service, September 10, 1p.

Kamman, G.R., 2003, Redwood Creek levee analysis, Lower Redwood Creek, Orick, CA. Prepared for Humboldt County Department of Public Works, July 28, 15p.

Kamman, G.R., 2003, 3rd iteration of preliminary grading plan for Fill Site 6, Tennessee Hollow Riparian Corridor Restoration Project, The Presidio of San Francisco. Prepared for The Presidio Trust, March 25, 10p.

Kamman, G.R., 2003, Draft Interim Hydrologic Monitoring Report for the Tennessee Hollow Riparian Corridor Restoration Project, The Presidio of San Francisco. Prepared for The Presidio Trust, March, 110p.

Kamman, G.R. and McBain & Trush, Inc., 2002, Chapter 4: Shallow Groundwater Hydrology. In: McBain & Trush, Inc. (eds.), 2002. *San Joaquin River Restoration Study Background Report*, prepared for Friant Water Users Authority, Lindsay, CA, and Natural Resources Defense Council, San Francisco, CA, December,

Kamman, G.R., 2002, Conceptual Watershed Model and proposed surface- and ground-water monitoring program for the Tennessee Hollow Riparian Corridor Restoration Project, The Presidio of San Francisco. Prepared for The Presidio Trust, July, 77p.

Kamman, G.R., 2001, Draft Comments: 100-year flood estimate on Upper Trinity River. Prepared for Trinity County Planning Department, February 9, 8p.

Kamman, G.R., 2002, Haypress Pond Restoration Grading Plan, Tennessee Valley, Sausalito, CA. Prepared for Golden Gate National Recreation Area, National Park Service, January 10, 15p.

Kamman, G.R., 2002, Hydraulic Assessment of Proposed Channel Modifications: Iron Horse Trail Concord, CA. Prepared for: The East Bay Regional Park District, January 2002, 12p.

PROFESSIONAL DECLARATIONS

- Kamman, G.R., 2011, Preliminary Review of BBPUD Bay Flat road Well Installation Project. Prepared for: Law Offices of Rose Zoia, July 10, 16p.
- Kamman, G.R., 2009, Finger Avenue Nine-Lot Planned Development. Professional declaration prepared for Friends of Cordilleras Creek, October 26, 2p.
- Kamman, G.R., 2007, Fairfax Conversion Project Environmental Impact Report (SCH# 2004082094). Professional declaration prepared for Friends of the Gualala River, July 27, 15p.
- Kamman, G.R., 2009, Supplemental Technical Review of Henry Cornell Winery, 245 Wappo Road, Santa Rosa, CA APN 028-260-041. Prepared for Ms. Kimberly Burr, Esquire, June 1, 3p.
- Kamman, G.R., 2008, Technical Review of Henry Cornell Winery, 245 Wappo Road, Santa Rosa, CA APN 028-260-041. Prepared for Ms. Kimberly Burr, Esquire, November 12, 8p.
- Kamman, G.R., 2007, Negative Declaration for File No. UPE04-0040, Gualala Instream. Professional declaration prepared for Friends of the Gualala River, October 21, 2p.
- Kamman, G.R., 2007, Second Declaration on WRA and Balance Hydrologics, Inc. technical studies pertaining to wetland conditions at the Harbor View Development site, Bodega Bay, CA. September 20, 3p.
- Kamman, G.R., 2007, Comments on WRA and Balance Hydrologics, Inc. technical studies pertaining to wetland conditions at the Harbor View Development site, Bodega Bay, CA. February 13, 4p.
- Kamman, G.R., 2004, Evaluation of potential impacts on hydrology and water supply, THP No. 1-04-055 SON and Proposed Mitigated Negative Declaration TCP No. 04-533, Roesler/Zapar Inc. THP/Conversion, Annapolis, CA. Professional declaration prepared for Friends of the Gualala River, August 13, 11p.
- Kamman, G.R., 2004, Evaluation of potential hydrologic effects, THP No. 1-04-059 SON and Proposed Mitigated Negative Declaration TCP No. 04-531, Sleepy Hollow (Martin) THP/Conversion, Annapolis, CA. Professional declaration prepared for Friends of the Gualala River, July 17, 9p.
- Kamman, G.R., 2004, Robert Mondavi Properties Vineyard (Erosion Control Plan Application #99323). Professional declaration prepared for the Law Offices of Thomas N. Lippe, July 1, 5p.
- Kamman, G.R., 2004, Pocket Canyon THP No. 1-020216 SON. Professional declaration prepared for Pocket Canyon Protection Group, March 8, 2p.
- Kamman, G.R., 2003, Evaluation of potential hydrologic effects, Negative Declaration for THP/Vineyard Conversion, No. 1-01-171 SON, Artesa Vineyards, Annapolis, CA. Professional declaration prepared for Friends of the Gualala River, May 19, 9p.

PROFESSIONAL PRESENTATIONS

- Higgins, S. and Kamman, G.R., 2009, Historical changes in Cache Creek, Capay Valley, CA. Poster presented at American Geophysical Union Fall Meeting 2009, Presentation No. EP21B-0602, December.
- Kamman, G.R. and Higgins, S., 2009, Use of water-salinity budget models to estimate groundwater fluxes and assess future ecological conditions in hydrologically altered coastal lagoons. Coastal and Estuarine Research Federation 20th Biennial Conference, 1-5 November, Portland, OR
- Bowen, M., Kamman, G.R., Kaye, R. and Keegan, T., 2007, Gualala River Estuary assessment and enhancement plan. Estuarine Research Federation, California Estuarine Research Society 2007 Annual Meeting, 18-20 March, Bodega Marine Lab (UC Davis), Bodega Bay, CA

Bowen, M. and Kamman, G.R., M., 2007, Salt River Estuary enhancement: enhancing the Eel River Estuary by restoring habitat and hydraulic connectivity to the Salt River. Salmonid Restoration Federation's 25th Salmonid Restoration Conference, 7-10 March, Santa Rosa, CA.

Magier, S., Baily, H., Kamman, G., and Pfeifer, D., 2005, Evaluation of ecological and hydrological conditions in the Santa Clara River Estuary with respect to discharge of treated effluent. In: Abstracts with Programs, The Society of Environmental Toxicology and Chemistry North America 26th Annual Meeting, 13-17 November, Baltimore Convention Center, Baltimore, Maryland.

Baily, H., Magier, S., Kamman, G., and Pfeifer, D., 2005, Evaluation of impacts and benefits associated with discharge of treated effluent to the Santa Clara River Estuary. In: Abstracts with Programs, The Society of Environmental Toxicology and Chemistry North America 26th Annual Meeting, 13-17 November, Baltimore Convention Center, Baltimore, Maryland.

Kamman, G.R., Kamman, R.Z., and Parsons, L., 2005, Hydrologic and Hydraulic Feasibility Assessments for Ecological Restoration: The Giacomini Wetland Restoration Project, Point Reyes National Seashore, California. In: Abstracts with Programs, The Geological Society of America, 101st Annual Cordilleran Section Meeting, Vol.37, No. 4, p. 104, Fairmont Hotel, April 29-May 1, 2005, San Jose, CA.

Kamman, G.R., 2001, Modeling and its Role in the Klamath Basin - Lewiston Reservoir Modeling. Klamath Basin Fish & Water Management Symposium, Humboldt State University, Arcata, CA, May 22-25, 2001.

DESIGNS AND SPECIFICATIONS

Kamman R.Z., Kamman G.R., and Lapine, S., 2011, Salt River Ecosystem Restoration Project, Riverside Ranch Tidal Marsh Restoration Plans, Phase 1 Construction, (90% plans). Prepared for Humboldt County RCD, December, 24 sheets.

Kamman, G.R., Kamman, R.Z., Higgins, S. and Lapine, S., 2010, Las Gallinas Valley Sanitary District (LGVSD) - Miller Creek Sanitary Sewer Easement Restoration (100% construction drawings), San Rafael, California. Prepared for LGVSD, September 1, 8 sheets.

Kamman R.Z., Kamman G.R., and Lapine, S., 2011, Draft 75% Complete Technical Specifications for the Salt River Ecosystem Restoration Project, Phase 1 (2011) Construction, Riverside Ranch and Salt River Restoration Plans. Prepared for Humboldt County RCD, February, 163p.

Kamman, G.R., Kamman, R.Z., Higgins, S. and Lapine, S., 2010, Technical Specifications for Las Gallinas Valley Sanitary District (LGVSD) - Miller Creek Sanitary Sewer Easement Restoration, San Rafael, California. Prepared for LGVSD, September 1, 70p.

Kamman, G.R., Kamman, R.Z. and Lapine, S., 2010, Point Reyes National Seashore, Restore Critical Dune Habitat to Protect Threatened and Endangered Species, 100% construction drawings. Prepared for: Point Reyes National Seashore Association and National Park Service, June 1, 13 sheets.

Kamman, G.R. and Lapine, S., 2010, Former Reservoir Fill Site, Restoration at Muir Beach, Golden Gate National Recreation Area (100% Construction drawings). Prepared for Golden Gate National Parks Conservancy, May 12, 2 sheets.

Kamman, G.R. and Lapine, S., 2010, Alluvial Fan Fill Site, Restoration at Muir Beach, Golden Gate National Recreation Area (100% Construction drawings). Prepared for Golden Gate National Parks Conservancy, May 12, 2 sheets.

Kamman, G.R., Kamman, R.Z. and Lapine, S., 2010, Technical Specifications, Point Reyes National Seashore, Restore Critical Dune Habitat to Protect Threatened and Endangered Species, 100% plan set. Prepared for: Point Reyes National Seashore Association and National Park Service, June 1, 132p.

EXHIBIT C

- Kamman G.K. and Lapine, S., 2010, Dragonfly Creek Restoration Design, in: State of California, Department of Transportation, Project plans for construction on adjacent to State Highway in the City and County of San Francisco 0.3 mile south of Route 1/101 separation, March 25, 30 sheets.
- Kamman, R.Z., Kamman G.K., and Beahan, C., 2008, 100% Design Drawings, Plans for construction of Vineyard Creek Channel Enhancement Project, from end of Arbor Circle to McClay Road, Project No. 2008-006. Prepared for Marin County Department of Public Works, Flood Control and Water Conservation District Zone 1 and City of Novato, CA, June, 28 sheets.
- Kamman G.K., Kamman, R.Z., and Beahan, C., 2008, Contract documents including: notice to contractors, proposals, special provisions and contract documents for Vineyard Creek Channel Enhancement Project, from end of Arbor Circle to McClay Road, Novato California. Prepared for Marin County Department of Public Works, Flood Control and Water Conservation District Zone 1, June, 144p.
- Kamman G.K. and Kamman, R.Z., 2008, Giacomini Wetland Restoration Project, Phase 2 (2008) Construction Drawings. Prepared for Golden Gate National Recreation Area and Point Reyes National Seashore, May, 33 sheets.
- Kamman G.K., Kamman, R.Z., and Beahan, C., 2007, Giacomini Wetland Restoration Project, Phase I (2007) Construction Drawings. Prepared for Golden Gate National Recreation Area and Point Reyes National Seashore, August, 23 sheets.
- Kamman G.K., Kamman, R.Z., and Beahan, C., 2007, Technical Specifications for Giacomini Wetland Restoration Project, Phase I (2007) Construction. Prepared for Golden Gate National Recreation Area and Point Reyes National Seashore, with contributions from Winzler & Kelly, August, 185p.
- Kamman G.K. and Kamman, R.Z., 2008, Technical Specifications for Giacomini Wetland Restoration Project, Phase 2 (2008) Construction. Prepared for Golden Gate National Recreation Area and Point Reyes National Seashore, May, 243p.
- Kamman, G.R., Kamman R.Z., and Beahan, C., 2007, 100% Specifications, Lower Redwood Creek floodplain and salmonid habitat restoration at the Banducci site, Golden Gate National Recreation Area, Marin County, CA. Prepared for Golden Gate Parks Conservancy and National Park Service, June 8, 46p.
- Kamman, R.Z., Kamman G.K., and Beahan, C., 2007, 100% Design Drawings, Lower Redwood Creek Restoration, The Banducci Site, Golden Gate National Recreation Area, Marin County, CA. Prepared for Golden Gate Parks Conservancy and National Park Service, February 28, 7 sheets.

**GREG KAMMAN EXPERT REPORT
EXHIBIT C
MATERIALS RELIED ON IN FORMING EXPERT REPORT OPINIONS**

REFERENCES

- Federal Emergency Management Agency (FEMA), 1987, Flood Insurance Study, Pacifica, California, San Mateo County, community number 060323, February 19, 30p.
- Geomatrix, 1987, Feasibility Study, Restoration of Coastal Embankment, Sharp Park Golf Course, Pacifica, CA. Prepared for: City and County of San Francisco, Department of Public Works, Bureau of Engineering, November, 91p.
- Kamman, G.R. and Higgins, S., 2009, Report for the Hydrologic Assessment and Ecological Enhancement Feasibility Study, Laguna Salada Wetland System, Pacifica, California. Prepared for: Tetra Tech Inc., San Francisco, March 30, 45p.
- Lee, Inc., 2008, Topographic survey of Laguna Salada wetlands complex. Prepared for Tetra Tech, Inc., datums NAD83 and NAVD88 (feet).
- Phillip Williams & Associates, Ltd. (PWA), Wetlands Research Associates, Inc., and Associated Consultants: Todd Steiner and John Hafernik, 1992. Draft Laguna Salada Resource Enhancement Plan. Prepared for: The City of San Francisco and the State of California Coastal Conservancy.
- PWA Conceptual Ecosystem Restoration Plan and Feasibility Assessment: Laguna Salada, Pacifica, California (BSA PWA Feb. 2011) and Appendices.
- Tetra Tech, Inc., 2009, Sharp Park Conceptual Restoration Alternatives Report: Recovery Action Planning for the San Francisco Garter Snake. Prepared for: San Francisco Recreation and Parks Department, September, 71p.

LIST OF DATA OBTAINED AND REVIEWED

Water Level Monitoring Data (available from Kamman)

Higgins, Shawn. LS Monitoring Summary, Word document, May 9, 2008.

Laguna Salada HSP water levels, Excel spreadsheet, April 4, 2008 - May 4, 2009.

Monitoring\LagunaSalada HSP water levels.xls

Memorandum to David Munro from S. Higgins and G. Kamman, Preliminary Summary of Monitoring Data from the Laguna Salada, December 12, 2008.

Stage-Storage Relationships

Terrain analysis of topographic and hydrographic survey data collected by Lee Incorporated, 2008. Area and volume measurements completed in GIS.

Rainfall

National Weather Service station at Pacifica (NWS Coop ID: 46599) (see page 11 of KHE, Inc., Report for the Hydrologic Assessment and Ecological Enhancement Feasibility Study: Laguna Salada Wetland System, Pacifica, California, March 30, 2009). This reference used to describe climate and to obtain mean annual precipitation estimate for surface water inflow calculations (see below).

November 1, 2008 rainfall event, first storm of monitoring period, 1.3 inches of rainfall. (see page 16 of KHE, Inc., Report for the Hydrologic Assessment and Ecological Enhancement Feasibility Study: Laguna Salada Wetland System, Pacifica, California, March 30, 2009). Data also from observed historical rainfall events measured at weather stations published for Pacifica, California on Weather Underground website

Design storm hydrographs used depth-duration-frequency data for San Francisco Bay region to develop 24-hour storm rainfall totals for recurrence intervals between 2- and 100-years (with base flow added as a percentage of peak flow rate). (Rantz, S.E., 1971. Precipitation Depth-Duration-Frequency Relations for the San Francisco Bay

Surface Water Flows

Mean annual runoff estimated from a percentage of mean annual precipitation (from NWS rainfall data) and based on a regional rainfall-runoff relation developed for SF Bay area (Rantz, S.E., 1974. Mean Annual Runoff in the San Francisco Bay Region, California, 1931-70., U.S. Geological Survey Miscellaneous Field Studies Map 613.)

Seasonal distribution of surface inflow is derived from mean monthly stream flow data at USGS gaging station on Pescadero Creek (St ID: 11162500) and modified to reflect lack of sustained baseflow to project site during months of low rainfall. (

see pages 11-12 of KHE, Inc., Report for the Hydrologic Assessment and Ecological Enhancement Feasibility Study: Laguna Salada Wetland System, Pacifica, California, March 30, 2009).

Hydraulic Conductivity Sources

American Society of Civil Engineers (ASCE), 1996, Hydrology handbook, second edition. ASCE Manuals and Reports on Engineering Practice No. 28, ASCE, New York, NY, 784p.

Domenico, P.A. and Schwartz, F.W., 1990, Physical and chemical hydrogeology. John Wiley & Sons, New York, NY, 824p.

Driscoll, F.G., 1986, Groundwater and wells. Johnson Screens, St. Paul, MN, 1089p.

Fetter, C.W., Jr., 1980, Applied hydrogeology. Charles E. Merrill Publishing Co., Columbus, OH, 488p.

Freeze, A.R. and Cherry, J.A., 1979, Groundwater. Prentice Hall, Inc., Upper Saddle River, NJ, 604p.

Heath, R.C., 1987, Basic ground-water hydrology. U.S. Geological Survey Water-Supply Paper 2220, 84p.

Surface Water Outflows

Excess water is drained by the pump station in Horse Stable Pond, and controlled by adjustment of probes which activate the pumps at a given water level. Water budget modeling (prior to obtaining pump log) assumed that the pumping station maintained water levels at 6.9 feet NAVD88 at the beginning of winter; water level is adjusted in February to maintain water levels at 7.3 feet.

(see page 12 of KHE, Inc., Report for the Hydrologic Assessment and Ecological Enhancement Feasibility Study: Laguna Salada Wetland System, Pacifica, California, March 30, 2009)

Pump probe settings provided by Sean Sweeney in email communication on 11/4/2008. (Table 4, page 27 of KHE, Inc., Report for the Hydrologic Assessment and Ecological Enhancement Feasibility Study: Laguna Salada Wetland System, Pacifica, California, March 30, 2009).

Annotated Pump house log

Evapotranspiration and Groundwater

Both discussed in (page 13 of KHE, Inc., Report for the Hydrologic Assessment and Ecological Enhancement Feasibility Study: Laguna Salada Wetland System, Pacifica, California, March 30, 2009).

Water Quality Data

Salinity (specific conductivity and temperature) collected via loglogger from 4/7/2008 - 8/26/2008. Additional discrete samples collected via multi-probe system. Measurements taken from Laguna Salada, Horse Stable Pond, monitoring wells on

GGNRA property near Mori Point and from ponded water in the drainage channel
near Sanchez Creek.

Exhibits and Dockets

Horse Stable Pond pump house log provided by the City and County of San Francisco

Egg mass survey data collected by the City and County of San Francisco from 2005-07,

Egg mass monitoring reports prepared by the GGNRA covering the years 2003-2005,
and 2006-2009,

Declaration provided by Dr. Marc Jennings in opposition to plaintiffs' motion for
preliminary injunction, Docket No. 68, and the associated exhibits

Declaration of William Vandivere in opposition to plaintiffs' motion for preliminary
injunction, Docket No. 66-2, and the associated exhibits

Deposition transcript of pump house stationary engineer John Ascariz

1. Source of hydraulic conductivity values used in water budget – see exhibit

Declaration of Jewel Snavelly in Support of Plaintiffs Motion for a Preliminary
Injunction, Docket No. 60-2, Ex. 4, and all associated exhibits.

Declaration of John Bowie in Support of Plaintiffs' Motion for a Preliminary Injunction,
Docket No. 60-3, Ex. 26, and all associated exhibits.

Photos of Horse Stable Pond Pump house 1/18/12.

EXHIBIT D

EXHIBIT E

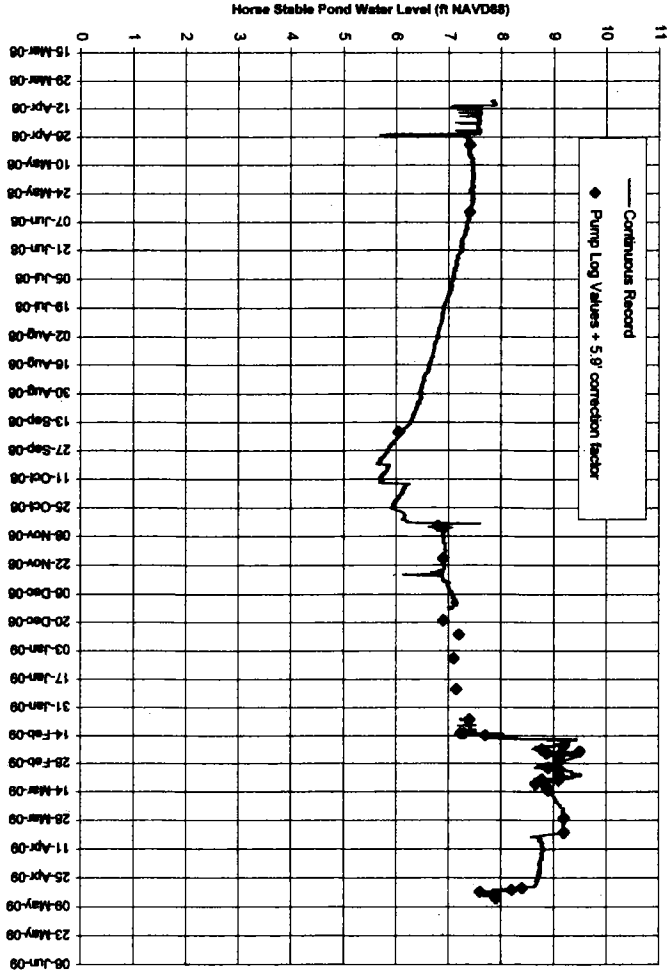
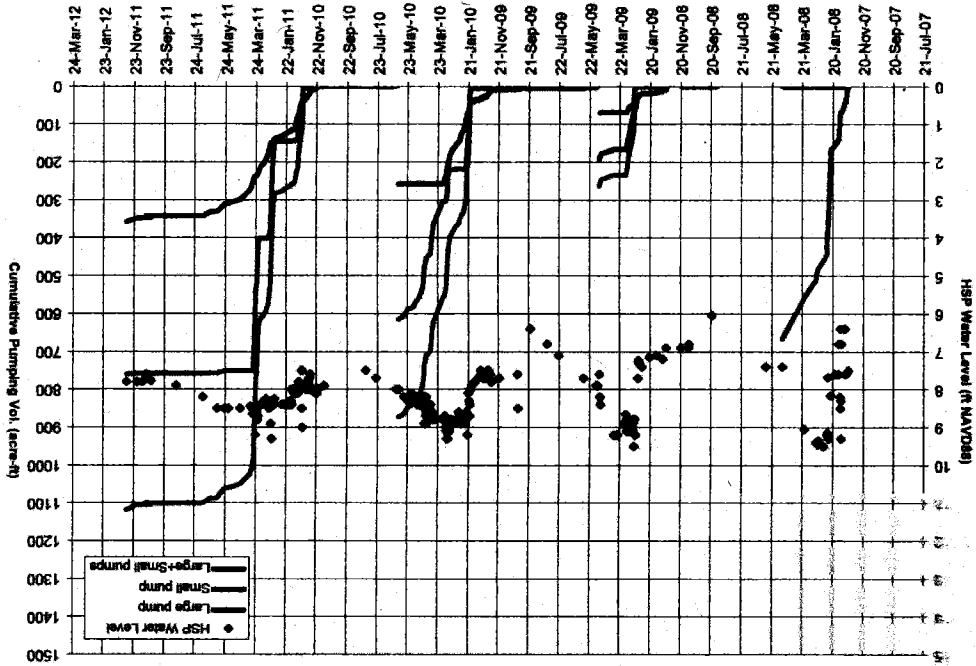


EXHIBIT G



	gpd/ft ²	
	lower	upper
1 Freeze & Cherry, 1979: clean sand	10.00	60,000
2 USGS, 1987: clean sand	10.00	8,000
3 Driecoll, 1988: fine to coarse sand	0.80	30,000
4 ASCE, 1998: fine to coarse	0.25	24,537
5 Domenico & Swartz, 1990: coarse sand	1.91	12,720
6 Domenico & Swartz, 1990: medium sand	1.91	1,060
7 Domenico & Swartz, 1990: fine sand	0.42	424

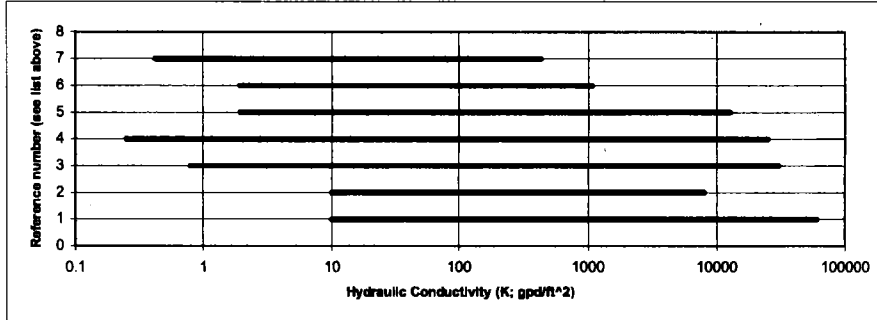


EXHIBIT H

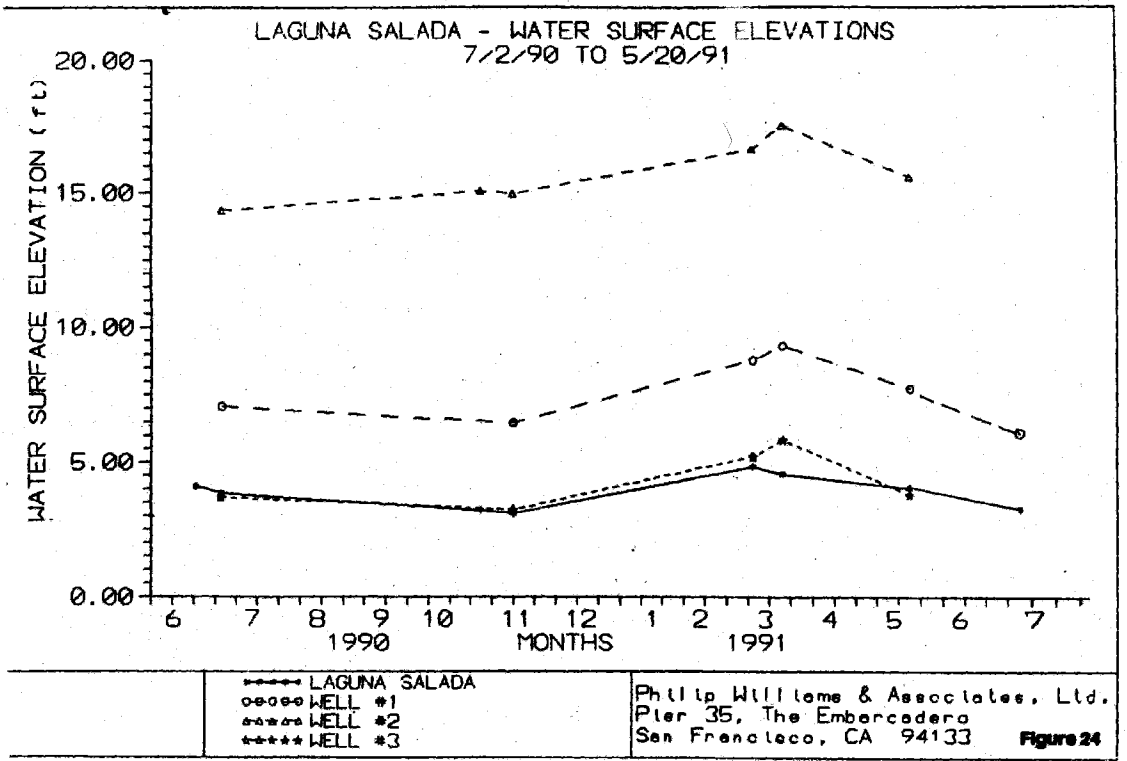
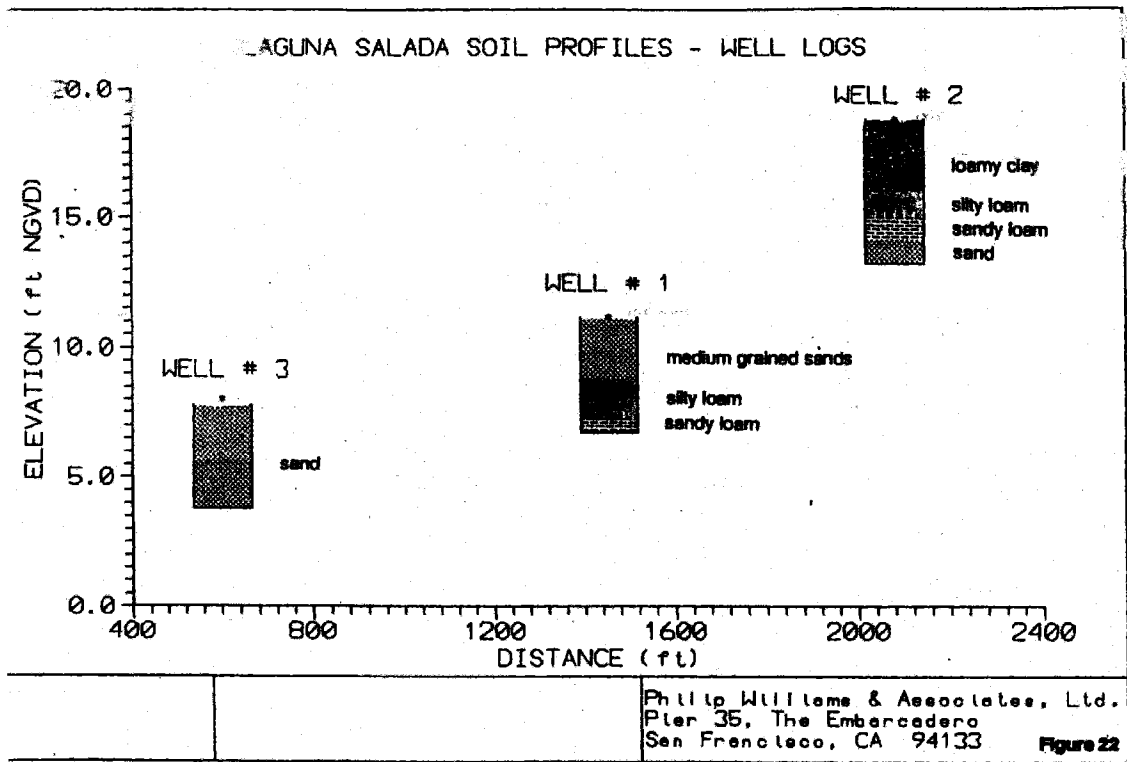


EXHIBIT I

City	Start Pond Level (CFS)	Start Volume (CFS)	Start Wind Area (CFS)	GW Outflow - Beach Seepage Rate (CFS)	GW Outflow - Beach Seepage Gradient (AS)	GW Inflow (AS)	End Volume (AS)	End Pond Level (CFS)	End Wind Area (CFS)	
1	0.10	33.4	40.2	12.300	0.0087	3.33	0.02	13.7	10.12	35.5
2	0.12	32.1	39.2	12.150	0.0087	3.25	0.02	12.8	10.04	35.9
3	0.04	25.8	30.9	11.818	0.0065	3.11	0.02	12.6	9.96	35.3
4	0.06	25.8	30.3	11.677	0.0065	2.99	0.02	12.8	9.87	37.1
5	0.07	22.8	37.1	11.422	0.0062	2.88	0.02	12.0	9.79	37.1
6	0.09	19.0	37.1	11.177	0.0060	2.74	0.02	11.2	9.71	36.8
7	0.10	16.0	36.8	10.932	0.0058	2.60	0.02	10.4	9.63	35.9
8	0.03	14.6	30.0	10.687	0.0056	2.45	0.02	11.1	9.55	35.9
9	0.04	12.1	35.5	10.505	0.0055	2.22	0.02	10.7	9.47	34.8
10	0.10	10.7	35.0	10.268	0.0073	2.22	0.02	10.7	9.47	34.8
11	0.12	10.7	34.6	10.100	0.0072	2.25	0.02	10.2	9.39	34.1
12	0.30	106.2	34.1	9.909	0.0071	2.15	0.02	10.3	9.30	33.7
13	0.30	103.1	33.7	9.728	0.0069	2.07	0.02	10.1	9.24	33.2
14	0.14	98.1	33.2	9.548	0.0068	1.98	0.02	9.9	9.18	32.8
15	0.14	98.1	32.8	9.368	0.0066	1.89	0.02	9.7	9.12	32.4
16	0.12	97.2	32.5	9.215	0.0066	1.85	0.02	9.6	9.07	32.1
17	0.07	95.3	32.1	9.057	0.0065	1.80	0.02	9.5	9.02	31.7
18	0.02	93.8	31.7	8.904	0.0064	1.74	0.02	9.1	8.96	31.4
19	0.08	91.8	31.4	8.756	0.0062	1.67	0.02	9.0	8.90	31.0
20	0.00	90.2	31.0	8.603	0.0061	1.61	0.02	8.9	8.85	30.7
21	0.05	88.4	30.7	8.456	0.0060	1.56	0.02	8.7	8.79	30.4
22	0.05	86.8	30.4	8.304	0.0059	1.51	0.02	8.6	8.74	30.1
23	0.14	85.1	30.1	8.156	0.0058	1.45	0.02	8.4	8.68	29.8
24	0.09	84.2	29.8	8.007	0.0057	1.39	0.02	8.2	8.64	29.6
25	0.04	82.8	29.6	7.856	0.0056	1.33	0.02	8.1	8.60	29.3
26	0.00	81.5	29.3	7.708	0.0055	1.28	0.02	8.0	8.55	29.1
27	0.05	80.3	29.1	7.558	0.0054	1.24	0.02	7.9	8.51	28.8
28	0.03	79.1	28.9	7.398	0.0053	1.20	0.02	7.8	8.47	28.6
29	0.03	78.1	28.6	7.238	0.0052	1.16	0.02	7.7	8.43	28.3
30	0.03	77.1	28.3	7.078	0.0051	1.12	0.02	7.6	8.39	28.2
31	0.03	76.1	28.2	6.918	0.0050	1.09	0.02	7.4	8.35	28.0
32	0.03	74.8	28.0	6.750	0.0049	1.06	0.02	7.3	8.31	27.8
33	0.03	73.5	27.8	6.578	0.0048	1.02	0.02	7.2	8.28	27.6
34	0.03	72.5	27.6	6.408	0.0048	0.99	0.02	7.1	8.24	27.4
35	0.03	71.6	27.4	6.238	0.0047	0.96	0.02	7.0	8.20	27.2
36	0.03	70.7	27.2	6.068	0.0046	0.93	0.02	6.9	8.16	27.0
37	0.03	69.7	27.0	5.898	0.0046	0.90	0.02	6.8	8.12	26.8
38	0.03	68.9	26.8	5.728	0.0045	0.88	0.02	6.7	8.08	26.7
39	0.03	68.0	26.7	5.558	0.0045	0.85	0.02	6.6	8.04	26.5
40	0.03	67.2	26.5	5.388	0.0044	0.83	0.02	6.4	8.00	26.3
41	0.03	66.4	26.3	5.218	0.0043	0.81	0.02	6.3	7.96	26.2
42	0.03	65.6	26.2	5.048	0.0043	0.79	0.02	6.2	7.92	26.0
43	0.03	64.8	26.0	4.878	0.0042	0.77	0.02	6.1	7.88	25.8
44	0.03	64.1	25.9	4.708	0.0042	0.74	0.02	6.0	7.84	25.6
45	0.03	63.3	25.5	4.538	0.0041	0.71	0.02	6.0	7.80	25.3
46	0.03	62.7	25.3	4.368	0.0040	0.69	0.02	6.0	7.77	25.1
47	0.03	62.0	25.1	4.198	0.0039	0.67	0.02	6.1	7.74	24.9
48	0.03	61.3	24.9	4.028	0.0039	0.65	0.02	6.0	7.70	24.7
49	0.03	60.7	24.7	3.858	0.0038	0.63	0.02	6.0	7.67	24.5
50	0.03	60.1	24.5	3.688	0.0038	0.61	0.02	6.0	7.64	24.3
51	0.03	59.5	24.3	3.518	0.0037	0.59	0.02	5.9	7.61	24.1
52	0.03	58.9	24.1	3.348	0.0037	0.57	0.02	5.9	7.57	23.9
53	0.03	58.4	23.9	3.178	0.0036	0.56	0.02	5.8	7.54	23.7
54	0.03	57.9	23.7	3.008	0.0035	0.54	0.02	5.7	7.50	23.5
55	0.03	57.3	23.5	2.838	0.0035	0.53	0.02	5.6	7.46	23.4
56	0.03	56.8	23.4	2.668	0.0034	0.51	0.02	5.6	7.42	23.2
57	0.03	56.3	23.2	2.498	0.0034	0.50	0.02	5.5	7.38	23.0
58	0.03	55.9	23.0	2.328	0.0034	0.48	0.02	5.4	7.34	22.9
59	0.03	55.5	22.9	2.158	0.0033	0.46	0.02	5.4	7.30	22.7
60	0.03	55.0	22.7	1.988	0.0033	0.44	0.02	5.3	7.26	22.6
61	0.03	54.5	22.6	1.818	0.0032	0.43	0.02	5.1	7.21	22.4
62	0.03	54.1	22.4	1.648	0.0032	0.42	0.02	5.1	7.17	22.2
63	0.03	53.7	22.2	1.478	0.0031	0.41	0.02	5.0	7.13	22.0
64	0.03	53.3	22.0	1.308	0.0031	0.40	0.02	5.0	7.09	21.8
65	0.03	52.9	21.8	1.138	0.0031	0.39	0.02	5.0	7.05	21.6
66	0.03	52.5	21.6	0.968	0.0030	0.38	0.02	5.0	7.01	21.4

day	Start Pond Level (ft)	Start Volume (AF)	Start Wetland Area (Ac)	GW Outflow - Beach Seepage (AF)	GW Inflow (AF)	End Pond Level (ft)	End Volume (AF)	End Wetland Area (Ac)
67	4.2	52.1	21.8	0.0230	0.02	5.8	51.4	21.6
68	7.41	51.4	21.7	0.0230	0.02	5.4	51.4	21.6
69	7.39	51.4	21.7	0.0228	0.02	5.11	51.1	21.3
70	7.37	51.1	21.3	0.0228	0.02	5.0	50.7	21.3
71	7.36	50.7	21.3	0.0228	0.02	5.0	50.4	21.2
72	7.35	50.4	21.2	0.0228	0.02	4.98	50.1	21.1
73	7.34	50.1	21.1	0.0228	0.02	4.98	49.8	21.0
74	7.33	49.8	20.9	0.0227	0.02	4.97	49.7	20.9
75	7.32	49.5	20.8	0.0227	0.02	4.97	49.5	20.8
76	7.29	49.2	20.8	0.0227	0.02	4.97	49.5	20.8
77	7.27	48.9	20.7	0.0227	0.02	4.97	49.5	20.8
78	7.26	48.6	20.6	0.0227	0.02	4.97	49.5	20.8
79	7.25	48.3	20.5	0.0228	0.02	4.97	49.5	20.8
80	7.23	48.0	20.4	0.0228	0.02	4.97	49.5	20.8
81	7.23	47.7	20.3	0.0228	0.02	4.97	49.5	20.8
82	7.21	47.4	20.2	0.0228	0.02	4.97	49.5	20.8
83	7.20	47.2	20.1	0.0228	0.02	4.97	49.5	20.8
84	7.19	47.0	20.1	0.0228	0.02	4.97	49.5	20.8
85	7.17	46.7	20.0	0.0228	0.02	4.97	49.5	20.8
86	7.16	46.5	19.9	0.0228	0.02	4.97	49.5	20.8
87	7.15	46.3	19.8	0.0228	0.02	4.97	49.5	20.8
88	7.15	46.1	19.7	0.0228	0.02	4.97	49.5	20.8
89	7.13	45.8	19.6	0.0228	0.02	4.97	49.5	20.8
90	7.12	45.6	19.5	0.0228	0.02	4.97	49.5	20.8
91	7.11	45.4	19.4	0.0228	0.02	4.97	49.5	20.8
92	7.10	45.1	19.4	0.0228	0.02	4.97	49.5	20.8
93	7.09	44.9	19.4	0.0228	0.02	4.97	49.5	20.8
94	7.08	44.7	19.3	0.0228	0.02	4.97	49.5	20.8
95	7.07	44.5	19.2	0.0228	0.02	4.97	49.5	20.8
96	7.05	44.3	19.2	0.0228	0.02	4.97	49.5	20.8
97	7.05	44.1	19.1	0.0228	0.02	4.97	49.5	20.8
98	7.05	43.9	19.0	0.0228	0.02	4.97	49.5	20.8
99	7.04	43.7	19.0	0.0228	0.02	4.97	49.5	20.8
100	7.02	43.6	18.9	0.0228	0.02	4.97	49.5	20.8
101	7.02	43.4	18.8	0.0228	0.02	4.97	49.5	20.8
102	7.01	43.2	18.8	0.0228	0.02	4.97	49.5	20.8
103	7.00	43.0	18.7	0.0228	0.02	4.97	49.5	20.8
104	7.00	42.8	18.7	0.0228	0.02	4.97	49.5	20.8
105	6.98	42.7	18.6	0.0228	0.02	4.97	49.5	20.8
106	6.98	42.6	18.5	0.0228	0.02	4.97	49.5	20.8
107	6.97	42.4	18.4	0.0228	0.02	4.97	49.5	20.8
108	6.96	42.2	18.3	0.0228	0.02	4.97	49.5	20.8
109	6.95	42.1	18.3	0.0228	0.02	4.97	49.5	20.8
110	6.94	41.9	18.2	0.0228	0.02	4.97	49.5	20.8
111	6.93	41.8	18.2	0.0228	0.02	4.97	49.5	20.8
112	6.92	41.6	18.1	0.0228	0.02	4.97	49.5	20.8
113	6.91	41.5	18.0	0.0228	0.02	4.97	49.5	20.8
114	6.90	41.3	17.9	0.0228	0.02	4.97	49.5	20.8
115	6.89	41.2	17.8	0.0228	0.02	4.97	49.5	20.8
116	6.89	41.1	17.7	0.0228	0.02	4.97	49.5	20.8
117	6.88	41.0	17.7	0.0228	0.02	4.97	49.5	20.8
118	6.87	40.9	17.6	0.0228	0.02	4.97	49.5	20.8
119	6.87	40.8	17.6	0.0228	0.02	4.97	49.5	20.8
120	6.86	40.6	17.5	0.0228	0.02	4.97	49.5	20.8
121	6.85	40.5	17.4	0.0228	0.02	4.97	49.5	20.8
122	6.84	40.4	17.4	0.0228	0.02	4.97	49.5	20.8
123	6.83	40.2	17.3	0.0228	0.02	4.97	49.5	20.8
124	6.83	40.1	17.3	0.0228	0.02	4.97	49.5	20.8
125	6.82	40.0	17.2	0.0228	0.02	4.97	49.5	20.8
126	6.81	39.9	17.1	0.0228	0.02	4.97	49.5	20.8
127	6.81	39.8	17.1	0.0228	0.02	4.97	49.5	20.8
128	6.80	39.7	17.0	0.0228	0.02	4.97	49.5	20.8
129	6.79	39.6	17.0	0.0228	0.02	4.97	49.5	20.8
130	6.79	39.5	16.9	0.0228	0.02	4.97	49.5	20.8
131	6.78	39.4	16.9	0.0228	0.02	4.97	49.5	20.8
132	6.77	39.3	16.8	0.0228	0.02	4.97	49.5	20.8

day	Start Pond Level (ft)	Start Volume (AF)	Start Wetland Area (Ac)	GW Outflow - Beach Seepage (AF)	GW Inflow (AF)	End Pond Level (ft)	End Volume (AF)	End Wetland Area (Ac)
133	6.77	39.2	16.8	0.0228	0.02	4.97	49.5	20.8
134	6.77	39.0	16.7	0.0228	0.02	4.97	49.5	20.8
135	6.76	38.9	16.7	0.0228	0.02	4.97	49.5	20.8
136	6.75	38.8	16.6	0.0228	0.02	4.97	49.5	20.8
137	6.74	38.6	16.6	0.0228	0.02	4.97	49.5	20.8
138	6.74	38.5	16.6	0.0228	0.02	4.97	49.5	20.8
139	6.73	38.3	16.5	0.0228	0.02	4.97	49.5	20.8
140	6.72	38.1	16.5	0.0228	0.02	4.97	49.5	20.8
141	6.72	38.0	16.4	0.0228	0.02	4.97	49.5	20.8
142	6.72	37.8	16.4	0.0228	0.02	4.97	49.5	20.8
143	6.71	37.7	16.3	0.0228	0.02	4.97	49.5	20.8
144	6.71	37.5	16.3	0.0228	0.02	4.97	49.5	20.8
145	6.71	37.3	16.3	0.0228	0.02	4.97	49.5	20.8
146	6.70	37.1	16.2	0.0228	0.02	4.97	49.5	20.8
147	6.70	36.9	16.2	0.0228	0.02	4.97	49.5	20.8
148	6.69	36.8	16.1	0.0228	0.02	4.97	49.5	20.8
149	6.68	36.6	16.1	0.0228	0.02	4.97	49.5	20.8
150	6.68	36.4	16.0	0.0228	0.02	4.97	49.5	20.8
151	6.66	36.3	16.0	0.0228	0.02	4.97	49.5	20.8
152	6.66	36.1	16.0	0.0228	0.02	4.97	49.5	20.8
153	6.67	35.9	15.9	0.0228	0.02	4.97	49.5	20.8
154	6.67	35.7	15.9	0.0228	0.02	4.97	49.5	20.8
155	6.67	35.5	15.8	0.0228	0.02	4.97	49.5	20.8
156	6.66	35.4	15.8	0.0228	0.02	4.97	49.5	20.8
157	6.66	35.2	15.7	0.0228	0.02	4.97	49.5	20.8
158	6.65	35.1	15.7	0.0228	0.02	4.97	49.5	20.8
159	6.65	34.9	15.6	0.0228	0.02	4.97	49.5	20.8
160	6.65	34.8	15.6	0.0228	0.02	4.97	49.5	20.8
161	6.64	34.7	15.5	0.0228	0.02	4.97	49.5	20.8
162	6.64	34.5	15.5	0.0228	0.02	4.97	49.5	20.8
163	6.64	34.3	15.4	0.0228	0.02	4.97	49.5	20.8
164	6.64	34.1	15.4	0.0228	0.02	4.97	49.5	20.8
165	6.63	34.0	15.4	0.0228	0.02	4.97	49.5	20.8
166	6.63	33.8	15.3	0.0228	0.02	4.97	49.5	20.8
167	6.62	33.6	15.3	0.0228	0.02	4.97	49.5	20.8
168	6.62	33.4	15.2	0.0228	0.02	4.97	49.5	20.8
169	6.62	33.2	15.2	0.0228	0.02	4.97	49.5	20.8
170	6.61	33.1	15.1	0.0228	0.02	4.97	49.5	20.8
171	6.61	32.9	15.1	0.0228	0.02	4.97	49.5	20.8
172	6.60	32.8	15.0	0.0228	0.02	4.97	49.5	20.8
173	6.60	32.6	15.0	0.0228	0.02	4.97	49.5	20.8
174	6.60	32.4	14.9	0.0228	0.02	4.97	49.5	20.8
175	6.60	32.2	14.9	0.0228	0.02	4.97	49.5	20.8
176	6.59	32.1	14.8	0.0228	0.02	4.97	49.5	20.8
177	6.59	31.9	14.8	0.0228	0.02	4.97	49.5	20.8
178	6.58	31.8	14.7	0.0228	0.02	4.97	49.5	20.8
179	6.58	31.6	14.7	0.0228	0.02	4.97	49.5	20.8
180	6.58	31.4	14.6	0.0228	0.02	4.97	49.5	20.8
181	6.57	31.3	14.6	0.0228	0.02	4.97	49.5	20.8
182	6.57	31.1	14.5	0.0228	0.02	4.97	49.5	20.8
183	6.57	30.9	14.5	0.0228	0.02	4.97	49.5	20.8
184	6.57	30.7	14.4	0.0228	0.02	4.97	49.5	20.8
185	6.56	30.6	14.4	0.0228	0.02	4.97	49.5	20.8
186	6.56	30.4	14.3	0.0228	0.02	4.97	49.5	20.8
187	6.56	30.2	14.3	0.0228	0.02	4.97	49.5	20.8
188	6.55	30.1	14.2	0.0228	0.02	4.97	49.5	20.8
189	6.55	29.9	14.2	0.0228	0.02	4.97	49.5	20.8
190	6.54	29.8	14.1	0.0228	0.02	4.97	49.5	20.8
191	6.54	29.6	14.1	0.0228	0.02	4.97	49.5	20.8
192	6.54	29.4	14.0	0.0228	0.02	4.97	49.5	20.8
193	6.54	29.2	14.0	0.0228	0.02	4.97	49.5	20.8
194	6.54	29.0	13.9	0.0228	0.02	4.97	49.5	20.8
195	6.54	28.8	13.9	0.0228	0.02	4.97	49.5	20.8
196	6.54	28.6	13.8	0.0228	0.02	4.97	49.5	20.8
197	6.54	28.4	13.8	0.0228	0.02	4.97	49.5	20.8
198	6.54	28.2	13.7	0.0228	0.02	4.97	49.5	20.8
199	6.54	28.0	13.7	0.0228	0.02	4.97	49.5	20.8
200	6.54	27.8	13.6	0.0228	0.02	4.97	49.5	20.8

stage (ft)	volume ft ³	area ft ²	volume AF	area acres
0	0	0	0.0	0.0
1	6,000	42,100	0.1	1.0
2	97,000	157,200	2.2	3.6
3	293,000	227,700	6.7	5.2
4	551,000	289,600	12.6	6.6
5	874,000	358,200	20.1	8.2
6	1,271,000	449,400	29.2	10.3
6.5	1,517,000	632,400	34.8	14.5
7	1,870,000	814,700	42.9	18.7
8	2,820,000	1,133,000	64.7	26.0
9	4,048,000	1,376,100	92.9	31.6
10	5,540,000	1,680,500	127.2	38.6
11	7,329,000	2,035,100	168.3	46.7
12	9,510,000	2,459,300	218.3	56.5
13	12,100,000	2,854,800	277.8	65.5
14	15,090,000	3,214,400	346.4	73.8
15	18,440,000	3,553,700	423.3	81.6
16	22,100,000	3,778,500	507.3	86.7
17	25,960,000	3,953,600	596.0	90.8

EXHIBIT D
 Repty Declaration of Greg Kamman
 Stage-Volume-Surface Area Relationships for
 Laguna Salada Project Area

EXHIBIT K

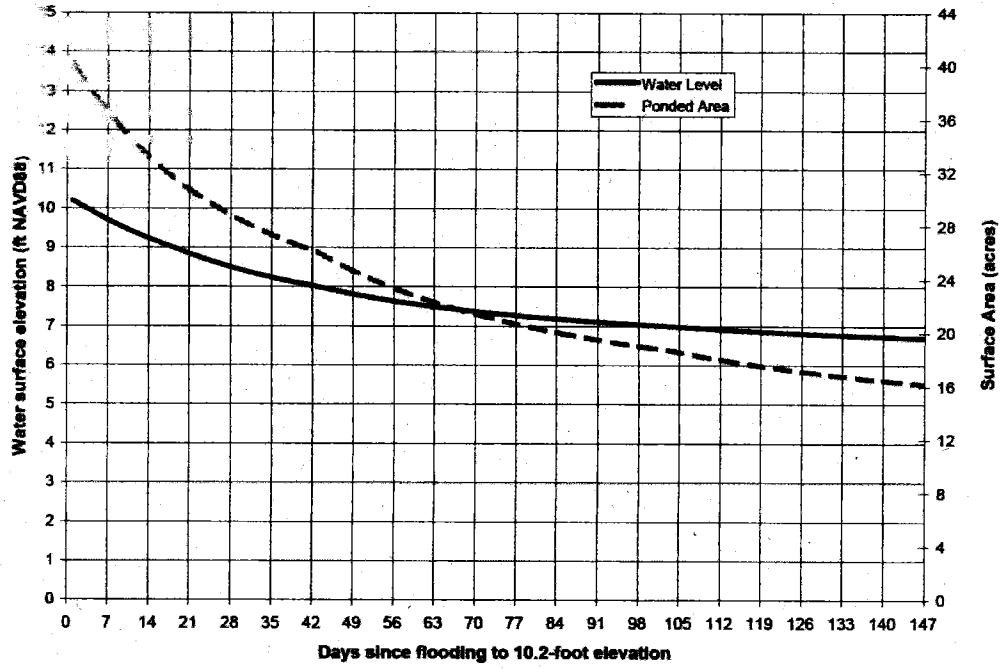


EXHIBIT L



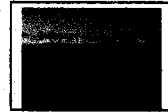
EXHIBIT
Greg Kamman Declaration
Mobile Pumping at Sharp Park Near Lakeside Avenue and Clarendon Road
Sharp Park Golf Course

EXHIBIT G



Peter R. Baye, Ph.D.
 Coastal Ecologist, Botanist
 33660 Annapolis Road
 Annapolis, California 95412

baye@earthlink.net
 (415) 310-5109



San Francisco Planning Department
 1650 Mission St.
 Suite 400
 San Francisco,
 CA 94103-2479
 attention: Kei Zushi - (415) 575-9036 kei.zushi@sfgov.org

via email

October 18, 2013

SUBJECT: Notification of Availability and Intent to Adopt Mitigated Negative Declaration, September 18, 2013, Case No 2012.1427E, Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project; concerns regarding potential environmental effects

To the San Francisco Planning Department:

I would like to submit the following comments on the proposed Mitigated Negative Declaration for the Sharp Park Enhancement Project. These comments follow my scoping comments submitted on January 29, 2013, which are incorporated by reference.

1. Project purpose of improved lagoon and wetland drainage lacks assessment of significant impacts.

The project site description on page 3 of the MND explicitly states that the purpose of constructing the 1000 ft long connector channel between Horse Stable Pond (HSP) and Laguna Salada is to drain the lagoon and wetlands within the hydrologically linked wetland complex:

The Sharp Park Golf Course is located within an 845-acre watershed. HSP is located south of LS and consists of an open water pond and a freshwater wetland. It is connected to LS via an approximately 1,000-foot-long channel that was constructed to drain water from the lagoon to HSP, and together these three features form a wetland complex.

MND p. 3 (emphasis added)

Page 4 of the MND explains that the growth of tules and cattails in the connector channels impairs the drainage of the lagoon by pumps at HSP, consistent with conclusions of Kamman

Peter R. Baye Ph.D.
 Botanist, Coastal Ecologist
 baye@earthlink.net
 (415) 310-5109

(2009). The description of the proposed project activities on page 5 of the MND states that the channel would be cleared of vegetation and sediment to remedy obstruction of flows between HSP and the main pond or lagoon, improving ability to drain water from the lagoon by pumping: "3) removal of sediment and emergent vegetation within HSP and the connecting channel that links HSP with LS". The MND, however, completely fails to assess the hydrological and ecological impacts of increasing drainage of the lagoon by increasing hydraulic connectivity between the main lagoon pond and HSP, even though it is clearly the basic purpose of the action. Any significant change in the duration and depth of flooding or soil saturation in lagoon wetlands has important ecological effects. Increased drainage of wetlands, above baseline (pre-project) conditions is a potentially significant impact I cited in my scoping comments on this project (Baye 2013). My scoping comments appear to be entirely ignored about this most basic modification of lagoon wetland hydrology, and their impacts on further spread of cattails and tules. To reiterate my scoping comments from 29 January 2013 regarding wetland hydrology impacts on wetland vegetation and habitat structure:

Lagoon drainage (pumping) effects

- o What are the impacts of lowered lagoon water levels (lagoon drawdown) on the spread of cattails and tules over the lagoon bed? (potential indirect significant impact)
- o What are the baseline (pre-project) effects of lagoon drainage (pumping, lowering lagoon levels) on water depths and the spread of cattails and tules on the lagoon bed? (baseline for assessment of potential indirect significant impact)
- o What does SFRPD assume to be the critical limiting water depth range, and duration of limiting flood depth, for tules and cattails? (threshold for potential indirect significant impact)
- o How long, and in what time of year, would areas of the lagoon be lowered to submergence depths that are shallower than the presumed critical depth for restricting spread of cattails beyond their pre-project extent? (threshold and mechanism for potential indirect significant impact)
- o What is the *minimum area* of the lagoon bed that would be maintained at depths beyond the limits of submergence tolerance of cattails and tules? (threshold for potential indirect significant impact)
- o What is the *maximum duration* of drawdown (lagoon lowering) to depths shallower than the limit of submergence tolerance of cattails and tules? (threshold for potential indirect significant impact)
- o How will maintenance of low lagoon levels prior to storms (lagoon drawdown for stormwater detention capacity) affect the *vulnerability of the lagoon to seawater flooding during oceanic storm overwash events*? How much will drawing down the lagoon prior to storms impair the lagoon's capacity trap heavier seawater overwash flooding at the lagoon bottom by stratification of heavier saltwater under lighter freshwater? How much would lagoon drawdown

Peter R. Baye Ph.D.
 Botanist, Coastal Ecologist
 baye@earthlink.net
 (415) 310-5109

during winter storm season expose the marsh shoreline to potential direct ocean water flooding, or flooding by less diluted seawater, compared with full freshwater-flooded lagoon conditions? (threshold and mechanism for potential indirect long-term significant impact)

- o How will maintenance of proposed target lagoon levels affect the *elevation range* of freshwater and fresh-brackish marsh habitat of listed threatened and endangered wildlife species in relation to the elevation range of rising sea level or potential storm oceanic overwash flooding?

The MND completely fails to address potentially significant direct and indirect hydrological impacts of the proposed project's drainage component on Laguna Salada wetlands, despite my detailed scoping comments on this subject. There is no proposed mitigation for increasing the drainage of the lagoon, and making its bed shallower more often than pre-project conditions. Increasing the drainage of the lagoon will increase the spread of cattails and tules over the remaining open water. Cattails and tules are primarily limited by water depth and duration, which is directly affected by drainage and pumping. SFRPD continues to provide no direct evidence of significant recent sedimentation within the main lagoon pond commensurate with the timing, rate or magnitude of cattail and tule spread. The proposed project will likely accelerate the spread of tules and cattails. This will foreseeably result in even more misguided proposals to dredge the lagoon to remedy fictional "sedimentation" problems and "vegetation overgrowth" that is in fact directly related to the drainage of the lagoon.

2. Salinity and seawater sources of sulfur

Oligohaline (fresh-brackish) lagoon salinity is incorrectly reported as "freshwater", inconsistent with Tetra Tech 2009 and Kamman 2009. The project description in the MND on page 3, and subsequently, describes the lagoon as a "freshwater" pond and wetlands. This is incorrect, and is inconsistent with the hydrological assessment of Laguna Salada prepared for SFRPD by Tetra Tech (2009), based on the hydrologic report on Laguna Salada by Kamman (2009; Appendix A in Tetra Tech 2009). The SFRPD's own hydrological studies report salinity range between 0.7 and 2.5 parts per thousand (ppt). This salinity range is also correctly stated on p. 94 of the MND. This salinity range is oligohaline, not "freshwater", and is physiologically and ecologically significant. It indicates a persistent dilution of salts from seawater either seeping through the Salada Beach, residual salinity in the bed sediments. Seawater sources of salinity include sulfates, a source of sulfur affecting bed sediments and coastal wetland soils. The MND is inconsistent in its statement of lagoon salinity, and incorrect in characterizing it as "freshwater".

Kamman (2009) described "freshwater" as salinity < 1.0 ppt. He reported that the earthen "seawall" eliminates characteristic (natural) episodic tidal exchange between the ocean and lagoon, but it did not state that all hydrologic connectivity is lacking between the lagoon and ocean. On the contrary, Kamman reported evidence of probable groundwater connectivity between lagoon and ocean through beach seepage, and recorded relatively saline groundwater with a salinity of 15 ppt (nearly half seawater salinity concentration) was observed in the sandy flat between Laguna Salada and the earthen seawall. This is also not consistent with the MND's claim of "freshwater" pond and wetlands. Note that cattail and tule marsh vegetation dominance occurs in both freshwater and oligohaline wetlands, and is not diagnostic of freshwater salinity range.

The incorrect statement of lagoon salinity is important because the MND's *unlikely* is based on the assumption that exclusion seawater salts from the lagoon precludes the occurrence of sulfur from seawater to fuel significant sulfide reduction in organic, anoxic sediments. Obviously, the consistent low salinity in the lagoon indicates seawater salts are always present – including sulfate, the next most abundant anion in seawater after chloride.

3. Sulfide and acid sulfate biogeochemical impacts and mitigation.

The explanation of sulfur oxidation-reduction sediment biogeochemistry on page 96 of the MND (water quality) is essentially accurate, but it is inconsistent with the utterly confused explanation on pp. 76-77 of the MND, which garbles hypoxia, pH, and inconsistent oxidation-reduction state associated with aerobic and anaerobic sediments. Acid sulfates are the oxidized forms of sulfur compounds, not the reduced forms (sulfides) associated with hypoxia and anoxia. The temporary suspension of anoxic iron sulfide-rich sediment, and free hydrogen sulfide (rotten egg scent) in the water column is the cause of acute hypoxia. Oxidative formation of acid sulfates and iron oxides is a slow process occurring over many days or weeks in aerobic conditions.

The MND argues on p. 77 that since no acid sulfate conditions were detected in the last episode of dredging 10 years ago, the impact is unlikely. This is utterly fallacious, since no measurements of soil sulfate levels or pH were sampled. An even more ludicrous fallacy on p. 77 is the exclusion of tidal flows precludes the existence of sulfur sources in sediments. Obviously, if salinity range is up to 2.5 ppt, and the only original salinity source is seawater, sulfates (the second most abundant anion in seawater) is present in the oligohaline sediments. Moreover, I provided direct observation of both iron sulfide and hydrogen sulfide in near-surface anoxic sediments of the exposed bed of Laguna Salada in the ESA-PWA report (ESA-PWA 2010). Strongly sulfidic sediments are ubiquitous and conspicuous throughout the lagoon complex, and readily detectible by any qualified wetland ecologist who looks for them. It is disingenuous of the MND, as well as flatly incorrect, to assert that they are "unlikely"

Proposed mitigation M-Bio-2b fails as a CEQA mitigation measure because it provides no objective chemical standard or biological criteria or threshold for sulfide concentrations, pH, Biological Oxygen Demand (a measure of hypoxia in the suspended sediment plume around dredging sites), or redox thresholds for significant biological impacts. It instead relies on purely subjective voluntary submittal of data (not evidence of actual consultation and reply!) with resource agencies, with no evidence that resource agencies have staff resources or commitments to comply with the mitigation measure. The mitigation measure is vague, programmatic, and unenforceable. Dredge sediments are routinely sampled for aquatic impacts throughout the San Francisco Bay area. It is seldom that dredging occurs in nontidal wetlands with endangered species (for good reason), but the analytic methods for assessing aquatic impacts of hypoxic sediment plumes during dredging are established. They are not cited by the MND. Nor does the MND show any evidence of consultation with the RWQCB – SFB for appropriate dredge sediment and water quality protocols adapted to the distinctive setting of Laguna Salada, including specific criteria for water column hypoxia and sulfide toxicity during dredging. Hypoxia and sulfide toxicity are not the same chemical phenomenon, even though they are physically related by suspension of reduced iron sulfide-rich sediment. The MND is deficient in basic understanding of acid sulfate soils, sulfur oxidation-reduction sediment processes, and ecotoxicity. Below is a limited sample of relevant scientific literature to support improved understanding.

Bagarinao, T. 1992. Sulfide as an environmental factor and toxicant—Tolerance and adaptations in aquatic organisms. *Aquat.Toxicol.* 24:21–62. doi: 10.1016/0166-445X(92)90015-F

Beauchamp, R.O., Bus, J.S., Popp, J.A., Boreiko, C.J., Andjelkovich, D.A., and Leber, P. 1984. A critical review of the literature on hydrogen sulfide toxicity. *Crit. Rev. Toxicol.* 13, 25–97. doi: 10.3109/10408448409029321

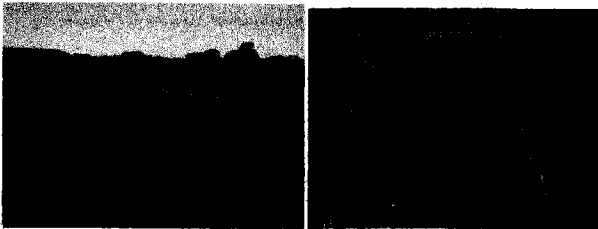
Cornell, W.E., and Patrick, W.H. Jr. 1968. Sulfate reduction in soil: effects of redox potential and pH. *Science* 159, 86–87. doi:10.1126/science.159.3810.86

Dent, D. 1986. Acid Sulphate Soils: a Baseline for Research and Development. Wageningen: ILRI Publ. <http://www2.alterra.wur.nl/Internet/webdocs/ilri-publicaties/publicaties/Pub39/pub39-h1.0.pdf>

Dent, D. and Dawson, B. undated. The Acid Test: an expert system for acid sulfate soils. <http://www.isric.org/sites/default/files/AcidSKIt/identman.pdf>

Lamers, L.P.M., Tomassen, H.B.M., and Roelofs, J.G.M. 1998. Sulfate-induced eutrophication and phytotoxicity in freshwater wetlands. *Environ. Sci. Technol.* 32, 199–205.

Lamers, Leon P.M., Josepha M.H. van Diggelen, Huub J.M. Opden Camp, Eric J.W. Visser, Esther C.H.E.T. Lucassen, Melanie A. Vile, Mike S.M. Jetten, Alfons J.P. Smolders and Jan G.M. Roelofs. 2012. Microbial transformations of nitrogen, sulfur, and iron dictate vegetation composition in wetlands: a review. *Frontiers in Microbiology* 26:1-12. doi: 10.3389/fmicb.2012.00156



Iron oxide surface films and iron sulfide accumulation of muds exposed by artificial lagoon drawdown at Laguna Salada, 2010. Iron oxide (orange-brown mineral films indicative of oxidation of iron sulfide and acid sulfates in brackish coastal sediments subject to alternating strong hypoxia and oxidation) are apparent in drawdown-emergent muds at the northeast end of Laguna Salada (left). Organic-rich sediment immediately below the iron oxide-stained surface sediment film is deep black (right), indicative of toxic iron sulfide, formed under strong anoxic (reducing) conditions, exposed at the marsh surface by artificial drawdown of the lagoon.

Peter R. Baye Ph.D.
Botanist, Coastal Ecologist
baye@earthlink.net
(415) 310-5109

5

4. Archaeological resources and significant impacts.

The MND on page 30 states that the project could have significant impacts on buried archaeological resources, given the location of known midden sites, and the depth of proposed excavation. The proposed mitigation to reduce this significant impact to less than significant levels relies entirely on excavation equipment operators with no expertise in detection of archaeological artifacts (such as shells, bones, heat-altered rocks, bone or stone tools, or flaked stone) to detect “accidental discovery” in excavated jet-black iron sulfide-stained organic mud during excavation, and in time to cease excavation and disturbance upon detection. This is not a credible or feasible mitigation measure. I have ample experience over two decades observing excavation and dredging of coastal wetland and aquatic sediments, including strongly organic and sulfidic muds like those that occur in Horse Stable Pond. Organic and iron-sulfide staining of bulk sediment removal would render any small midden artifacts utterly undetectable in the absence of sorting (sieving) and washing. The mitigation measure proposed is infeasible. Advance assessment of archeological resources (a sampling plan prepared by a qualified archeologist) at proposed dredging sites would be required to detect buried archeological resources in organic, iron sulfide-stained fine sediments.

Sincerely,

Peter Baye
baye@earthlink.net

Literature Cited

Baye, P. 2013. Scoping comment letter in response to Notification of Project Environmental Review dated January 15, 2013, Case No 2012.1427E, Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project; concerns regarding potential environmental effects. submitted January 29, 2013.

ESA-PWA, Peter Baye, and Dawn Reis. 2010. Preliminary Ecosystem Restoration Feasibility Assessment, Laguna Salada, Pacifica, CA. Report prepared for Wild Equity.

Kamman, G. 2009. Sharp Park Conceptual Restoration Alternatives Report. APPENDIX A: HYDROLOGICAL REPORT. In: Tetra Tech (2009).

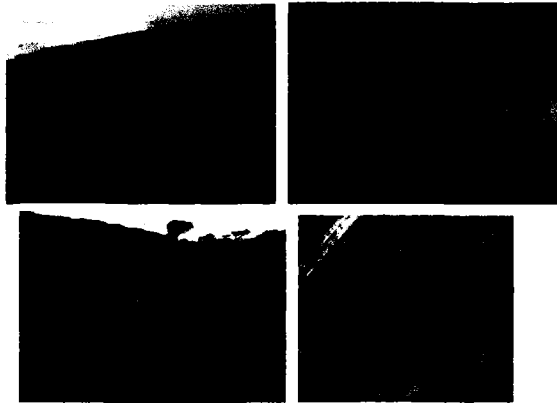
Tetra Tech, K. Swaim, and Nickels Golf Group. 2009. Sharp Park Conceptual Alternatives Report. Prepared for San Francisco Recreation and Parks Department.

Peter R. Baye Ph.D.
Botanist, Coastal Ecologist
baye@earthlink.net
(415) 310-5109

6

**CRITICAL REVIEW OF THE BIOLOGICAL ASSESSMENT for the
"SHARP PARK SAFETY, INFRASTRUCTURE
IMPROVEMENT AND HABITAT ENHANCEMENT PROJECT"
(MAY 2012), Pacifica, San Mateo County, California**

Peter R. Baye, Ph.D.
Coastal Ecologist, Botanist
33660 Annapolis Road
Annapolis, California 95412
bye@earthlink.net



Prepared for Wild Equity Institute, Oakland, California
June 2012

1.0. Introduction

The purpose of this critical review is to provide an independent assessment of the following aspects of the Biological Assessment (BA) for the Sharp Park (...Infrastructure...) Project, prepared by the San Francisco Recreation and Parks Department, March 2012, revised May 2012:

- ecological validity and accuracy of the BA's assumptions and findings
- critical omissions of ecological information presented in the BA
- feasibility of the proposed take minimization measures
- consistency of BA proposals with recovery plans for the two listed species featured, San Francisco garter snake (SFGS) and California red-legged frog (CRLF)
- internal consistency of the BA, and consistency with other SFRPD background documents on Sharp Park/Laguna Salada wetlands and endangered species
- consistency with ESA regulations regarding biological assessments and preparation of BAs by designated non-federal representatives of the lead Federal agency

My qualifications to provide critical scientific and regulatory review of the BA are based on my professional experience (over 30 years) in coastal wetland and terrestrial ecology, my academic background in coastal ecology (Ph.D. University of Western Ontario), and my experience preparing and reviewing biological assessments and conducting formal and informal Section 7 ESA consultations for the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Service (USFWS), as well as preparing endangered species recovery plans (coastal wetland and terrestrial ecosystems) for USFWS. One of my areas of specialization is restoration and management of fresh-brackish coastal California lagoons. I was lead ecologist co-author of two California State Parks lagoon management/restoration plans supporting California red-legged frogs in the central coast region (Laguna Creek and Pilarcitos Creek lagoons), and I have provided consulting services and peer review for on coastal lagoon enhancement and restoration projects in

State Parks and National Parks jurisdiction in this region (Rodeo Lagoon, Crissy Field (Presidio) Lagoon, Big Lagoon, Scott Creek Lagoon, Waddell Creek Lagoon). I was lead ecologist and co-author of a 2011 technical report on Laguna Salada wetland restoration alternatives (ESA-PWA 2011), and I was an invited speaker to the Sharp Park advisory working group convened by San Francisco Recreation and Parks Department in November 2010, where I presented an introduction to California coastal lagoon wetlands, with an emphasis on Laguna Salada and similar lagoons.

I have reviewed in detail both the BA and its principal supporting documents, including the San Francisco Recreation and Parks Department (SFRPD) alternatives report on Sharp Park (Tetra Tech et al. 2009), including appendix reports on hydrology (KHE 2009) and special-status wildlife (Swaim 2008). As indicated in the comprehensive Laguna Salada ecosystem restoration report I co-authored (ESA-PWA et al. 2011, not cited in the BA), I have detailed, first-hand knowledge of the Laguna Salada barrier beach and backbarrier wetland complex.

My critical review of the BA is presented below, organized by sections emphasizing scientific, feasibility, and regulatory issues of specific BA proposals (Section 2.0), followed by more general review of key scientific and technical issues in or omitted by the BA (Section 3.0), section-specific corrections of erroneous information in the BA (Section 4.0), and conclusions and recommendations (Section 5.0).

2.0. Critical review of specific key Biological Assessment proposals

2.1. The BA proposes dredging of anoxic, high-sulfide lagoon bed and marsh sediments without standard prior sediment testing or mitigation for hypoxia and sulfide toxicity due to suspended anoxic sediments.

The BA proposes to dredge sulfidic anoxic sediments in the primary breeding habitat (HSP) of LS. The BA does not include any proposals to conduct routine dredge sediment testing toxic sulfide and ammonia sediment concentrations, or redox potential, even though the environment is a coastal lagoon immediately behind a barrier beach with a long history of fresh brackish (marine sulfur enriched) hydrology and organic sediment

to fuel microbial reduction to sulfide. Hydrogen sulfide is readily detectible by scent in disturbed bed sediments at Horse Stable Pond, and the color of sediment 1 mm below the surface is jet-black with iron sulfide. There is no question that these sediments are highly reduced, anoxic and sulfidic. There is also no question that sulfidic sediments oxidize to form acid sulfates and iron oxide (rust-colored sediment) when exposed to aerobic environments. Yet the BA fails to disclose or mitigate *foreseeable* significant potential local impact of hypoxia events due to dredge-induced resuspension of anoxic, highly reduced (sulfidic) bottom sediment. Hypoxia, and associated pulses of toxic ammonia and sulfides in anoxic sediment dispersed in suspended sediment plumes are potentially lethal to CRLF tadpoles during and following dredging (ESA-PWA et al. 2011). The small size and lack of refuge from suspended sediment plumes in the small, enclosed HSP lagoon may intensify this foreseeable impact. The proposal to dredge anoxic, sulfidic coastal lagoon sediments without dredge sediment testing, particularly at HSP, the sub-region of Laguna Salada where Swaim (2009) found relatively higher frequency of egg masses, is an undisclosed significant source of potential incidental take that is not minimized by any proposed measures.

2.2. The BA proposes dredging of marsh as "enhancement" without evidence or other rational ecological basis.

The BA falsely proposes dredging to "enhance" CRLF habitat at Horse Stable Pond which it reports is nearly 50% open water and marsh. The BA provides no evidence that the relatively high proportion of open water, and high linear extent of freshwater marsh and open water, are currently limiting factors for CRLF breeding success at HSP, and are contradicted by SFRP's own data on the frequency of egg masses (Swaim 2009), which indicated relatively higher egg mass deposition at HSP at least in 2008. The BA fails to provide any evidence-based analysis of limiting factors for reproductive success of CRLF at Laguna Salada, and relies on selective and subjective judgment that arbitrarily excludes evidence from a contemporary comprehensive analysis of wetland degradation (PWA 2011). The BA fails to cite any precedent (previous USFWS-authorized CLRF habitat enhancement project for recovery of the species, or recovery plan guidance) or

other rational basis for dredging anoxic fresh-brackish sulfidic marsh substrate as an alleged "enhancement" for CRLF. The BA arbitrarily leaps to the conclusion that dredging, which the applicant desires for the independent purpose of pumping and draining the lagoon and its wetlands, has sufficient independent utility as an "enhancement" for CRLF habitat, without an analysis of risks (see discussion of anoxic and sulfidic lagoon bed sediments and lack of sediment testing, above).

The implicit rationale for dredging Laguna Salada to "enhance" habitat appears to be based on a false (partial) analogy with an entirely different marsh habitat supporting CRLF and SFGS: San Francisco International Airport's West of Bayshore marsh, where marsh excavation has been authorized to increase interspersed open water and marsh habitat for SFGS. The Bayshore freshwater marsh, unlike Laguna Salada, exhibited clear evidence of terrestrial sediment deposition and infilling of the marsh, and loss of interspersed open water/emergent (cattail) marsh edge due to significant terrestrial sediment accretion from urban flood control and storm drainage channels that discharge directly into the marsh. The Bayshore marsh is *not artificially drained by pumps with 10,000 gpm capacity that cause water level drawdown* causing cattails and tules to grow in what would otherwise be excessively deep water. Shallow water depths at Bayshore favoring cattails are caused by urban stormwater sedimentation. Bayshore marsh is passively drained by gravity through flapgates. In contrast, Laguna Salada, is drained by a 10,000 gpm pump that causes rapid drawdown and is the primary control of sustained low water levels (KHE 2009) – year-round drawdown – that promote cattails and tules invasion over the artificially shallow lagoon bed. There is no evidence presented in the BA or supporting documents for any significant current or recent terrestrial sediment discharge from Sanchez Creek into Laguna Salada/ Horse Stable Pond. Sanchez Creek discharges into a large willow thicket and broad marsh before it discharges into HSP, and its banks are densely vegetated, lacking sediment deposits. *Permanent drawdown of lagoon water levels, not substrate elevation change, are what drive tule-cattail marsh vegetation encroachment of Laguna Salada* (ESA-PWA et al. 2011).

There is no dispute that pumping out freshwater from Laguna Salada controls the low lagoon levels all year round, regardless of drought or high rainfall, and the low level of variability in lagoon water levels. The SFRPD's own hydrology report (KHE 2009, Appendix A in Tetra Tech et al. 2009) states:

Inter-annual variability of water levels in the wetlands is low due to the operation of the pumping station. Early spring water levels in the pond areas are consistent between dry, normal, and wet water year types because water level is controlled by the pumping station. (KHE 2009 p. 5)

The BA does not explain that the lagoon would fill (submerging marsh) naturally even in dry years, but for the pumps that maintain drawdown of the lagoon:

Results from a water budget investigation reveal that the system is supplied with adequate water to fill the ponds even in dry years. (KHE 2009, p. 5)

The BA (and Tetra Tech 2009 report) *neither provides nor cites evidence of significant terrestrial sedimentation or bed substrate elevation change at Laguna Salada*. There is no such evidence: the bed surface is fine aquatic muck produced by decomposing algae and vascular plant detritus. That is a fundamental hydrogeomorphic difference between Bayshore and Laguna Salada wetland habitats of CRLF and SFGS. The remedy for habitat degradation at Bayshore's overgrown, overfilled cattail marsh does not apply to Laguna Salada, which has a former deepwater lagoon bed overgrown with cattail and tule because it is excessively drained of freshwater inflows and made shallow by high capacity pumps. In essence, the BA proposes to increase open water/marsh edge by lowering lagoon bed elevations artificially, rather than allow the fresh water levels to rise naturally in winter, so the lagoon remains in a state of permanent drawdown all year round. This is a radical contrast with Bayshore marsh.

2.3. The BA-proposed permanent program of CRLF egg mass translocation is not take minimization, and is apparently not consistent with the approved recovery plan for CRLF.

The BA proposes permanent egg mass translocation program that appears to be

inconsistent with the approved recovery plan for CRLF, and requests authorization of "incidental" take that is not incidental, but primary purpose of translocation. The proposed annual "relocation" of egg masses *in perpetuity*, with USFWS consultation appears to *conflict with the Service's approved final recovery plan for CRLF, which states that relocation is ineffective even for single event relocation of adults* (cited under "inadequate regulatory mechanisms" in the Recovery Plan). Egg mass relocation is not "incidental take" caused by some other permitted activity regulated by the Corps of Engineers permit. It appears to be a request for authorization of direct take of CRLF that is for a stand-alone purpose of allowing the City to drain the lagoon's fringing wetlands so golf can be played in wetland portions of the golf course in winter, and not a valid recovery purpose. This is an extraordinary precedent for "incidental" take authorization (and precedent for mitigation of CRLF impacts) that appears to be inconsistent with the recovery plan of the species. It is a particularly problematic "incidental take minimization" request because it is made in the absence of any assessment of feasible alternate actions to avoid mass stranding of egg masses due to rapid wetland drainage and drawdown.

The proposal to "minimize" incidental take by instituting a program of annual egg mass translocation in perpetuity with USFWS authorization is essentially unenforceable in the absence of any criteria for receptor habitat selection, or proposed quantitative monitoring and reporting of

- egg survivorship following translocation,
- tadpole recruitment and survivorship following translocation
- "control" (reference) group egg survivorship and tadpole recruitment
- estimated carrying capacity of receptor habitat,
- within-year and long-term populations trends
- water surface elevation thresholds and drawdown rates

The BA is essentially proposing a permanent policy of CRLF egg mass translocation without even minimum monitoring to provide the Service with a reasonable basis for evaluating its efficacy at minimizing take, or causing long-term decline of the CRLF population. This is inconsistent with the monitoring recommendations of the CRLF recovery plan, and is an unreasonable and scientifically invalid approach for take minimization.

2.4 Proposed gopher management impacts and "take" of SFGS and CRLF.

The BA proposes to set gopher traps and reduce gopher abundance in uplands bordering Laguna Salada. The BA fails to identify the risk of incidental "take" of SFGS or CRLF due to gopher traps, or *provide any measures for monitoring or minimizing potential take due to traps*. The recovery plans for both listed species, as well as the SFRPD's own supporting documents cited in the BA identify small mammal burrows as potential important foraging habitat for SFGS, and potential moisture refuges for their amphibian prey species (tree frogs and CRLF). The BA appears to provide insufficient information to support the BO's effects analysis of the risk of incidental "take" of SFGS or CRLF due to gopher burrow destruction or suppression. The BA provides no support to the BO regarding meaningful monitoring or assessment of either take or impacts of gopher suppression on listed species.

2.5 "Survey" methods based on disturbance of endangered species and habitat: "take" equivalent of hazing and habitat degradation activities proposed as survey method.

The BA's so-called "take minimization" measure at 2.3.8 proposes to "survey" for SFGS and CRLF in uplands bordering Horse Stable Pond by *mowing vegetation to a height of 4 inches*, reducing cover and exposing listed species to active disturbances and hazards of injury from mowing. Vegetation mowing in presumed occupied habitat of SFGS and CRLF is *not a survey method consistent with either the recovery plans of the two listed species, or take minimization*, and it is not rational: the "survey" method would itself reduce the likelihood of subsequent occurrence of the target species, which itself suggests

the primary and undisclosed purpose of this extraordinary and unwarranted "survey" method. This measure has the appearance of hazing and affirmative habitat degradation rationalized as monitoring.

2.6 The BA fails to assess any reasonable alternatives with less adverse cumulative impact and "take" of endangered species.

The Service's ESA regulations at Section 402.12(f) (recommended contents of biological assessment) advise that the BA contain "results of on-site inspection, 2 views of recognized experts on species at issue, 3. Review of the literature and other information...4. analysis of effects of the action, including cumulative effects" and "5. An analysis of alternate actions considered by the Federal agency for the proposed action." The BA contains no discussion of any alternatives whatsoever. It arbitrarily excludes the most recent and comprehensive scientific assessment of Laguna Salada's wetland ecology, historical ecology, hydrology, coastal processes, and endangered species biology (ESA-PWA 2011) that identifies both short-term and long-term alternative actions that substantially reduce take and adverse impacts to listed species, and promotes their recovery. A copy of this report is included as an attachment.

The ESA-PWA report (2011) includes views of a recognized expert on CRLF ecology in coastal brackish lagoons of the San Mateo-Santa Cruz coast, Dawn Reis. The failure to provide the ESA-PWA report (2011) findings on alternatives and cumulative impacts to endangered species habitats is apparently inconsistent with the ESA statutory standard of utilizing the "best available commercial and scientific data" to support the endangered species consultation process. The ESA-PWA 2011 report was supplied directly to the SFRPD and most of its principal findings were presented in an invited oral presentation to City representatives, including one co-author of the BA in November 2010.

The interim (phased) restoration measures proposed by ESA-PWA et al. (2011) that were ignored by the BA are simple and feasible, and directly address the primary hydrological impairment of ecological function specific to CRLF and SFGS habitat. They do not

depend on dredging of anoxic sediments or perpetual manual translocation of CRLF egg masses each breeding season. The interim (near-term, prior to long-term ecosystem restoration adapting habitats of listed species for climate change resilience) feasible restoration measures recommended are simply:

- *cessation of mowing emergent perennial fresh-brackish marsh on the landward shore of the lagoon (ending conversion of marsh to turf, marsh encroachment by mowing);*
- *leaving an adequate upland buffer of transition zone (seasonal wetland) vegetation above the former mown marsh;*
- *allowing seasonal shallow flooding of the upper (currently mown) marsh and relatively flat topography of the transition zone, so that rapid pumping does not draw down suitable seasonal wetland pools and strand egg masses there.*

The SFRPD's own hydrology report (KHE 2009) confirms that there are sufficient freshwater inflows to Laguna Salada to fill its ponds even in dry years. Accommodating seasonal wetland pools and CRLF breeding in this zone would not require actual flooding of actual uplands. It would require flooding only within wetlands that are mown to function as turfgrass (seasonal wetlands located within the annual floodplain of the lagoon), to flood; see items 3.2, 3.2 of this report, below. In effect, this alternative measure simply requires that the applicant cease mowing and draining existing wetlands that are seasonally occupied by CRLF and used as breeding habitat. The BA's suggestion that "flooding of uplands" is occurring routinely is flatly incorrect, and contradicts own statement (BA section 2.2.1) that "Portions of the golf cart paths along the eastern side of LS regularly flood, even during drought years." This is because the seasonally flooded areas are not uplands, but in fact *wetlands with perennial marsh habitat that is mown down to function as golf turf* – misleadingly called "uplands" (see item 3.2 below).

3.0. General critical review of the BA

3.1 Failure to disclose long-term consequences of the basic hydrologic management (pumping) regime on listed species. The BA proposals constitute a short-term

infeasible "fix" based on its inaccurate and apparently biased diagnostic assessment of wetland degradation that ignores the *primary causes* of long-term and short-term endangered species/wetland habitat degradation. The *primary causes* of endangered species habitat decline at Laguna Salada are the direct, indirect, and cumulative effects of artificial hydrologic management (pumping regime) that the BA proposals support and continue in perpetuity, without which the BA proposals would have no independent justification.

The artificial water management regime at Laguna Salada *maintains the depressed wetland elevation range at precariously low elevations* (perennial marsh below +8 NAVD), making them artificially vulnerable to cumulative effects of sea level rise, and submergence with seawater during extreme storm overwash events like 1982-83 El Niño event. Contrary to the claims of SFRPD (Tetra Tech et al. 2009, Swaim 2008), the pump-induced drawdown of the lagoon and "seawall" do not protect the lagoon wetlands from catastrophic seawater flooding impacts; on the contrary, they *prevent* the wetlands from rising to naturally higher elevation ranges and locations that would adjust them to rising sea levels, and buffer them and make them *safer* from the effects of storm surges and overwash flooding (ESA-PWA et al. 2011). The artificially low lagoon maintains the habitat of CRLF and SFGS at depressed topographic positions that are *most vulnerable* to complete submergence by marine overwash impounded by the earthen berm, which lacks any potential natural (gravity-drained) sand outlet. In natural backbarrier fresh-brackish lagoons, barrier beaches impound lagoon water surface elevations *above* tides, and raise marsh elevations *above* reach of normal wave runup. The artificial water management regime at Laguna Salada prevents the lagoon from naturally impounding its freshwater discharges and raising marsh elevations above tide and overwash elevation range.

The ongoing pumping regime also prevents *normal, naturally higher seasonal (winter) lagoon water surface elevations* from forming and *maintaining* seasonal pools at the margins of the lagoon's wetlands, suitable for CRLF breeding. The water management regime at Laguna Salada also facilitates saltwater seepage (saline groundwater inflows)

from the sandy (permeable) barrier beach as sea level rises. This hydrologic regime is not sustainable for long-term survival of CRLF and its predator, SFGS.

The BA proposal *maximizes* impacts of artificial wetland drainage (and mowing; see 3.2 below) to degrade eliminate seasonal wetland breeding habitat and *preclude* breeding in natural peripheral seasonal wetlands of the lagoon ecosystem, as a method of "avoiding" take of CRLF eggs and tadpoles. This is an apparent contradiction: The BA proposes extensive "take" (draining of whole seasonal wetland pools along the landward (eastern) upland edge that routinely attract egg mass deposition, and which would otherwise persist *but for* pumping and artificial drainage) in order to "minimize incidental take" of individual egg masses. More significantly, these seasonal breeding pools are located at the *landward*, most naturally freshwater-influenced (least saline) end of the wetland complex, and farthest from influence of rare storm overwash and seawater flooding. In other words, the current regime drains the most defensible long-term CRLF breeding habitat locations that could survive sea level rise and increased storm overwash of the 21st century. Breeding habitats along the back of the barrier beach (seaward end of the wetland complex) are inherently vulnerable to increased risk of overwash and salinity intrusion as sea level rises. Inevitable "coastal squeeze" due to sea level rise puts a long-term conservation premium on the breeding habitat locations on the landward end of the lagoon wetland system. HSP, in contrast, is in a precarious long-term position directly behind the beach, right where it naturally breached even in the 19th century (ESA-PWA et al. 2011).

The essential features of the proposal are to excavate a canal to more rapidly and efficiently drain Laguna Salada into the pumping basin/forebay called Horse Stable Pond, and operate pumps to drain seasonal wetland pools so rapidly that they minimize opportunities for egg deposition. This does not appear to be "incidental" take: the primary purpose of the drainage is to preclude formation of normal seasonal (winter) breeding pools in regularly flooded wetlands. This appears to constitute direct take rather than incidental take: it deliberately and actively degrades seasonal wetland pools (potential

suitable breeding habitat) as though they were inherently "attractive nuisance" habitat, instead of suitable wetland habitat deliberately drained and mown to exclude frog breeding in areas desired for golf recreation activities.

The BA appears to rationalize ecological "enhancement" purposes for activities that are essentially engineering proposals in support of recreational golf and pump maintenance. The BA invokes non-existent causes of environmental degradation without any evidence, such as "soil deposition from the uplands...entering the waterway" (the site is surrounded by sand beach deposits and wetland soil and has a continuously vegetated border) to justify features such as a retaining wall in endangered species habitat. See also discussion of (lack of evidence of) terrestrial sediment deposition in item 2.2 above.

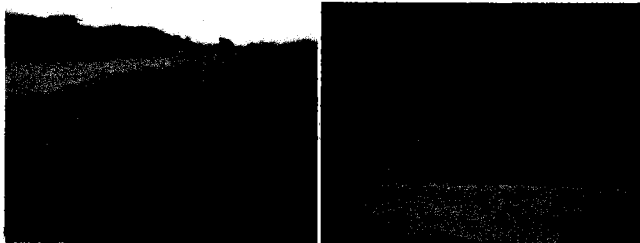
The BA also rationalizes erroneous and misleading ecological causes of endangered species habitat degradation to justify marsh dredging instead of beneficial water level and hydroperiod management to avoid take of CRLF egg masses. The BA (following Tetra Tech et al. 2009 and Swaim 2008) fails to provide any rational argument or evidence for the causes of excessive marsh vegetation growth that it invokes (again, without evidence) as the leading limiting factor for CRLF reproductive success at Laguna Salada. See item 2.2 above (Bayside marsh comparison). The BA ignores all local data on hydroperiods, topography and water depths that clearly show that the pumping regime maintains Laguna Salada at permanently low levels with shallow (subcritical) water depths within the flooding tolerance of tules and cattails across most of the lagoon bed. The BA ignores water quality data showing relatively nutrient-enriched (total nitrogen; the typical limiting nutrient for marsh primary production) eutrophic condition, including nitrate levels that are within effects range for red-legged frog tadpole adverse impacts (ESA-PWA et al. 2011). The BA also fails to provide any quantitative data on cumulative nitrogen and phosphorus loads due to golf fertilizer, and instead emphasizes largely irrelevant non-quantitative information about "organic" types of fertilizer use as a "best management practice". The BA completely fails to assess the relationship between shallow marginal water depths maintained by pumping to maximize golf turfgrass area,

and the aggressive encroachment of the former bed of Laguna Salada by *Salicornia* spp., tules and cattails.

3.2. Failure to disclose or assess mowing of fresh-brackish marsh to provide extension of functional turfgrass area.

The BA fails to disclose the extent and ecological (vegetation) zone in which routine mowing occurs. Mowing clearly extends into saturated soils dominated by obligate and facultative-wet dominated vegetation identical with the adjacent marsh (ESA-PWA et al. 2011). The golf course mows marsh vegetation to the height of turf and drains it, converting it seasonally to functional turf composed of marsh vegetation. This marsh vegetation (coast bulrush, silverweed, bentgrass) mowed is seasonally submerged and is otherwise suitable habitat for CRLF and SFGS. The BA does not assess the effects on loss of cover, the relationship of the mowed marsh zone and water surface elevation in winter (during CRLF breeding) or the effect mowing has on location of egg mass deposition. The BA-proposed "no mow" zone discussion does not address the marsh mowing issue. These are critical omissions.





Marsh mowing: golf maintenance impacts. The golf turf mowing encroaches marsh at the northeast end of Laguna Salada, extending directly into perennial fresh-brackish marsh and riparian woodland zones. The apparent golf turf is composed of the same fresh-brackish marsh species shown at the left, *Scheuchzeria palustris*, *Potentilla anserina*, *Agrostis stolonifera*, and *Catula coronopifolia*. The seasonally flooded outer marsh and its terrestrial ecotone are replaced by turf even with pumped drawdown of the lagoon. The natural floodplain (unimpaired maximum lagoon elevations) would include a much wider floodplain area. All wildlife cover is eliminated, exposing travel corridors of SF Garter snakes and eliminating suitable mammal burrow foraging habitats. All potential buffers for fertilizer impacts are eliminated by encroachment of golf turf into the marsh. Above: June 10, 2010. Below: August 3, 2010.

3.3. Misleading representation of seasonally flooded wetlands as "flooded uplands" to be drained.


The BA's account of the "normal wetland hydrology", even in drought years, includes inconsistent and inaccurate reference to "floodwaters" in seasonal wetlands. Areas that are repeatedly flooded even in drought years (as well as in summer dry seasons!) enough to sustain CRLF egg deposition are clearly not "uplands" in any biologically meaningful way, in context of Section 7 consultation. The lowland zones bordering the emergent Laguna Salada marsh that are artificially drained and mown to function as golf turfgrass are seasonal and perennial wetlands. The so-called "uplands" are mown encroachments of marsh (see 3.2 above).

3.4. Sediment chemistry and dredging/post-dredging impacts.

The BA does not identify the nature of the sediments it proposes to dredge in occupied endangered species habitat, including the larval life-history stages of CRLF that cannot

escape the water column. The BA presents no monitoring data on sediment quality, water quality, or CRLF impacts from previous dredging episodes at HSP, and thus provides the BO with no information to support an analysis of direct, indirect, or cumulative effects. The BA does not identify or assess potential impacts of suspended anoxic, sulfidic sediment from the warm brackish (sulfide-rich) bed of Laguna Salada, even though these readily detected (rotten egg scent of sulfides; jet-black ferrous sulfide) sediments are widespread in organic-rich muck in marsh and open water lagoon bottom sediments. The BA proposes no measures to contain anoxic suspended sediment plumes or minimize hypoxia effects in a small, closed basin in which CRLF tadpoles must be presumed to be present. The BA fails to identify any potential refuges for CRLF tadpoles affected by a hypoxia event due to dredging suspended sediment plumes. Similarly, the BA does not evaluate any other predictable water and sediment chemistry changes associated with dredging anoxic organic sediments, such as ammonia pulses, post-aeration nitrate pulses, and formation of acid sulfates. The BA proposes to place sulfidic sediments in uplands presumed occupied by CRLF and SFGS, where they should be expected to form acid sulfates. The lack of sediment testing as a basic, standard component of wetland dredging is not explained in the BA.





Iron oxide surface films and iron sulfide accumulation of muds exposed by artificial lagoon drawdown. Iron oxide (orange-brown mineral films indicative of oxidation of iron sulfide and acid sulfates in brackish coastal sediments subject to alternating strong hypoxia and oxidation) are apparent in drawdown-emergent muds at the northeast end of Laguna Salada. Organic-rich sediment immediately below the iron oxide-stained surface sediment film is deep black (lower left), indicative of toxic iron sulfide, formed under strong hypoxic bottom conditions, exposed at the marsh surface by artificial drawdown of the lagoon.

3.5. Origin and types of pre-golf Laguna Salada wetlands: misleading and inaccurate account of golf course creation of freshwater marsh habitat for CRLF and SFGS.

The BA, relying in the 2009 SFRPD Sharp Park Alternatives Report (Tetra Tech 2009), uncritically adopts the unsupported and unsound assumption that the original condition of Laguna Salada was a homogenous saline lagoon unsuitable as habitat for the California red-legged frog and San Francisco Garter snake (BA section 3.1), rather than the typical fresh-brackish lagoon wetland gradients that prevail even today along the coast of San Mateo, Santa Cruz, and Marin Counties. This fallacy appears to originate with the (now obsolete) 1992 PWA report (ESA-PWA et al. 2011), which inferred a saline lagoon merely from the folk-name "Salada", indicating some degree of at least brackish salinity; there was no evidence or historical ecology analysis in the 1992 PWA report or the 2009 Tetra Tech report that supported the conclusion that the pre-golf condition of the lagoon, or the pre-European "natural" condition of the lagoon was a saline nontidal or tidal (marine salinity) lagoon. There is strong direct local historical evidence (herbarium records, historical photographs and maps) that the pre-golf lagoon wetlands ranged from fresh-brackish (oligohaline) to brackish, like most seasonally or intermittently non-tidal

coastal lagoons of the Central Coast region that support populations of California red-legged frogs and garter snakes (including SFGS) at the landward (inland) ends of their wetland gradients today.

The strongest and most direct local evidence of the pre-golf salinity regime and vegetation at the landward end of Laguna Salada prior to golf construction is a ground-level historical photograph taken during the agricultural land use phase, dated approximately in 1928. This photograph appears in the 2011 PWA report appendix on historical ecology of Laguna Salada (ESA-PWA et al. 2011, Appendix A, Figure A-1), and is also publicly featured as part of a natural interpretive display sign erected on Mori Point by the National Parks Service. The photograph shows clearly identifiable prevalence of marsh plant species that are physiologically intolerant of marine salinity to brackish salinity (polyhaline conditions) – specifically, California tule, cattails, and bulrushes – the same relatively salt-intolerant perennial marsh plant species that are dominant today along Laguna Salada. The open water appears to be covered by floating mats of sago pondweed, a fresh-brackish submerged vascular plant typically associated with salinity regimes supporting tule-cattail-bulrush marsh. California red-legged frogs use sago pondweed stands as breeding habitat at Laguna Creek Lagoon in Santa Cruz. The tule-cattail-bulrush marsh assemblage in the pre-golf photo essentially the same as the typical vegetation bordering most California red-legged frog breeding habitat sites in other coastal lagoons in the region. Other freshwater marsh species intolerant of even moderately brackish salinity at Laguna Salada appear in early 20th century herbarium collections. Exhibit A, p. 85 (ESA-PWA 2011 et al. Appendix A, Table A-1).

There is no evidence of any salt marsh plant species in the circa 1928 photograph of pre-golf Laguna Salada at the landward lagoon shore location. The lack of salt marsh vegetation is particularly significant because other aerial and ground photographs of Laguna Salada from the 1920s and earlier show that artificial breach canals were cut through the beach, apparently to drain the lagoon at low tide, so that the lagoon would act as a sump for agricultural drainage of flood-prone lowland croplands of the adjacent

valley. Artificial breaching of the barrier beach during the growing season would allow seawater to enter the lagoon before wave action sealed the artificial, unstable breach with sand. Even with artificial breaching to increase growing-season seawater influxes to the lagoon, the landward edge of the lagoon is dominated with cattail, tule, and bulrush marsh vegetation that indicates prevalent fresh-brackish (oligohaline) rather than saline (polyhaline to euhaline) conditions in the landward fringing marshes of the lagoon in the long-term.

The folk-name "Laguna Salada" indicates only that the aqueous salinity of the lagoon was sufficiently brackish (for potable or agricultural irrigation water, readily detectable by taste above 2 parts per thousand salt concentration) to be distinguished from predominantly freshwater lagoons with no appreciable salinity (less than 2 ppt). Botanists and geographers in the 19th century, like authors of place-names, did not make the distinction between "brackish" (a term that was brought into widespread scientific descriptive use in the 20th century) and "saline". Other early historical place-names suggest that salinity-descriptive nomenclature like "Freshwater Bay" used by early navigators of Suisun Bay (actually estuarine: brackish in summer, nearly fresh in winter, contrasting with saline San Francisco Bay) reflected seasonal (like "Arroyo Seco", dry creek) rather than permanent salinity or hydrological regimes, as well as contrasts with nearby waterbodies. Thus, a naïve literal interpretation of "Laguna Salada" as "Saline Lake" is inconsistent with early maps, early 20th century photos prior to golf construction. (ESA-PWA 2011 Appendix F).

Equally naïve and unsupported by historical and scientific evidence is the popular belief (repeated uncritically by some environmental professionals) that golf course construction "created" the fresh-brackish lagoon wetlands at Laguna Salada. There is no evidence from aerial photos that golf construction contributed additional marine overwash flood protection structures to Laguna Salada's natural barrier beach, and certainly not beyond any minor changes that may have been inherited from the agricultural land use era.

Fresh-brackish vegetation is typical of the landward edges of central California coastal lagoons where freshwater stream deltas slightly above high tide elevations intergrade with lagoon fringing wetlands. This is exactly the structure represented in the mid-19th century U.S. Coast Survey map of Laguna Salada: the marsh map symbol is restricted to the southwest corner of the lagoon where three small channels, oriented like marsh distributary channels of the freshwater Sanchez Creek, intersect the marsh. (ESA-PWA et al. 2011, Figure A-11). The three distributary channels are shown as artificially channelized seasonal arroyos (freshwater seasonal creek) in the 1897 U.S. Geological Survey map of Laguna Salada. The 19th and 20th century US Coast Survey and subsequent U.S. Geological Survey maps all represent Laguna Salada as a closed lagoon with no open tidal inlet to sustain high salinity. This is consistent with other coastal lagoons with full exposure to Pacific swell and exhibit mostly ephemeral outlets for freshwater overflowing from the lagoon side of the barrier beach – not tidal inlets. Analysis of wave power and lagoon discharge (potential tidal prism or water volume) relationships (ESA-PWA et al. 2011) confirms that tidal inlets would be inherently unstable and prone to closure Laguna Salada.

Salt marshes and saline coastal lagoons in northern and central California are associated with the seaward ends of lagoons with at least seasonally stable tidal inlets. All other coastal stream mouth lagoons south and north of Laguna Salada in Marin to Santa Cruz counties exhibit fresh-brackish marsh or freshwater-dependent riparian woodland at their landward ends, in both modern and historical conditions. Many of these lagoons also support persistent populations of California red-legged frogs in the fresh-brackish landward portions of lagoon wetland gradients

4.0. Section-by-section critical review of the BA.

Sections of the BA discussed are shown in italics. Bullets indicate relevant BA text.

1.1 DOCUMENT PURPOSE

- Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project.

Project name and description do not explain "safety improvement", and do not disclose the essential compensatory mitigation purpose of the "habitat enhancements" enabling wetland drainage to be sufficient to maintain the existing lowest elevations of the golf course to encroach into wetlands that are seasonally flooded. If the basic purpose is habitat enhancement, then a range of alternatives that optimize hydrology and water quality for listed wetland-dependent species should have been included, not just dredging and existing water levels.

- "This BA has been prepared in conformance with Final Rule regarding Interagency Cooperation (50 CFR pt. 402)"

The BA was not prepared by the lead federal action agency (USACE), but by the applicant, and without any reference to designation of a non-federal representative for informal consultation or a biological assessment (50 CFR Sect. 402.08). This omission suggests that the BA fails to comply with 50 CFR Part 402. The lead agency (USACE) would need to have reviewed and supervised the BA as well as designate the applicant and consultants as non-federal representatives to comply with the Interagency Cooperation regulations of ESA.

1.2 LISTED SPECIES CONSIDERED

- "No other listed or proposed species have the potential to occur on the Project site."

This statement appears to be incorrect. Since Caspian and Forsters terns forage on fish in LS, and since CA Least Terns rangewide occupy barrier beaches and lagoons, there is potential (though not likely) for occurrence of CA least terns at Laguna Salada. CLT have colonized even less typical artificial oligohaline (near-freshwater) sand/lagoon habitats remote from their primary maritime distribution at Montezuma Wetlands, at the lower Sacramento River. The BA cites no bird data from Sharp Park to determine whether CLT occur there as vagrants or seasonal users.

1.4 PREVIOUS CONSULTATIONS

- "Biological Opinion for the Pacifica Recycled Water Project (81420-2008-1-1643), This project, which will provide recycled water to Sharp Park, was determined to have potential direct and indirect effects on CRLF and SFGS."

This consultation appears not to have considered the cumulative impact of wastewater nutrient loading cumulative impacts with annual total golf fertilizer nutrient loads on Laguna Salada (both water quality for CRLF tadpoles and indirect effects on habitat through vegetation growth and structure), and the BA fails to supplement it with any quantitative analysis. The current consultation's effects analysis would need basic data on the total nutrient (primarily total N, P) loads from (a) recycled water inflows, (b) total annual golf course fertilizer load, and (c) watershed nutrient load in order to estimate

cumulative impacts of eutrophication on marsh vegetation (habitat of CRLF) and direct water quality (nitrate, ammonia) impacts on CRLF tadpoles. See ESA-PWA et al. 2011.

2.1 PROJECT LOCATION

The description of project location omits essential and relevant information on the coastal backbarrier setting of the lagoon, its adjacency to three constructed freshwater GGNRA ponds/fringing marsh at S edge of Laguna Salada (inhabited by CRLF breeding and foraging habitat; SFGS detected present). The description lacks essential contextual information relevant to endangered species, such as surrounding habitats, land uses, distance to nearest potential CRLF and SFGS populations (isolation, potential for recolonization after population crash or extirpation). The setting is not described until 2.2.2.2, where key relevant information about habitat sustainability is omitted, such as drainage of lagoon below wave runup elevations and high tidal elevations)

2.2 PROJECT DESCRIPTION

- "The wetlands complex is composed of Laguna Salada (LS), Horse Stable Pond (HSP), a channel that connects the two water bodies, and adjacent wetlands. A seawall on the western boundary of Sharp Park eliminated the historic hydrologic connection between the Pacific Ocean and the wetlands..."

This is an inaccurate geographic description. All wetlands at Sharp Park occur *within the bed of historic Laguna Salada*; they are the drained lagoon bed, not separate distinct wetlands (ESA-PWA et al. 2011). Horse Stable Pond is the historic outlet channel of Laguna Salada (recurrent natural breach location allowing outflows of impounded freshwater) (ESA-PWA et al. 2011). "Channel" is artificial ditch completely infilled with tule & cattail. The "seawall" is not a structural seawall, but an *earthen berm* with partial boulder armor perched on the original natural barrier (sand) beach. *There is no seawall structure or foundation*. The "seawall" does not eliminate all hydrologic connection between Pacific Ocean and LS: it restricts only *surface* flows (overwash and ephemeral outflows, temporary storm breaches) but is no barrier to groundwater exchange from beach to lagoon, and saline subsurface seeps are evident in both the western golf course and the west shore of the lagoon (KHE 2009, ESA-PWA et al. 2009). This indicates the long-term potential for salinization of the lagoon as sea level rises even if the earthen berm remains intact, as long as lagoon levels are kept below beach groundwater elevations (set up by wave runup "pumping" seawater above tide elevations; (ESA-PWA et al. 2011)).

- "wetlands are believed to be maintained by *ground water* but are *also* fed by surface water inflow due to precipitation in the winter."

This BA statement is incorrect and inconsistent with the project's own hydrology report (KHE 2009, not cited in BA), which states that winter *surface flows* are the primary water source for Laguna Salada, and are drained away by the pumps:

Surface water inflows associated with winter storm events provide the primary source of water to the wetland system... Drainage from and water levels in the Laguna Salada wetlands are presently maintained by the operation of a pumping station located at the southern extent of Horse Stable Pond.... Drainage from and water levels in the Laguna Salada wetlands are presently maintained by the operation of a pumping station located at the southern extent of Horse Stable Pond. The pumping station contains two pumps; a large pump with a flow capacity of 10,000 gallons per minute (GPM) and a smaller pump with a flow capacity of 1,500 GPM... (KHE 2009 p. 4-5; emphasis added)

KHE states merely that groundwater contributes to the lagoon because inflows exceed outflows. Groundwater sources include saline groundwater from the beach (KHE 2009). The lagoon is maintained by channelized surface inflows of fresh water; supplemental groundwater is subordinate:

Groundwater inflow exceeds groundwater outflow (seepage); as a result, groundwater inflows contribute to the overall water budget of the system. As a result of groundwater contributions, dry season water level recession occurs at a slightly slower rate than would be expected due to evapotranspiration losses alone.

- "Operation of the flood control pump system is necessary to manage floodwaters both on the Property and on adjacent properties. During normal rainfall years, floodwaters into Laguna Salada back up onto the golf course path." ... "Portions of the golf cart paths along the eastern side of LS regularly flood, even during drought years."

"Normal rainfall" filling of lagoon by definition is not "floodwater". Normal means normal re-occupation of the drained lagoon to normal levels; it's the mowing of marsh to function as turfgrass (see items 3.2, 3.3 above) that give the false and paradoxical appearance of "normal" and even dry-year flooding. The description inverts the nature of the wetlands, uplands, and flooding. Drought-year flooding is an oxymoron, and clear evidence of wetland topography and hydrology. Drainage of lagoon not necessary to protect adjacent properties, which can be protected by a separate small berm (ESA-PWA et al. 2011).

2.2.1 Construction Action

- "Currently, two factors adversely affect the operation of the pumps. First, pump operation is adversely affected by sediment buildup and vegetation growth around the pump intake structure and along the connecting channel between LS and HSP. Second, pump operation is adversely affected by the buildup of vegetation on the pump intake screens."

There is no "vegetation growth" obstructing screens or around the pump intake. See cover photo of this report (2010). There is a narrow fringe of coast bulrush on the uppers

shoreline west of the pump intake, and tules many meters away; the forebay in front of the pump is all open water. Neither the BA nor the Tetra Tech et al. 2009 report provide any objective or quantitative evidence of sediment "buildup" – no elevation information or sedimentation rate data. The SFRPD hydrology report (KHE 2009) does not report sediment accumulation as a factor adversely affecting pumps. There are no sources of sediment inputs and no sediment budget, nor is there any evidence of surface sediment accretion. The fringing marsh vegetation (tule, cattail, saltgrass) occurs more than 5 m away from the screens, and can be managed without dredging (cutting below mud level). Debris accumulation (plant litter) is not controlled by dredging.

- "...removal of sediments and emergent vegetation within the HSP wetland near the intake structure in order to reduce obstructions to water flow to the pump intake and to enhance breeding habitat for the CRLF." Approximately 2,350 square feet (0.05 acres) of this 5,900 square foot area is occupied by cattails and bulrush; the remaining area is open water.... Removal of sediment and emergent vegetation that impedes water flow and reduces habitat suitability for CRLF in select locations..."

The BA fails to provide any evidence or analysis for the project's claimed purpose of "enhancement" of existing open water and fringing tule-cattail marsh habitat of CRLF or SFGS. There is not even facial evidence for "reduced habitat suitability" of nearly 50% open water area at HSP (photo). HSP has the highest measured egg mass deposition frequency of LS reported by Swaim (2008). "Bulrush" in HSP is tule, (*Schoenoplectus californicus*), not bulrush (*Schoenoplectus pungens*).

- "...installation of steps leading down the slope from the access road to the pumphouse and the intake structure (approximately 47 square feet or 0.001 acres). A fence with a locking gate will restrict access to the steps and boardwalk."

The steps may improve terrestrial predator access (raccoons and feral cats not deterred by fence) to CRLF habitat, but impacts are not assessed.

- "Replacement of the failing wooden retaining wall next to the pumphouse (at the base of the levee slope between the uplands and the wetland) with a concrete retaining wall to prevent further soil deposition from the uplands from entering the waterway."

There is no evidence for any "soil deposition from the uplands" of the adjacent levee or slope fills, which are entirely vegetated. The marsh surface is composed of fine-grained sulfidic and organic muck (autochthonous, accreted in situ), not alluvium eroded from adjacent upland slopes. The BA provides no evidence of erosion or deposition at the pumphouse (no evidence from on-site inspection, recommended for BA in 50 CFR 402.12). The purpose of a concrete retaining wall cannot reasonably be justified by erosion or habitat enhancement.

- "Excavation of sediments and vegetation will be conducted from the golf course uplands wherever possible, thus minimizing impacts to the wetlands. The sediment and vegetation removal along the connecting channel between HSP and LS can be accomplished with little or no impact to the adjacent wetland. ... sediment and vegetation removal from HSP would be to use a compact multi-purpose aquatic vessel (i.e., an Aquamog) or similar equipment with long boom and clam shell or bucket type attachment... will be placed in an elevated dewatering container located in an adjacent cleared upland or placed directly into a dump truck and hauled to either the organic dump or reclaimed rifle range east of the PCH"

See BA comments at 3.4 (dredging impacts). No locations are shown for "cleared upland" in what is presumed SFGS habitat; no impacts assessed. This is potential "take".

2.2.2 Golf Course Maintenance and Operations

- "The SFRPD currently employs seven staff members who perform the year-round operation and maintenance) of the golf course. These activities include mowing; application of water for irrigation; application of fertilizers"

See BA comments on mowing in marsh and fertilizer impacts (and lack of quantification of cumulative lagoon nutrient loading (lb/area/yr, total area = nutrient load) and fertilizer composition (N, P). See ESA-PWA et al. 2011.

2.2.2.3 Integrated Pest Management

- Today, only organic fertilizers are used at Sharp Park...

Misleading and irrelevant to nutrient loading quantification. BA fails to provide quantification of annual nutrient load from fertilizer. "Organic" nutrient (N, P) pollution of LS is no different from non-organic; eutrophication depends on rate of nutrient loading, not "organic" label.

- Gophers are common on golf courses. Gopher mounds may damage mowers, and gophers can damage turf roots as well as other plants. SFRPD staff manage gopher populations by raking down gopher mounds. Mounds are raked away from the opening of the hole. If an active burrow is present on the fairway, greens, tees or roughs, traps may be set by removing a clump of dirt from the ground such that the middle of a main tunnel is exposed. A U-shaped wire sprung gopher trap (MacAbee trap) is placed in the burrow on either side of the hole. The access hole is then immediately filled in with the clump of turf that had been removed. Typically the traps are checked and removed before the end of the work day.

See BA comment at 2.4. Traps = snake take risk; no take minimization proposed. Raking mounds does not "manage" gopher population. gopher burrows = aeration and moisture refuge habitat for tree frog (prey of SFGS), CRLF. Suppression of mammal burrows in adjacent uplands is impact to habitat potential impact to SFGS and CRLF.

2.2.3 Natural Areas Restoration

- "...these areas are to be managed and restored for their biodiversity. Maintenance activities, such as hand removal of vegetation within and adjacent to HSP, LS and the connecting channel, contribute to the preservation and enhancement of habitat for the species."

This is a key area of dispute that should be resolved in the biological opinion's analysis of cumulative effects including interrelated and interdependent actions: *dredging does not address the larger issue of permanent drainage and mowing impacts of the lagoon*. The characterization of dredging openings in drained marsh so the lagoon can be drained low enough to allow golf mowing in wetlands is doubtful "enhancement" of endangered species wetland habitat. See BA comments at 3.1, 3.3, 3.4, etc.

- "The activities would include the removal of vegetation overhanging and shading the wetlands such as acacia, Monterey cypress, as well as vegetation within the wetlands such as cattails and bulrush that reduce the quality of CRLF breeding habitat and therefore reduce prey availability and foraging habitat quality for SFGS. In areas where appropriate, native plants and erosion control measures would be installed to replace and augment the wildlife habitat and reduce soil loss."

Cattail and bulrush overgrowth is due primarily to pumping and water depth reduction to less than 4 ft all year round over most of the lagoon bed (most of fringing marsh occupies water depth less than 3 ft deep), and stabilization of water level. This is a basic flaw in analysis of causes of habitat decline. There is no evidence of "soil loss" in uplands: the west shore is all sand, and the east and north shore are mown marsh and golf turf; the south end is solid marsh backed by riparian woodland (willow grove).

2.3 MINIMIZATION AND MITIGATION MEASURES

Alternate actions (alternatives) are missing from this section, as is any assessment of consistency with recovery objectives and tasks for the two listed species.

- 2.3.5 During dredging and vegetation removal activities, if required, up to three (3) biological monitors will be present to 1) monitor the area of vegetation or sediment removal, 2) observe the material as it transferred to the shoreline and 3) to inspect material as it is loaded into a container/dump bed that will allow the water in the excavated sediment to drain out before removal from the site.

See comments on failure to test sediment prior to dredging or assess dredging impacts, comments at 2.1.

- 2.3.8 Terrestrial vegetation in undisturbed areas around HSP and the connecting channel will be cleared by manual means to a height of 4 inches (or a height that allows visibility of the ground) under the supervision of an approved biological monitor and checked for the presence of CRLF and SPGS.

This "survey" method is in itself a potential source of incidental take, and is not justified or shown to be consistent with recovery plan survey methodology or USFWS approved protocols. Mowing/clearing vegetation is a source of habitat degradation (loss of cover).

- 2.3.13 Erosion control best management practices (silt fences, coir rolls, straw bales) would be employed as part of the dewatering of sediments after removal and while soils are exposed. The erosion control measures will not include netting, plastic or natural monofilament netting or other materials that may entrap frogs or snakes.

There is no evidence for any "soil deposition from the uplands" of the adjacent levee or slope fills, which are entirely vegetated. The marsh surface is composed of fine-grained sulfidic and organic muck (autochthonous, accreted in situ), not alluvium eroded from adjacent upland slopes. The BA provides no evidence of erosion or deposition at the pumphouse. There is no description of location of sediment dewatering of potential acid sulfate (oxidized sulfidic) sediment.

- 2.3.16 During and following completion of the Project, the water pumps will be operated pursuant to the following criteria: Appropriate water levels will be determined by conducting visual surveys of CRLF egg masses in potential habitat areas around HSP, LS and the connecting channel. During the visual surveys, data on the CRLF egg masses including attachment type, water depth, size of egg mass, and Gosner stage will be taken, and a determination of potential stranding will also be made.

It is not feasible to determine "appropriate water levels" without measuring surface and water elevations at locations at issue; subjective "data" of visual surveys are not verifiable or reportable and cannot support data interpretation.

- Pump levels will be set relative to the CRLF egg mass with the least amount of water around it; in other words, the pumps will be set to a level to protect the most vulnerable egg masses in HSP, LS and the connection channel.

This measure is infeasible because water surface elevations differ between HSP (pump location) and Laguna Salada because of friction and slope of water surface (KHE 2009).

There is an inherent spatial lag in water surface drawdown between HSP and LS, and an inherent temporal lag between pump activation/deactivation and water level adjustments. The constraints of "fine-tuning" water levels with the pumps and these lags in relation to the sensitivity of egg mass stranding are not analyzed; it is left to subjective judgment that is not accompanied by quantitative monitoring of water surface elevations, substrate elevations, egg mass attachment elevations, and real time. The BA proposal appears to be both infeasible and unenforceable for this reason.

- Once all the CRLF eggs have hatched and the tadpoles are no longer aggregating about the egg mass, the water level will be lowered incrementally and the dewatering of HSP, LS and the connecting channel is monitored to ensure that CRLF tadpoles are not stranded by receding waters.

This measure to "lower incrementally" water levels does not specify limit on maximum rate of drawdown or pumping; it is not enforceable without it. The constraints of "fine-tuning" water levels with the pumps and these lags in relation to the sensitivity of egg mass stranding are not analyzed; it is left to subjective judgment that is not accompanied by quantitative monitoring of water surface elevations, substrate elevations, egg mass attachment elevations, and real time.

- 2.3.17 During and following completion of the Project, if CRLF egg masses are determined to be at risk because they are deposited in ephemeral swales or in other conditions that are not sustainable, an SFRPD biological monitor with the Natural Areas Program will apprise USFWS of the situation and propose a relocation plan to the USFWS for review and approval. Such a relocation plan will describe....

See BA comments at 2.3. Egg mass translocation annually in perpetuity does not appear to be consistent with CRLF Recovery Plan. No monitoring data, thresholds or performance criteria are proposed; the plan is not even a potentially enforceable take minimization measure (even if consistent with recovery plan) without monitoring and performance criteria.

- 2.3.18 During and following completion of the Project, mowing will occur pursuant to the following criteria: The area to be mowed will be the minimum required to maintain the golf course. A no-mow zone area, which includes the roughs adjacent to the wetlands, will be identified with stakes or other markers on the ground (see Figure 2-5). Golf staff will be instructed not to mow in these areas.

See BA comments at 3.2. This measure fails to provide a minimum buffer around endangered species habitat and allows direct encroachment of mowing into wetlands.

- 2.3.19 During and following completion of the Project, only organic fertilizers, such as pro-biotics, blood meal, lime, and compost tea, will be used at Sharp Park

Misleading and irrelevant to nutrient loading quantification. BA fails to provide quantification of annual nutrient load from fertilizer. "Organic" nutrient (N, P) pollution of LS is no different from non-organic; eutrophication depends on rate of nutrient loading, not "organic" label.

5.3 & 5.4 – [Interrelated and interdependent and cumulative effects]

The effects analysis lacks any meaningful assessment of the long-term consequences of proposed water level management on marsh elevations, salinity intrusion, sea level rise, as they affect of CRLF and SFGS population viability and habitat sustainability (ESA-PWA et al. 2011; see BA comments at 2.0, 3.0).

5.0 Conclusions and recommendations.

The BA appears not to comply with the general ESA standard of providing the "best available scientific and commercial data" regarding the scientific account of ecosystem inhabited by listed species in the project action area. It apparently fails to provide a reasonably complete and accurate scientific assessment of direct, indirect, and cumulative impacts of proposed actions. The BA proposes some very high-risk, potential high impact actions offered as "take minimization" measures that commit serious omissions of basic data – particularly (a) dredge sediment testing data for sulfidic, anoxic (ecotoxic) brackish marsh sediments, and potential for hypoxia events and subsequent acid sulfate formation, and (b) the permanent CRLF egg translocation program that appears to conflict with the CRLF recovery plan. The BA is acutely deficient in failing to identify reasonable alternatives (alternate actions of reasonable and prudent measures with less impact and take of listed species), based on comprehensive assessment of the ecosystem. The BA appears to rationalize recreation-priority land and water management activities as benign or even beneficial to listed species, and systematically ignores the fundamental hydrologic threats they impose in the long-term. The BA, therefore, does not appear to provide a sound scientific or regulatory basis on which the formal Section 7 consultation may reasonably rely for scientific analysis of "effects of the action" or formulation of reasonable and prudent measures or alternatives.

I recommend that the deficiencies of the BA be corrected, at least in the final BA and a revised BA, by:

- requiring dredge sediment testing data by independent qualified experts, with a specific assessment of potential ecotoxicity of hypoxic sediment plumes during dredging, and post-dredging water quality for CRLF tadpoles, including mortality risks.
- requiring an analysis of ongoing and proposed long-term water management at Laguna Salada by independent, unbiased qualified experts, with focus on long-term groundwater salinity changes and marsh elevation range in relation to vulnerability to storm overwash flooding, including gradual sea level rise interactions.
- requiring an unbiased analysis of alternative interim and long-term alternate actions, including reasonable modifications of seasonal water levels favorable for CRLF breeding (including any appropriate small-scale hydrologic barriers bordering true upland areas), cessation of mowing marsh vegetation, and creation of adequate upland buffers with suitable vegetation cover and basking sites.
- requiring review and reference to relevant portions of the ESA-PWA report (2001) to satisfy the general ESA statutory standard of "the best scientific and commercially available scientific data".
- (most importantly) providing a rigorous analysis of the feasibility of long-term management of CRLF by a permanent program of egg mass translocation in response to artificial rapid drawdown due to pumping to maintain a fixed range of low lagoon levels, and the consistency of such a program with the approved final recovery plan for CRLF, including possible precedents for future Section 7 consultations based on single-event or perennial CRLF translocation to "minimize" take.

References

KHE (Kamman Hydrology & Engineering, Inc.). 2009. Report for the Hydrologic Assessment and Ecological Enhancement Feasibility Study: Laguna Salada Wetland System Pacifica, California *Prepared For:* Tetra Tech, Inc. San Francisco, California

ESA-PWA (Environmental Science Associates - Philip Williams and Associates) 2011. Conceptual ecosystem restoration plan and feasibility assessment: Laguna Salada, Pacifica, California. Prepared for: Wild Equity Institute. Prepared by: ESA PWA with Peter Baye and Dawn Reis Ecological Studies. 65 pp + appendices

Swaim, K. 2008. Sharp Park wildlife surveys and special reptile and amphibian restoration recommendations. Prepared for Tetra Tech Inc. Portland, OR by Swaim Biological Incorporated Livermore, CA. Appendix C in Tetra Tech 2009.

Tetra Tech, Inc., Swaim Biological, and Nickels Golf Group. 2009. Sharp Park Conceptual Restoration Alternatives. Prepared for San Francisco Recreation and Parks Department. November 2009.

EXHIBIT H

1 UNITED STATES DISTRICT COURT
2 FOR THE NORTHERN DISTRICT OF CALIFORNIA
3 NORTHERN DIVISION

4 WILD EQUITY INSTITUTE, a non-profit
corporation, et al.)

5 Plaintiffs,)

6 v.)

7 CITY AND COUNTY OF SAN
8 FRANCISCO, et al.,)

9 Defendants.)

Case No.: 3:11-CV-00958 SI

DR. MARC HAYES EXPERT REPORT

10 QUALIFICATIONS AND BACKGROUND

11 1. I am submitting this expert report in support of plaintiffs' position in this litigation that
12 activities at the Sharp Park Golf Course ("Sharp Park") are resulting in the "take" of the
13 California Red-legged Frog ("CRLF"; *Rana draytonii*) and the San Francisco Garter Snake
14 ("SFGS"; *Thamnophis sirtalis tetrataenia*), and their position that in the absence of judicial
15 relief such take will continue. I have the requisite credentials to offer expert opinions on these
16 issues, as well as other matters on which I will opine in this expert report.

17 2. For nearly four decades, I have worked professionally as a research and field ecologist
18 and herpetologist, studying reptiles and amphibians in California, Oregon, Washington, Mexico,
19 Costa Rica, and Florida. During this time, I have supervised over 70 projects addressing the
20 ecology and habitat needs of the herpetofauna in these areas, working with the California
21 Department of Fish and Game, the United States Fish and Wildlife Service, the California
22 Academy of Sciences, and diverse other public and private entities. I am a member of the
23 following professional scientific organizations: American Society of Ichthyologists and
24 Herpetologists (life member), The Herpetologist's League (life member), The Wildlife Society
25 (associate member), Society for Northwestern Vertebrate Biology (life member), Society for
26 Conservation Biology (life member), Society for Integrative Biology (life member), Societas
27 Europea Herpetologica (life member), Society for the Study of Amphibians and Reptiles (life
28

1 member), Desert Tortoise Council (life member), and the Association of Zoos and Aquariums
2 (associate member).

3 3. I received my Bachelors degree in biology in 1972 from U.C. Santa Barbara, my
4 Masters in Biological Sciences in 1975 from California State University, Chico, and my PhD in
5 Herpetological Ecology in 1991 from the University of Miami, Florida. Currently I serve as an
6 Adjunct Professor at Central Washington University (Ellensburg, WA), Evergreen State College
7 (Olympia, WA), Portland State University (Portland, OR), and the University of Washington
8 (Seattle, WA). I am also an Affiliate Curator in Herpetology at the Burke Museum at the
9 University of Washington, and I serve as a Senior Research Scientist with the Washington
10 Department of Fish and Wildlife ("WDFW"). In 2010, I received the prestigious *Conservation*
11 *Award* from WDFW—the highest award the department grants—specifically for my work on
12 amphibian conservation. More detailed information about my research can be found in my
13 current curriculum vitae, along with a list of my publications from the past 10 years, which is
14 attached to this report as Exhibit A.

15 4. My research and my field experience have been particularly focused on California's rare
16 and endangered amphibians and reptiles. In 1994, I co-authored a 255-page report for the
17 California Department of Fish and Game ("CDFG") entitled *Amphibians and Reptiles of Special*
18 *Concern in California*. That report, which was a compilation of the status and threats facing all
19 rare amphibians and reptiles in the state, was designed to help CDFG decide which of these
20 species were eligible for protection under state or federal law.

21 5. While researching and writing that report, we discovered that the CRLF was facing
22 severe threats; that it had suffered a marked contraction in its geographic range over the
23 preceding century; and that its remaining populations were at risk due to a suite of factors. Yet it
24 was not protected under federal endangered species law. We therefore submitted a petition to
25 list the species under the federal Endangered Species Act to the United States Fish and Wildlife
26 Service ("FWS"). This petition ultimately led to the current listing of the frog as threatened
27 under the Endangered Species Act.
28

1 6. I have also conducted numerous field studies on the CRLF, logging hundreds of hours
2 searching for, identifying, and monitoring the species during all stages of its life cycle. For
3 example, from 1974 to 1983, I studied populations of the CRLF in Corral Hollow (San Joaquin
4 County), Pico Creek (San Luis Obispo County), and Cañada de la Gaviota (Santa Barbara
5 County). From 1988 to 2002, I studied the last remaining CRLF population in southern
6 California south of Los Angeles, located at Cole Creek on the Nature Conservancy's Santa Rosa
7 Plateau Preserve (Riverside County).

8 7. Besides field research, I have studied historic species accounts, laboratory specimens,
9 and popular writing about California's frogs and snakes, with a particular emphasis on the
10 CRLF. I have reviewed specimens and historic accounts in the American Museum of Natural
11 History in New York; the Burke Museum at the University of Washington; the California
12 Academy of Sciences in San Francisco; the California State University Chico Vertebrate
13 Museum; the Carnegie Museum in Pittsburgh; the Los Angeles County Museum of Natural
14 History; the Museum of Comparative Zoology at Harvard University; the Museum of
15 Vertebrate Zoology at the University of California at Berkeley; the Museum of Zoology at the
16 University of Michigan; the Oregon State University Vertebrate Museum; the Portland State
17 University Vertebrate Museum; the San Diego Museum of Natural History; the Slater Museum
18 at the University of Puget Sound; the Southern Oregon State College Vertebrate Museum; the
19 University of Kansas Vertebrate Museum; and the Smithsonian Institution and its Archives in
20 Washington, D.C.

21 8. My studies have resulted in over 120 peer-reviewed publications and reports over my
22 career. These include studies that have explained the historic overharvest of CRLF in
23 California, revealing that humans—not American Bullfrogs, as previously supposed—were the
24 primary reason for the decline of the species near the turn of the 19th century. I have also
25 demonstrated that the decline of ranid frogs in the North American west is generally explained
26 by introduced fishes more accurately than introduced American Bullfrogs; and that vocal sac
27 differences were a strong indication that two species (now called California and northern red-

1 legged frogs) existed within what was formerly considered one species (simply called red-
2 legged frogs).

3 9. More generally, I have been active in research and field study of many frog species in
4 the family *Ranidae*, to which the CRLF belongs. These frogs are sometimes called "true frogs."
5 True frogs share many similarities, and therefore, lessons learned from one species can help
6 scientists understand the habitat needs of other ranid frogs, while gaining a better understanding
7 of each species' unique evolutionary path. For example, I have studied the ecology and
8 distribution of the stream-dwelling Foothill yellow-legged frog (*Rana boylei*) in western
9 Oregon. I've shown that this species has also sustained a severe contraction in its geographic
10 range over the last 100 years, and that introduced fishes, especially Smallmouth bass
11 (*Micropterus dolomieu*), better explain this species' regional disappearance than do American
12 Bullfrogs.

13 10. My research has also addressed reptiles in California, including rare and endangered
14 snakes. For example, I observed and recorded information on the San Francisco gartersnake in
15 the course of my studies of the CRLF at Pescadero Marsh. Those studies suggest that the SFGS
16 is seasonally dependent on CRLF juvenile production as a summer food resource.

17 11. Through my research and study, I have become an expert in identifying frog and snake
18 species, particularly closely related species, in any and all life stages. I can readily identify egg,
19 larval, juvenile, and adult phases of all California frog species, and eggs, juveniles, and adults
20 of all California snake species through visual inspection, aural calls (typically only applicable to
21 frogs and toads), habitat range, and habitat characteristics.

22 12. My research and study has also made me an international expert in the habitat and
23 ecological needs of frogs and snakes, and the types of habitat modifications that threaten these
24 species. I have studied the Oregon spotted frog (*Rana pretiosa*), a formal candidate for listing
25 under the ESA, over much of the last 20 years in the Pacific Northwest. Via extensive surveys, I
26 have shown that this species has probably been extirpated from the Willamette Valley floor in
27 Oregon and across its geographic range in California. I have also shown that the Oregon
28 spotted frog is resistant to the amphibian chytrid fungus, a pathogen known to have decimated

1 frogs worldwide, but that Oregon spotted frogs are highly vulnerable to predation by introduced
2 American bullfrogs because of their aquatic habits. In the region of Monteverde, Costa Rica, I
3 worked on the entire amphibian and reptile fauna for over three years, and characterized the
4 ecology and distribution of the over 110 species present, demonstrating marked changes in
5 species composition across a rain- to dry-forest gradient.

6 13. I am personally very familiar with Sharp Park, including its main aquatic habitat
7 features: Laguna Salada, Horse Stable Pond, and Sanchez Creek. I have visited Sharp Park on
8 several occasions throughout my career, most recently on June 25, 2011, and I have observed
9 and studied the CRLF at Sharp Park and at surrounding lands. Based on my personal site visits
10 and my interactions with employees with the National Park Service ("NPS"), I am also familiar
11 with restoration efforts that have occurred at Mori Point, a national park unit adjacent to Sharp
12 Park, and the habitat enhancements that have been implemented there for both the CRLF and
13 SFGS by the NPS. Given my expertise and background, I am well-equipped to offer expert
14 opinions concerning the impact of defendants' activities at Sharp Park on both individual
15 CRLFs and SFGSs, and on the prospects for the survival and recovery of the resident
16 populations of these species.

17 14. Although I am not an attorney and I have not been asked to provide an opinion on the
18 legal implications of the defendants' activities that affect the CRLF and SFGS, I have had
19 extensive experience in assisting the State of Washington in developing applications for
20 Incidental Take Permits ("ITPs") and associated Habitat Conservation Plans ("HCPs") in
21 accordance with section 10 of the ESA. Accordingly, I am personally very familiar with the
22 kinds of activities for which ITPs/HCPs are prepared, and the process for developing
23 scientifically supportable mitigation and other measures necessary to obtain the FWS's approval
24 for ITPs/HCPs, especially with respect to measures bearing on the survival and recovery of
25 amphibians. For example, I have been directly involved in coordinating the adaptive
26 management science involving the HCP addressing the largest landscape of any HCP in North
27 America—the Forests and Fish HCP in Washington State—which encompasses over 9,000,000
28 acres of private timberlands and addresses ITPs/HCPs for no fewer than seven species of

1 amphibians in that landscape. Accordingly, while it is not the principal focus of this expert
2 report, as a Senior Research Scientist with the Washington Department of Fish and Wildlife
3 who has worked closely with the FWS, I do have extensive personal familiarity with, and
4 involvement in preparing applications for, ITPs/HCPs and in pursuing FWS approval of them,
5 and I believe that this practical experience could be of assistance to the Court in evaluating
6 whether defendants' activities at Sharp Park should continue to bypass the formal ITP/HCP
7 process.

8 15. For my work in preparing this expert report and related materials and in providing
9 deposition and expert testimony, I am charging Plaintiffs at the rate of \$120/hour, although
10 given the conservation import of this case I anticipate that I will not ultimately bill plaintiffs for
11 all of the work that will be entailed in carrying out these tasks. I have not been deposed or
12 testified as an expert witness in the past four years.

13 **FACTS OR DATA CONSIDERED IN FORMING OPINIONS**

14 16. I have been asked by plaintiffs to proffer opinions on (1) whether the CRLF and SFGS
15 are present at Sharp Park; (2) whether Sharp Park Golf Course's operations and maintenance
16 activities have taken, are taking, and will continue to take members of these species as the term
17 is defined by the ESA and its implementing regulations (*i.e.*, to encompass direct killing or
18 injuring individual members of the species, as well as harassing and harming them through
19 significant habitat modifications that result in actual death or injury to members of the species);
20 and (3) whether such ongoing impacts are likely having adverse effects on the long-term ability
21 of the species' populations at Sharp Park to survive and recover.

22 17. In formulating and rendering my opinions on these matters I have relied on my overall
23 background and familiarity with these species and with related species, as well as the official
24 listing, recovery plans, and other published materials concerning these species issued by the
25 FWS; the published, peer-reviewed literature on the species including my published and
26 unpublished fieldwork on the species; and all publicly available reports, studies, and
27 publications regarding the CRLF and SFGS at Sharp Park, and in particular the materials listed
28 in Attachment C. My opinions are also based on my own site inspections at both Sharp Park

1 and Mori Point; site photographs I have both taken and reviewed (as specified in this report);
2 declarations and other materials filed in connection with plaintiffs' motion for a preliminary
3 injunction (particularly the declarations of Dr. Mark Jennings [hereafter Jennings Decl.], dated
4 October 18, 2011; and Ms. Karen Swaim, [hereafter Swaim Decl.], dated October 21, 2011,
5 both in Case No. 3:11-CV-00958 SD); personal communications I have had with Darren Fong,
6 an Aquatic Ecologist with the Golden Gate National Recreation Area ("GGNRA"); a 2010
7 GGNRA report senior-authored by Mr. Fong, part of which summarizes data collected at Sharp
8 Park and adjacent Mori Point on the CRLF; personal communications I have had with Mr.
9 Kuhn, a former employee of Swaim Biological Consulting who was directly involved in
10 biological surveys at Sharp Park; a 2010 study performed by Brett DiGregorio and his
11 associates concerning snake mortality at a golf course on the Outer Banks in North Carolina,
12 and personal communications I have had with Mr. DiGregorio concerning that research; and
13 pertinent materials produced in discovery in this case (particularly the survey sheets for CRLF
14 egg masses prepared by Jon Campo and other San Francisco Recreation and Parks Department
15 ("RPD") employees; and the deposition testimony of Mr. Campo, Mr. Ascariz, and Ms.
16 Wayne), as well as other materials identified in the discussion that follows. A list of the
17 materials I relied upon in writing this report is attached as Exhibit B.

18 OPINIONS AND THE BASIS AND REASONS FOR THEM

19 I. Sharp Park is Important, Occupied Habitat For the CRLF and SFGS.

20 18. It is my professional opinion that Sharp Park is not only occupied by the CRLF and
21 SFGS, but it is also extremely critical recovery habitat for these imperiled species. For
22 imperiled species in general, their long-term survival and recovery depends on maintaining an
23 adequate number of independent populations, to protect against stochastic (or chance) events,
24 disease, or other threats. Avoiding the loss of the populations of these two species at Sharp Park
25 is essential to the long-term viability of existing populations of SFGS and to reestablish
26 populations within the snake's historic range. Preservation and enhancement of Sharp Park is
27 also essential for the CRLF to recover, and if areas like Sharp Park are not preserved and
28

1 enhanced for the benefit of the species, and take avoided or at least minimized, the CRLF may
2 never recover.

3 19. The threatened CRLF faces a wide variety of threats to its continued existence, and if
4 these threats are not arrested and reversed, a high probability exists that the species will one day
5 go extinct. By the mid-1980s, the species had already been lost from 70% of its historic range,
6 and extirpation of a number of populations extant at that time has occurred since then.
7 Destruction and adverse modification of the species' terrestrial and aquatic habitat is the
8 primary reason for these declines, though this has been exacerbated by periodic extreme drought
9 conditions over the last 25 years. The latter conditions are a poorly recognized part of climate
10 change. Within the climate change trajectory under which we currently exist, more
11 extraordinary measures are necessary to protect the terrestrial and aquatic habitat for the CRLF.
12 In particular, this trajectory is characterized by greater frequency of climatic extremes (either
13 drought or precipitation events) that will make it increasingly difficult to prevent or mitigate
14 adverse changes to CRLF and SFGS habitats.

15 20. The endangered SFGS is critically imperiled: it is the most endangered serpent in North
16 America. The species' natural range, centered on San Mateo County, is intrinsically small.
17 However, many of the species' most important known habitats were lost to urbanization and
18 development, and today the species is found in significant numbers in only a few fragmented
19 locations. The species is now so rare that accurate estimation of its total population size is
20 difficult. This is because it is inherently difficult to find rare species when few individuals are
21 present overall, and surveys that detect even one SFGS are therefore infrequent. This zero-
22 inflated survey frequency (i.e., an excess of zero-observation surveys due to the species' rarity)
23 makes population estimation, even using mark-recapture approaches, unreliable.

24 21. Given the ongoing, serious threats to the CRLF and SFGS throughout their ranges,
25 conserving these species over the long term depends on affording adequate protections to the
26 species in those remaining habitats where the species are present. It is my professional opinion
27 that both the CRLF and SFGS are present at Sharp Park. The presence of the CRLF at Sharp
28 Park is well documented. Several of the defendants' publications and reports have confirmed

1 the presence of the species on the property, including the Sharp Park Conceptual Restoration
2 Alternatives Report and several biological reports prepared by the City's biological consultants.

3 22. On June 26, 2011, I personally observed CRLF's along the channel connecting Laguna
4 Salada to Horse Stable Pond, and in Horse Stable Pond. True and correct copies of photographs
5 of CRLF that were taken during my visit to Sharp Park on June 26, 2011 were attached to my
6 October 6, 2011 Declaration (see Docket No. 60-3, Ex. C). It is my unqualified professional
7 judgment that the CRLF is present at Sharp Park.

8 23. It is similarly my unqualified professional judgment that the SFGS is present at Sharp
9 Park. The recorded literature shows that over 40 specimens were collected there in the mid-
10 1940s, that similar numbers were observed near Horse Stable Pond in the 1970s, and that more
11 recently four SFGS were recorded at Horse Stable Pond in 2005, and two more were found a
12 few feet south of Horse Stable Pond during removal of old tires on September 29, 2008. It is
13 my understanding that three SFGS were observed at Mori Point in 2011, directly adjacent to
14 Sharp Park to the South.

15 24. In addition to these SFGS sightings, my judgment that SFGS continue to occupy Sharp
16 Park is also based on the fact that the focal prey base upon which the SFGS depends, life stages
17 of stillwater-breeding amphibians, remains available at Horse Stable Pond, though as I discuss
18 later, this prey base is being harmed by RPD's activities. Moreover, other lines of evidence
19 indicate that SFGS continue to occupy Sharp Park. SFGS, like all gartersnakes, feed exclusively
20 in aquatic habitats. Aquatic habitat at Sharp Park includes Horse Stable Pond and Laguna
21 Salada, both of which are stillwater habitats, on which SFGS are cued to search for stillwater-
22 breeding amphibian prey regardless of whether that prey is present, because that type of habitat
23 is the only aquatic habitat in which those amphibians reproduce. For snakes to ignore the
24 aquatic habitats in which their focal prey breeds would put them at risk. Hence, searching
25 behavior by SFGS in stillwater habitat for their stillwater-breeding amphibian prey would be
26 expected. The only suitable alternative stillwater habitats available, several of the ponds that
27 now exist at Mori Point, did not become available until after 2005, when they were created. Yet
28 these ponds subsequently attracted SFGS, indicating that the recovery efforts at Mori Point are

1 succeeding. Further, Sharp Park's proximity to known SFGS habitats at Mori Point and Lower
2 San Francisco Public Utility Commission watershed lands that can be used for seasonal
3 overwintering, coupled with the fact that most SFGS sightings over the last 25 years in the area
4 have occurred near the Sharp Park/Mori Point boundary south of Horse Stable Pond indicate
5 that SFGS move across that area seasonally. These collective data indicate that no valid
6 scientific reason exists why individual San Francisco gartersnakes would not be present at Sharp
7 Park.

8 25. Accordingly, I agree with the City and County of San Francisco's own biologist, Karen
9 Swaim, who concluded in her 2008 report (on p. 3-2, section 3.2, end of first paragraph) that
10 past "observations, the abundance of prey items in these areas, their proximity to observations
11 of the snake at Mori Point and Horse Stable Pond, and historical occurrence suggest that SFGS
12 likely forage in and move through the areas around Lower Sanchez Creek, Laguna Salada, the
13 canal, and Horse Stable Pond."¹ Given the 2011 observations of SFGS at Mori Point mentioned
14 previously, the validity of SFGS currently using adjacent areas of Sharp Park still stands.

15 II. Activities At Sharp Park Are Taking the CRLF and SFGS

16 26. In my professional opinion, a host of activities being undertaken by the RPD at Sharp
17 Park are taking the CRLF and SFGS, both directly and indirectly. For purposes of this report, I
18 will address activities that, if left unchanged, are virtually certain to cause ongoing take of the
19 species. For purposes of this report, I am applying the definitions of "take" that I understand to
20 be set forth in the ESA and implementing regulations, i.e., take is defined by the ESA to
21 encompass actions that include "killing," "injuring," "harassing," and "harming" members of a
22 listed species. I also understand that the ESA implementing regulations define "harass" in the
23 definition of take to encompass an action that creates the likelihood of injury to wildlife by
24 annoying it to such an extent as to significantly disrupt normal behavioral patterns such as
25 breeding, feeding or sheltering; and that the regulations define "harm" in the take definition to
26 include actions that entail significant habitat modification or degradation where it actually kills

27 ¹ However, I do not concur with Ms. Swaim's conclusion that an abundance of potential SFGS
28 prey in Laguna Salada—which I will demonstrate, based on Swaim's own data, are in fact
largely lacking in the lagoon—drives SFGS foraging. Rather it is the presence of stillwater
habitat with the potential of containing suitable prey that drives SFGS foraging activity.

1 or injures wildlife by significantly impairing essential behavioral patterns including breeding,
2 feeding, or sheltering

3 27. Applying these definitions of take to the relevant scientific information, it is my opinion
4 that a number of activities routinely undertaken by RPD employees take, and will unavoidably
5 continue to take, the CRLF and SFGS. These activities include water pumping, which leaves
6 frog egg masses exposed to the air; entrains frog tadpoles, metamorphs or juveniles in the
7 pumps; injures juveniles and possibly adults by plastering them against the intake screens of the
8 pumping gate; and which I understand can alter hydrological gradients in Laguna Salada such
9 that salinity levels may become high enough to kill CRLF embryos, and possibly early life
10 stages. The harmful activities also include mowing, which can kill or injure both species with
11 blades or by crushing them with wheels; and golf cart use, both on and off golf cart paths, which
12 can crush CRLF and SFGS.

13 A. Water Management Activities

14 28. When the winter rains come, the golf course at Sharp Park floods. Photographs of
15 flooding events at Sharp Park were attached to my October 6, 2011 Declaration (see Docket No.
16 60-3, Ex. B). To eliminate the flooding, the golf course has installed two pumps that drain
17 Sharp Park's aquatic features and send the water through an earthen berm and onto a relatively
18 saline pool on a sandy beach at low tide and out to sea at high tide. It is my professional
19 opinion that these pumping operations causes take of the CRLF in three distinct ways: (1)
20 through desiccation of egg masses; (2) through entrainment in the pumps; and (3) through
21 modification of habitat in Sharp Park water bodies. By modifying habitat and reducing prey
22 availability by taking CRLF, pumping is also reasonably certain to be taking SFGS.

23 1. Egg Desiccation and Stranding

24 29. The CRLF is the largest frog native to the west. Like all true frogs, the species requires
25 aquatic habitats in which to breed and lay eggs, and for tadpoles to develop, metamorphose into
26 juveniles, and become adults. Under normal conditions, the frog will lay its eggs during late
27 winter rains and attach its egg masses to aquatic vegetation near the high water mark. If the
28 water levels are sufficiently deep for a long enough interval, the eggs will hatch, tadpoles will

1 emerge and feed, and eventually become adults. However, by pumping water from Sharp Park
2 Golf Course during the rainy season, the golf course exposes CRLF egg-masses to the air,
3 causing these eggs to desiccate or become stranded, and the animals will die.

4 30. I base this conclusion on my decades of work on the species, my understanding of the
5 RPD's egg mass monitoring data, as well as my review of reports published by the City and
6 County of San Francisco. I concur with the view expressed in the City's Conceptual
7 Alternatives Report, which explains (on page 39) that at Sharp Park, when "the water levels
8 drop, these egg masses can be stranded on dry ground and desiccate," and that "[e]ven if water
9 persists long enough for eggs to hatch in these areas, most tadpoles would have limited mobility
10 in the dense vegetation in the marsh area and may be stranded well before metamorphosis." If
11 pumping were ceased once CRLF eggs are laid, it is my professional opinion that egg masses
12 would not become stranded and desiccate, and there would be sufficient water for CRLF eggs to
13 develop into fully formed-frogs.

14 31. CRLF attach their eggs to a vegetation brace near the water surface because it ensures
15 higher survivorship at hatching. Because the eggs are attached at a specific point on aquatic
16 vegetation, they have only limited ability to rise and fall with water levels corresponding to the
17 pliability of egg mass jelly. It therefore does not require much lowering of water levels to strand
18 CRLF eggs. Pumping during the breeding season puts CRLF eggs at high risk of being killed.
19 When pumping occurs during the peak-breeding season, an entire annual cohort (generation) of
20 CRLFs can be jeopardized at once. Peak breeding season corresponds with the times that the
21 golf course floods, and therefore, in every year with sufficient rains, golf course pumping
22 operations that take CRLF eggs are a certainty.

23 32. Indeed, the available data is overwhelming that CRLF egg masses are being desiccated
24 and stranded due to defendants' pumping operations rather than any natural or other factors.
25 Unlike species of western North American *ranid* frogs that typically lay unattached egg masses
26 in water having a shallow total depth (7.5-15 centimeters [3-6 inches]) (for example, Cascade
27 Frog [*Rana cascadae*] and Oregon Spotted Frog [*Rana pretiosa*]) and that are, as a
28 consequence, vulnerable to water fluctuations, CRLFs are less susceptible to stranding because

1 they typically deposit egg masses attached to a vegetation brace where total water depth is
2 somewhat greater (>15 centimeters [>6 inches]). Moreover, the jelly in which CRLF eggs are
3 imbedded is somewhat pliant and elastic, and the vegetation braces on which the CRLF
4 typically deposits its eggs also have some pliability. In combination, these factors allow CRLF
5 egg masses to generally tolerate some water fluctuation without stranding. Stranding of CRLF
6 egg masses uninfluenced by human activities does occur, but rarely; and typically involves few
7 egg masses. I have personally viewed it but three times (each time involving 1 to 3 egg masses)
8 in many observations of many hundreds of CRLF egg masses over my years of field work on
9 this species.

10 33. The stranding and desiccation rate at Sharp Park, in contrast, reflects an alarming
11 increase of strandings compared to what would be expected in the absence of human
12 interference. According to data produced in discovery, in 2011 nearly 80% (128) of the 159
13 CRLF egg masses observed by the City of San Francisco at Sharp Park had to be moved to so
14 the eggs or subsequent tadpoles would not become stranded (Docket No. 54-6, Ex. 10). This is
15 an incredibly high rate of egg-mass stranding, much higher than any rate documented in the
16 scientific literature. It cannot be explained by normal variability in rainfall, topography, or
17 drainage—it can *only* be a product of human agency adversely affecting habitat conditions on
18 the site. In my professional opinion, therefore, the data is overwhelming that defendants'
19 pumping operations are causing and will inevitably continue to cause a large number of CRLF
20 egg mass desiccations and strandings.

21 2. Entrapment in pumps

22 34. The second way that the pumping operations inevitably cause take of the CRLF is by
23 entraining tadpoles or other mobile life stages of the species in the pumps as they suck water
24 from Horse Stable Pond out to sea. I have reviewed documents indicating that the City has long
25 known that the massive amounts of water sucked from Horse Stable Pond have a high
26 probability of entraining CRLFs. On June 25, 2011, during a visit to Sharp Park, I personally
27 observed an adult CRLF on flotsam that had accumulated immediately adjacent to the debris
28 grate to the inflow compartment of the Sharp Park pump house in Horse Stable Pond. A copy

1 of a photograph of that frog in this location was attached to my October 6, 2011 Declaration
2 (see Docket No. 60-3, Ex. C). Had the pump been turned on with any frog life stage adjacent
3 to this debris grate, it would be at high risk of entrainment. Entrained animals small enough
4 would go through the grate, and if they survived the sheer stress of moving through the outfall
5 pipe, would be swept into inhospitable (saline) habitat in the pool below the outflow pipe on the
6 upper beach. If they were too large to go through the grate, such as an adult CRLF might be,
7 they would be plastered against the grate until the suction was reduced when the pump was shut
8 off. An animal remaining plastered to the grate for too long an interval (that is, the pump
9 remaining on continuously for more than 30 minutes) would likely either drown if it was
10 beneath the water line or be irreversibly injured because it was unable to do the normal buccal
11 pumping (a movement of its throat muscles) required for it to ventilate its lungs. The latter
12 would deprive the Frog of sufficient oxygen. I have observed several individuals of a closely
13 related species, the Northern Red-legged Frog (*Rana aurora*), die because they were plastered
14 to a grate with similar-sized mesh through which there were only moderate flows, and based on
15 the capacity of the pumps at Sharp Park (over 25 cubic feet per second ("cfs") potential
16 capacity; at least 15.5 cfs actual capacity) the same fate would befall the CRLF.

17 35. It is also my professional opinion that it is virtually certain that CRLF tadpoles have
18 been taken, and will continue to be taken, by the Sharp Park pumping operations as they are
19 drawn into the pump and spewed out to sea. Crayfish are strong swimmers and have a hard
20 exoskeleton. I have reviewed documents reflecting that crayfish have been sucked through the
21 pumps at Horse Stable Pond. A photograph of a freshwater crayfish observed inside Sharp
22 Park's outfall pipe was attached to my October 6, 2011 Declaration (see Docket No. 60-3, Ex.
23 D). The crayfish could only have gotten here by being pumped through the pump house. I have
24 also reviewed a Swaim Biological, Inc. Sharp Park Outfall Repair Biological Monitoring Form
25 from November 23, 2008, which states that "several dead crayfish found at discharge end of
26 pipe at beach," and concluding that "if crayfish can become entrained in pump then frogs might
27 also." California red-legged frog eggs and tadpoles, unlike crayfish, have a highly flexible
28 cartilaginous skeleton surrounded by a jelly-like body, and they are weak swimmers,

1 particularly during the very early stages of development. Since strong swimming species such
2 as crayfish have been observed dead after being sucked through the pump house, tadpoles
3 would also be sucked into the pump intake under the same or weaker forces.²

4 3. Habitat modification

5 36. The third way the pumping operations cause take of CRLF is by keeping the aquatic
6 habitats artificially shallow, which degrades habitat quality for CRLF aquatic life stages.
7 Pumping creates shallow aquatic conditions that promote the growth of cattails and tules,
8 aquatic plant species that cannot tolerate deeper water conditions. Over the years, these two tall
9 emergent plant species have encroached on the stillwater aquatic habitats in Sharp Park, namely
10 Laguna Salada, Horse Stable Pond, and the connecting channel between them, greatly reducing
11 the amount of open water, floating, or low emergent vegetation that is suitable habitat for the
12 CRLF and SFGS to breed and feed. This reduces the overall habitat quality for these two
13 species, and reduces the habitat footprint needed for individual frogs and snakes to perform the
14 behaviors they require for survival, behaviors like breeding, feeding, and sheltering. It is my
15 professional opinion that this encroachment, which is really a promotion of succession in a
16 coastal lagoon system that would not otherwise exist at present, is a direct consequence of the
17 Golf Course's ongoing pumping of Horse Stable Pond and Laguna Salada. Lagoons along the
18 coast of California typically have a stream dynamic, largely through winter high flows, that
19 renews their open water habitat footprint. Laguna Salada is a historic lagoon, but its system
20 dynamics are already constrained to varying degrees, mostly by presence of an artificial
21 shoreline berm or seawall. Although these constraints might be expected to alter the lagoon
22 over a long timeline (many decades to a few hundred years), the pumping pattern from Horse
23 Stable Pond has rapidly accelerated the timeline for this encroachment, impairing the species'
24 habitat in a manner that is causing impacts to the species' breeding, feeding, sheltering, and
25 other essential life functions.

26 ²Because tadpoles, and in particular recent hatchlings, are extremely delicate, it is highly likely
27 that once the tadpole enters the pump, it will be shredded or torn into unidentifiable pieces
28 before these pieces are spewed to the beach. The bony structures of fish and crayfish, on the
other hand are likely to remain at least partially intact through such trauma, making them
much easier to observe and, in my professional opinion, good indicators of take of the CRLF
in this manner.

1 37. Pumping also modifies CRLF habitat by changing hydrological gradients affecting
2 Laguna Salada. As pointed out by Dr. Peter R. Baye in his technical review and comment of the
3 Sharp Park Conceptual Restoration Alternatives Report (hereafter Alternatives Report Review),
4 pumping of water from Horse Stable Pond will alter hydrological gradients in Laguna Salada in
5 the long run, especially between the groundwater interface between the Ocean and Laguna
6 Salada. More specifically, as the climate change trajectory promotes continuing sea level rise,
7 Dr. Baye's report suggests that it will become more likely that pumping will modify
8 hydrological gradients around Laguna Salada and increase salinity within CRLF breeding
9 habitats. Coupled with the likelihood that ocean wave overtopping of the seawall will continue
10 to increase sea level rises, habitat degradation due to increased salinity in Laguna Salada is
11 ultimately a certainty unless management practices at Sharp Park are changed.

12 38. Third, pumping can force young CRLF tadpoles into unsuitable habitat if pumping
13 reduces water levels after the young tadpoles hatch from egg masses. At high water levels,
14 oviposition along Laguna Salada's east margin has been well documented. However, because
15 pumping eliminated water depth in this location, the City was forced to move large numbers of
16 these egg masses to prevent massive egg die-offs. If these egg masses had been allowed to
17 hatch when the water levels were sufficiently high, they would have had a high probability of
18 long-term survival.

19 39. These same consequences of the City's water management activities at Sharp Park are
20 also reasonably certain to take the SFGS. First, by destroying egg masses, and in turn, reducing
21 the number of CRLFs in the Park, the pumping reduces the available prey base for the Snake in
22 such a manner as to reduce the prospects for survival of individual Snakes that depend on the
23 site. Second, SFGS may also become plastered against the grate – or juveniles sucked through
24 the grate – just as with the CRLF. Third, as noted, these activities adversely modify SFGS
25 habitat in such a manner as to limit the ability of the SFGS to feed, breed, and engage in other
26 critical life functions.

1 **B. Inability of the Compliance Plan to Prevent Take From Pumping Operations**

2 40. It is my understanding that the City has prepared an "Endangered Species Compliance
3 Plan" ("Compliance Plan") for Sharp Park, which I have reviewed. It is my professional
4 opinion that, even if the Compliance Plan were fully implemented, take of CRLF is nonetheless
5 reasonably certain to continue through pumping-induced desiccation, entrainment, habitat
6 modification, and impingement. Moreover, based on records of pump management and
7 operations I have reviewed, my own observations of Sharp Park, and my professional opinion, I
8 believe that the City is not and cannot actually implement the Compliance Plan.

9 41. The Compliance Plan is predicated on the City's ability to manage water levels to avoid
10 desiccating or stranding frog egg masses. The inadequacy of this premise was made clear this
11 past winter, when more than one hundred CRLF egg masses were put at risk of desiccation, and
12 eggs in at least one egg mass were killed by the pumping operations at Sharp Park, despite the
13 implementation of the Compliance Plan protocols.

14 42. It is my understanding, based on City records, that beginning in January, 2011,
15 Recreation and Park Department staff-member Jon Campo was required to move over 100 egg
16 masses which he concluded would be stranded and desiccate if left in place. See Docket No.
17 54-3, Ex. 5). I have also reviewed photographs of an egg mass that was documented at Horse
18 Stable Pond completely exposed to the air, and ultimately found desiccated and partially frozen
19 after extended pumping occurred pursuant to the Compliance Plan protocols. (see Docket No.
20 60-1, Ex. 3 and Docket No. 60-2, Ex. 4).

21 43. All of these egg mass strandings occurred despite the Compliance Plan because pumping
22 water from Sharp Park during CRLF is inherently in conflict with successful frog breeding
23 efforts. Sharp Park's pumps cannot pump water as fast as the rain flows into the system during
24 normal winter rains. This causes floodwaters to rise above the level at which the Compliance
25 Plan specifies the water must be retained. Indeed, upon reviewing the deposition transcript of
26 John Azcariz, the City's stationary engineer, it is apparent that this fluctuation in water levels is
27 part of the design of the Compliance Plan, despite the plan's purported desire to prevent waters
28 from fluctuating. Rapid cycling of the pumps' on/off mechanism places additional wear and

1 tear on the pumps, so to improve pump longevity the City purposefully allows water levels to
2 rise for some period of time before the pumps are turned on. Azcariz Dep., p. 25. When the
3 pumps turn on and draw the water back down to the original water level, any egg mass that is
4 laid in the interim will become stranded and die. Because it can take days for the water to be
5 drawn down from a large storm, many CRLF egg masses that were laid under high water
6 conditions will be exposed to the air or stranded in isolated pools, even though the Compliance
7 Plan would be functioning as designed.

8 44. In addition, because the Compliance Plan allows, indeed commands, that a large amount
9 of water to be pumped out to sea, the water that remains to secure egg and tadpole development
10 is reduced. If a large rain event is followed by an extended drought, the buffer of rainwater
11 provided by the initial storm event is eliminated, and the frog eggs and tadpoles are at risk of
12 stranding or mortality.

13 45. As discussed above, the City addressed the failure of its Compliance Plan by moving
14 stranded egg masses by hand into deeper waters. But it is my understanding the City will no
15 longer be permitted by the FWS to relocate egg masses in Sharp Park until the City obtains
16 incidental take authorization for its ongoing activities. Dec. 8, 2011 FWS letter. It is also my
17 understanding based on Lisa Wayne's January 9, 2012 deposition (at pp. 222-227) that the
18 City's pumping protocols are going to remain unchanged despite this development, and that Ms.
19 Wayne stated "I don't have any specific plans" when she was asked how she would change
20 protocols in response to this development. Her only suggestion was that she would "let the Fish
21 and Wildlife Service know" if egg masses become stranded again this year. In light of these
22 facts, it is my professional opinion that egg mass strandings will be unavoidable in any winter
23 with precipitation levels are sufficient to raise water levels to the emergent edge of Laguna
24 Salada. Given the FWS's prohibition on moving egg masses, any egg mass so laid will likely
25 desiccate and die.

26 46. Even if FWS were to reverse course and permit the City to move stranded egg masses
27 this year, the City's approach to locating, monitoring, and moving egg masses is so flawed that
28 so long as the City continues to pump during the breeding season, the City can not possibly

1 ensure that take of CRLF is reduced to the point that permits from FWS are no longer
2 necessary. The City's approach relies on perfect detection levels by biological monitors as they
3 search for CRLF egg masses in the tules, cattails, and bulrushes around Sharp Park's many
4 acres of waterways, ponds, and canals. However, even with attached, essentially immobile life
5 stages like eggs, it is not possible to detect all of the egg masses, or even estimate their
6 individual detectability rate (a condition necessary to estimate egg mass abundance), using
7 single-pass surveys. It is my understanding, based on Mr. Campo's deposition testimony (at pp.
8 50, 116), that Mr. Campo believes that he cannot observe all egg masses due to several
9 observation constraints, and that he has explained this to his supervisors previously. I concur
10 with this sentiment. In my extremely broad field experience with amphibians and reptiles, I
11 know that detecting every frog and snake during a single-pass survey is nearly impossible to do,
12 even where habitat complexity is extraordinarily low and the surveyor has the highest possible
13 visibility of the habitat. Yet this nearly impossible task is critical to the success of the
14 Compliance Plan, and that is why the plan is simply not capable of stopping take of CRLF at
15 Sharp Park.

16 47. Locating and then moving stranded or nearly stranded egg masses due to pumping
17 operations is itself a highly questionable mitigation measure. As a preliminary matter, CRLF
18 typically deposit eggs in habitats where at least some of the offspring have a high probability of
19 survival, otherwise the species would rapidly go extinct. It is therefore likely that moving egg
20 masses from the locations CRLF chose to breed will have some deleterious impact. Moreover,
21 most of the egg masses moved last winter were moved into Horse Stable Pond. Movement of
22 egg masses from Laguna Salada to Horse Stable Pond, where a number of CRLF egg masses
23 had already been laid, risks decreasing the survivorship of tadpoles in Horse Stable Pond
24 because tadpole density is artificially and greatly increased. As density increases, CRLF
25 carrying capacity can be reached or exceeded, and tadpole survival rates can decrease.

26 48. Additionally, CRLF egg masses are delicate, and individual eggs, and even entire egg
27 masses, can be harmed and may become unviable when they are moved. It is my understanding
28 from the testimony produced in this case that when Mr. Campo moves egg masses he does not

1 ensure that the egg mass is attached to a brace at the new location. Campo Dep., Docket No. 54-
2 5, p. 57. He has also observed egg masses break apart as a consequence of a move, and he has
3 further observed that the egg masses sometimes disappear from places he has moved them to.
4 *Id.*, 58-62. Since a CRLF egg mass, when laid, is attached to a vegetation brace, to move the
5 egg mass it must be removed from that brace and either re-attached to a new brace if placed in
6 deep water, or laid in shallow water to ensure survival. This is because egg masses through the
7 first two-thirds of the developmental interval will sink (they are denser than water) in deep
8 water if unattached, which will increase the likelihood of mortality. Egg masses placed in
9 shallow water to avoid the sinking problem will risk stranding if pumping occurs, or risk
10 floating into deeper water if unattached and any disturbance occurs.

11 49. In addition, because the City's practice has been to move all egg masses into Horse
12 Stable Pond—where the suction from the pumps is highest—egg mass movement puts tadpoles
13 at a higher risk of entrainment and impingement. The Compliance Plan lacks adequate protocols
14 to prevent impingement or entrainment of tadpoles or other mobile life stages of the CRLF. In
15 particular, the Compliance Plan does not provide for regular observation or monitoring once
16 pumps are turned on after egg masses hatch; it does not provide for a screening mechanism
17 around known oviposition sites that would prevent tadpoles, particularly hatchlings, from
18 swimming too close to the pump intake port during a pumping event; and it does not provide for
19 some kind of velocity reduction mechanism, such as screening baffles, associated directly with
20 the intake port to reduce the likelihood of CRLF life stages being plastered against the screen.

21 50. It is my professional opinion that the unauthorized take of CRLF and SFGS through
22 pumping operations will continue so long as RPD operates the pumps at Sharp Park, and that
23 prohibiting pumping when egg masses are found will stop pump-related strandings of frog egg
24 masses and will ensure that tadpoles are not entrained or impinged. Ceasing pumping when egg
25 masses are observed would ensure that egg masses have the greatest possible chance to develop,
26 and tadpoles to metamorphose to adult frogs before water levels decrease when the rains stop.
27 This has been recognized by a wide variety of research, and is the appropriate conclusion based
28 on my many years of research. I concur with the statement contained in Appendix C of the

1 City's "Sharp Park Conceptual Restoration Alternatives Report," in which the City's consulting
2 biologist, Karen Swaim, concluded that "[d]iscontinuing pumping at Horse Stable Pond would
3 be expected to result in reduced fluctuations in water level and a lower risk of egg mass
4 desiccation. . . . Under ambient conditions, rainfall and inflow from the rest of the watershed
5 during this period would prevent egg masses from becoming stranded above the waterline." I
6 also concur with Ms. Swaim's recommendation in the same report that the City should
7 "[e]liminate unnatural water level reductions during the frog breeding season."³

8 51. Discontinued pumping would also ensure that tadpoles or other mobile life stages of the
9 CRLF are not entrained or damaged by the pump, since no pumping would be occurring.

10 52. Discontinuing pumping would have the added benefit of improving overall habitat
11 conditions for the CRLF by limiting the growth of tules and cattails, which are currently
12 encroaching on a large number of acres of habitat for the frog. Tules and cattails cannot grow in
13 deep water, and other vegetation types or open water eventually replaces them as water levels
14 rise. This would provide additional habitat availability for frog breeding, egg laying, and
15 tadpole development, significantly improving habitat quality and eliminating the impediments
16 to the CRLFs' essential breeding patterns currently imposed by the golf course water
17 management. Discontinuing pumping would also have the benefit of reducing the likelihood of
18 saltwater intrusion into Laguna Salada, and as a consequence, increase the likelihood that CRLF
19 would make greater use of the Laguna Salada for breeding. Water quality data collected within
20 the last 10-year window in Laguna Salada coupled with my own direct observations of the
21 vegetation on selected areas on the west side of Laguna Salada strongly suggest that a salinity
22 influence on Laguna Salada currently exists that appears to vary seasonally. Pumping is likely to
23 exacerbate salinity to levels that would be lethal to CRLF embryos.⁴

24
25 ³ I have observed atypical water level fluctuations, the consequence of pumping, inhibit
26 breeding in a pond used by Northern red-legged frogs and observed individuals breed in an
27 immediately adjacent pond. Excessive water level fluctuation inhibits breeding in the stream-
28 breeding Foothill yellow-legged frog, so it would not surprise me that atypical fluctuations
might not only inhibit breeding at the appropriate time in the CRLF, but it risks egg mortality
from stranding after breeding has begun. Any action that minimizes water level fluctuation
prior to or during breeding for the CRLF would enhance its successful breeding.

⁴ Dredging Laguna Salada to reduce its dense vegetation footprint could result in much more
harm and risk to both the CRLF and the SFGS. In particular, the excavation of anoxic organic

1 C. Take From Mowing and Other Activities

2 53. Mowing and/or golf cart operations have also been documented to cause take of
3 endangered species at Sharp Park in the past, and it is my professional opinion that these
4 operations also are reasonably certain to result in take of CRLFs and/or SFGS in the future.
5 According to the FWS's 2006 Five-year Status Review of the SFGS, which I have reviewed, a
6 dead SFGS found at Sharp Park in 2005 had been killed by a golf course lawn mower. I have
7 reviewed the declaration of Steve Salisbury, which explains that Mr. Salisbury discovered this
8 dead snake on Sharp Park's Hole 12 near the edge of the green, and I have reviewed the
9 photographs of this snake and have read the correspondence that accompanied the file, all of
10 which is attached to my October 6, 2011 Declaration, see Docket No. 60-3, Ex. E. I concur that
11 the snake was killed either by a lawn mower or another mechanized vehicle, such as a golf cart.
12 The dorso-ventral compression indicated in the picture of this animal is characteristic of road-
13 killed snakes that have been run over by a vehicle, of which I have observed many thousands
14 during thousands of hours of road-riding for snakes in my career. However, animals road-killed
15 by car-sized vehicles or larger, especially those the size of a SFGS, typically show extreme
16 dorso-ventral compression: that is they are often paper thin because they have been run over by
17 a number of large vehicles (cars, trucks, or semis) in a relatively short period of time. The
18 animal killed at Sharp Park's Hole 12 shows only a moderate amount of dorso-ventral
19 compression, indicating that the mass of the vehicle or vehicles that ran it over was not as
20 extreme, such as something in the mass range of a mower or a golf cart.

21 54. Though golf carts have traditionally been viewed as innocuous, recent work clearly
22 demonstrates that they are responsible for substantial mortality among snakes. A 2010 study by
23 Brett DiGregorio and his colleagues on an Outer Banks golf course in South Carolina, see
24 Docket No. 79-1, Ex. B, in an area where car-sized vehicle traffic is virtually non-existent,
25 concluded that nearly all of the more than 200 snakes found road-killed in the study were killed
26 by golf carts or lawn mowers, since no other vehicles are used on golf course grounds. Further,
27

28 wetland soils can result in the excessive release of toxic sulfides and their acid sulfur oxidation
products can subsequently become manifest.

1 all direct observations by these investigations of a golf cart striking a snake resulted in the death
2 of that snake (B. DiGregorio, *personal communication*).

3 55. It is reasonably certain that many more SFGS have been killed by mowing and golf cart
4 operations in Sharp Park than have been documented. However, detecting dead SFGS is
5 difficult to do, because snake carcasses are rapidly scavenged. Corvid (various species of crows,
6 ravens and jays) and larid birds (various species of gulls), a number of carnivores (especially
7 foxes, coyotes) and various other species are highly opportunistic scavengers on carrion and
8 will rapidly remove carcasses when these become available.

9 56. During my two recent (2011) short (partial day) visits to Sharp Park, I observed many
10 crows, gulls, jays, and I heard ravens, and I also directly observed one or two foxes on each
11 visit. The foxes were scavenging from human garbage, suggesting that they were food-limited.
12 In such an environment, I would expect carcasses of either SFGS or CRLF to be available for an
13 observer to detect for only a short time. In fact, Brett DiGregorio and his colleagues clearly
14 demonstrated in a study currently in press (B. DiGregorio, *personal communication*), Docket
15 No. 60-3, Ex. F, that a suite of effective scavengers can result in substantial underestimate of
16 road-kill mortality. My observations of the scavenger set at Sharp Park indicates that numerous
17 effective scavengers are clearly present, so underestimating SFGS mortality at Sharp Park is the
18 anticipated result.

19 **D. Inability of the Compliance Plan to Prevent Take Through Mowing**

20 57. Even if fully implemented, the City's Compliance Plan does not eliminate the reasonable
21 certainty that take from mowing and golf operations will occur, given that the scale of mowing
22 and golf cart use, particularly around the edge of water features, is so massive. As I understand
23 the Compliance Plan, it relies on biological monitors to observe numerous acres of habitat with
24 100% reliability to ensure that all frogs and snakes will be detected, moved, or mowing delayed
25 until the species are clear from danger. However, the protocol, even if implemented faithfully,
26 cannot attain this level of reliability; rather it is certain to be *unable* to detect all frogs and
27 snakes present. No species of amphibian or reptile has perfect individual detectabilities, and
28 where detectability has been measured it is typically far less than one, with snakes often having

1 detectabilities less than 0.2 (a detectability of 0.2 simply means that for every individual you
2 see, there are 4 other you did not observe). In imperfect detectability situations, which are the
3 norm for amphibians and reptiles, it is essential to know the levels of detectability of the
4 animals you are trying to observe, or you cannot obtain accurate survey results. But the
5 Compliance Plan protocol, which relies on single-pass, visual surveys before mowing occurs,
6 cannot estimate detectability rates—at least two passes under controlled circumstances would be
7 needed to estimate detectability, and such controlled conditions are unlikely to occur at Sharp
8 Park. Therefore, the City is likely to take SFGS or CRLF simply because it failed to detect the
9 animal under the Compliance Plan protocol.

10 58. Moreover, it is my understanding that monitoring at Sharp Park is being conducted by
11 the golf course mowing staff, and that this monitoring is infrequent, sometimes conducted in the
12 dark, and not conducted by individuals with the requisite training (Kappelman Deposition, pp.
13 51-56). Therefore, even these basic, albeit inadequate monitoring safeguards contained in the
14 Compliance Plan are not being implemented. Hence, this inadequate protocol is highly likely to
15 result in take.

16 59. For these reasons, it is my professional opinion that unauthorized take of SFGS and
17 CRLF through mowing operations is highly likely to occur unless defendants cease mowing and
18 golf cart use within roughly 200 meters of the delineated wetland boundary area at Sharp Park,
19 which will ensure that the species are not taken while they traverse within their normal daily
20 range. Moreover, the size of the buffer area will ensure that edge and upland habitats will
21 extend out beyond the high water mark of flooded areas, and provide secure refuge, estivation
22 and underground habitat for snakes and frogs.

23 **III. The Ongoing Take Threatens The CRLF and SFGS Populations At Sharp**
24 **Park/Mori Point, and Undermines NPS's Recovery Efforts**

25 60. It is my professional opinion that unless golf course operations that cause ongoing take
26 of the CRLF and SFGS are halted or at least significantly curtailed, populations of both species
27 in the Sharp Park/Mori Point complex will likely be lost in the foreseeable future. With respect
28 to the SFGS, in view of the extremely imperiled status of the species and the critical importance

1 of conserving all remaining populations, it is my professional opinion that the ongoing take that
2 is occurring at Sharp Park is jeopardizing the entire species.

3 61. Moreover, because of Sharp Park's proximity to recovery efforts at Mori Point, the golf
4 course is also negatively affecting a functioning recovery process. The Mori Point recovery
5 effort is the driver that maintains and enhances the CRLF and SFGS at the Sharp Park/Mori
6 Point complex. If the harmful activities at Sharp Park are not arrested, the recovery efforts
7 complete disruption and ultimately fail.

8 62. As a preliminary manner, the available data does not support the proposition that there
9 has been an "overall increase in the number of CRLF in Horse Stable Pond and to a lesser
10 extent, in Laguna Salada." Decl. of Lisa Wayne, Docket No. 72, p. 2. In fact, Fong et al. 2010
11 showed CRLF egg mass numbers in Horse Stable Pond were, at best, stable from 2003 to 2009,
12 *not* that the egg mass numbers have been increasing. My own analysis of the data set
13 supplemented with 2010 and 2011 egg mass data, supports Fong et al.'s conclusion. I ran a
14 simple linear regression on the GGNRA's available data set for egg masses surveyed at Horse
15 Stable Pond. This data set includes all known observations of egg masses at Horse Stable Pond,
16 but excludes egg masses from Laguna Salada because there has been inconsistent survey effort
17 by the City at Laguna Salada across time, making year-to-year trend analysis of Laguna
18 Salada's egg mass data ambiguous. The results of this analysis show that there has been no
19 discernable change in egg mass numbers at Horse Stable Pond over the past nine years.

20 63. I agree with Lisa Wayne's subsequent deposition testimony that there are no discernable
21 changes in CRLF egg mass numbers at Sharp Park. For example, when asked, "[d]o you have
22 an understanding of what the trend is of the population of red-legged frogs at Sharp Park?," she
23 responded "no." When she was asked, "What I want to make sure I understand is you can't
24 draw any conclusions on the population trends of Sharp Park based on the egg mass
25 observations of last year; is that right?," she responded "No. In one year, no." Wayne Dep., p.
26 249-50.

27 64. It is my professional opinion that pumping-induced habitat degradation at Sharp Park,
28 combined with the high probability of CRLF take events into the future, will cause the CRLF

1 population to become unstable, decline, and threaten the recovery of the entire Sharp Park/Mori
2 Point population. The defendants' and intervenors' declarants agree that Laguna Salada
3 currently provides poor breeding habitat for CRLF. For example, Dr. Jennings has stated that
4 "Laguna Salada and Horse Stable Pond are now completely choked with a thick and overgrown
5 mat of tules and cattails, displacing optimal frog breeding ground and resulting in less favorable
6 habitat for the Frog," Jennings Decl., p. 19, and Lisa Wayne has suggested that "[d]ense tule
7 and cattail growth, in particular, reduce the value of the habitat for CRLF breeding."⁵

8 65. What is missing from their statements is an explanation about why tule and cattail
9 growth is increasing. As explained by Dr. Peter Baye, this encroachment is directly attributable
10 to golf course pumping and water management. As water is drawn down by pumping to a
11 shallow depth, and kept within a narrow elevation band, tules and cattails, which cannot survive
12 in deeper waters, are able to grow and spread in the artificially shallow lagoon. This is directly
13 attributable to the artificial water levels imposed by golf course management, and the decline in
14 habitat quality described by the intervenors and the defendants is directly attributable to this
15 pumping-induced vegetation growth. I agree with Ms. Wayne's deposition testimony where she
16 stated that allowing water levels to increase at Sharp Park would prevent tules and cattails from
17 growing rapidly in Laguna Salada and Horse Stable Pond. Wayne Dep., p. 214-215.

18 66. Breeding habitat in Sharp Park has been declining due to succession caused by
19 artificially shallow and invariant water levels. Furthermore, juvenile recruitment at Sharp Park
20 is also low. How is it then possible that so many egg masses were laid at Sharp Park in 2011?
21 The answer lies neither in the City's failed Compliance Plan, nor in the pumping and mowing
22 threats that the golf course imposes on these species. Rather, the answer is found in the increase
23 in habitat via the creation of new ponds at Mori Point since 2005, and in recognizing the fact
24

25
26 ⁵ Laguna Salada's decreasing ability to sustain CRLF habitat over time is also indicated by the
27 failure to find CRLF tadpoles in the lagoon, 2008 Swaim report, p. 5.1, and the generally
28 fewer observations of juvenile CRLF in Laguna Salada relative to Horse Stable Pond. These
observations clearly indicate inadequate habitat conditions and recruitment problems for
CRLF in Laguna Salada.

1 that the CRLFs that occupy Sharp Park do not represent a population independent from the
2 CRLFs at Mori Point

3 67. Directly adjacent to Sharp Park, Mori Point's recently restored habitats are a
4 demonstrable population source that contributes to CRLF and SFGS production at Sharp Park
5 and Mori Point. In November 2004, the Fish and Wildlife Service, the Golden Gate Park
6 Conservancy and the Golden Gate Natural Research Area completed construction of two ponds
7 (Willow and Middle Ponds) at Mori Point to enhance amphibian habitat and provide foraging
8 opportunities for the SFGS (see Fong et al. 2010). In addition, in the fall of 2007 two larger
9 ponds (Wetland Pond [36 m ! 12 m] and Southern Pond [18 m ! 32 m]) were built at Mori
10 Point.

11 68. During this time period, CRLF egg masses and SFGS were surveyed at both Sharp Park
12 and Mori Point to determine the efficacy of the recovery efforts. The analysis of these surveys
13 showed, as discussed above, that egg mass counts in Horse Stable Pond over this time interval
14 showed no significant change—they were essentially stable. On the other hand, a statistically
15 significant increase in egg mass numbers exists over the 7-year interval 2003-2009 at Mori
16 Point (Fong et al. 2010, p. 6). Using the additional data for the most recent two years (2010 and
17 2011) obtained from the National Park Service, I ran a linear regression model on the Mori
18 Point egg mass data for the entire suite of years between 2003 and 2011. I was able to show
19 that a general increasing trend in egg mass counts at Mori Point—an indication that the CRLF
20 recovery there is working.

21 69. In sum, it is my professional opinion that any increase in egg masses observed in the
22 Sharp Park/Mori Point complex reflects continued increases in recruitment from the Mori Point
23 ponds. Yet because defendants' activities at Sharp Park are taking the CRLF in several ways,
24 including by adversely altering habitat conditions at Sharp Park, defendants activities are in fact
25 having negative population-level impacts on the entire Mori Point/Sharp Park CRLF population.
26 Indeed, to the extent that Sharp Park is now operating as a "population sink" due to defendants'
27 activities, the extensive efforts by NPS to recover the CRLF population are being directly
28 undermined and made far less effective than otherwise would be the case. Over the long term, it

1 is my view that these activities threaten the survival of the resident population and, if the
2 population is lost, the recovery of the entire species will be impeded.

3 70. Similarly, SFGS in the Mori Point/Sharp Park complex are being negatively impacted by
4 Sharp Park Golf Course's activities, while Mori Point's restoration work is helping the species
5 recover. As explained above, the GGNRA has invested in extensive recovery efforts at Mori
6 Point by constructing feeding habitats for the SFGS. A baseline survey was conducted before
7 these ponds were constructed, and follow-up surveys for SFGS in 2006 and 2008 were
8 implemented to determine the impact of the recovery effort.

9 71. The surveys were conducted by Swaim Biological, and published in a report entitled San
10 Francisco Garter Snake Habitat Improvement Project at Mori Point, Pacifica, California 2004-
11 2008. I have reviewed this report, and it appears that the SFGS population is in fact growing
12 because of the habitat restoration efforts at Mori Point. The Swaim report generally shows
13 greater numbers of SFGS over the interval 2004-2008, suggesting a recovery since the last
14 systematic surveys were conducted in the mid-1980s and early 1990s. The report itself
15 concludes that the "the long-term response of the SFGS population to the pond creation and
16 enhancement project will be positive." Yet as explained above, Sharp Park's actions act as a
17 "sink" on the overall population, and because the SFGS population is very small, the impact of
18 this sink has extreme import on the population as a whole. If the golf course activities are not
19 abated, it is my professional opinion that the SFGS population at Mori Point/Sharp Park will
20 likely go extinct, and the entire species will be jeopardized with extinction.

21
22 1/20/12
23 Date

s/Marc Hayes
24 Marc Hayes, Ph.D.

25 I, Brent Plater, hereby attest that Marc Hayes concurrence in the submission of this document
26 has been obtained.

27 Executed on: January 20, 2012

Brent Plater
28 Brent Plater

EXHIBIT A

CURRICULUM VITA

Marc Philip Hayes

Birthdate: 12 October 1950

Birthplace: Marysville, California

Nationality: American, first generation (French mother)

Specializations: I am a research herpetological ecologist. The large majority of my work has focused on the ecology of amphibians and reptiles. My work has emphasized aquatic herpetofauna; in particular, the ecology of western North American ranid frogs and Pacific Northwest stream-associated amphibians, fish-amphibian and gartersnake-amphibian interactions, and the ecology of the two Pacific coast turtle species. Most of my work also focuses on native species conservation.

Current Foci: Movement ecology of the northern red-legged frog (*Rana aurora*); the influence of predation on the movement patterns of ranid frogs; Oregon spotted frog (*Rana pretiosa*) ecology, demography and overwintering patterns; ecology of the stream-breeding Coastal tailed frog (*Ascaphus truei*); and influences of altered hydrologies on amphibian habitat use.

Education:

- 1991 PhD with distinction, University of Miami, Miami, Florida
Dissertation: Attendance in the tropical, leaf-breeding frog *Centrolenella fleischmanni* (Anura: Centrolenidae): A study in parental care.
Major Advisor: Jay M. Savage
- 1975 MA with highest honors, California State University, Chico, California
Thesis: Systematics and ecology of the California mountain kingsnake (*Lampropeltis zonata*).
Major Advisor: Frank S. Cliff
- 1972 BA University of California, Santa Barbara, California
- 1970 AA salutatorian, Yuba College, Marysville, California
- 1968 Diploma Yuba City High School, Yuba City, California

Teaching Experience:

- 2010 (April) Society of Wetland Scientists (SWS); Amphibian Management Workshop.
- 2009 (March) SWS; Amphibian ID & Habitat Assessment Workshop.
- 1999 (spring) Portland State University; Vertebrate Zoology (BI 387); lecture and lab.
- 1999 (June) Bureau of Land Management, Klamath Falls; Workshop on Amphibian and Reptile ID and Habitat Evaluation.
- 1998 (June) Portland State University; Field Herpetology (BI 505); lecture and lab; techniques course.
- 1992-8 Portland Community College; Biology [for non-majors] (BI 101,102,103); Principles of Biology [for majors] (BI 211,212,213), and Habitat courses (BI 141[Forest], BI 142[Aquatic], BI 143[Marine]); lecture and lab in all except BI 101 and 103, where lab only.

- 1996 US Fish and Wildlife Service and Willamette National Forest; Workshop on ecology of the Oregon spotted frog (*Rana pretiosa*).
- 1996 (spring) Workshop on the western pond turtle (*Clemmys marmorata*); US Fish and Wildlife Service.
- 1995 (spring) Portland State University; Herpetology (BI 413/513); lecture and lab; team taught with Drs. Richard Forbes and Stanley Hillman.
- 1993 (spring) Pacific University; Behavioral Statistics (PSY 350); lecture and lab.
- 1993 (spring) Oregon Zoo; Taught a ZooUniversity course on Amphibian Ecology.
- 1992 (fall) Oregon Zoo; Taught a ZooUniversity course on Arctic Ecology.
- 1983-1986 University of Miami; Taught the laboratory sections of courses in Elementary Ecology (BSC 103) and General Biology (BSC 111/112). [both lower division college courses.]
- 1978-1982 University of Southern California; As a teaching assistant, taught laboratory sections in Ecology and Evolutionary Biology (BIO 215), Fundamentals of Vertebrate Biology (BIO 302), General Biology (BIO 106L), and Genetics (BIO 210) and Humans and their Environment (BIO 102) [all lower division college courses]; and taught lecture and lab in Ornithology (BIO 477L) and Herpetology (BIO 543L). [both upper division and graduate college courses]
- 1976-1978 Butte College; Taught Environmental Quality Protection (ESC 200) [lecture course]; Field Biology (BIO 205), Field Botany (BIO 204), Human Anatomy (BIO 220), and Human Physiology (BIO 221) [lab and lecture for all courses], and Natural History of Butterfly Botanical Area (INP 100) [field course]. [all were lower division college-level courses].
- 1975 (spring) Bureau of Land Management, northern California; Taught Amphibian and Reptile Identification/Ecology Workshop.
- 1974-1975 California State University, Chico; As teaching assistant, taught laboratory sections in General Zoology (BIO 107) and Human Anatomy (BIO 122) [both lower division college-level courses].

Work Experience:

- 2006-present Senior Research Scientist, Science Team, Habitat Program, Washington Department of Fish and Wildlife; Expanded responsibilities addressing adaptive management research on amphibians in headwater streams; coordinate multi-state co-operation for Recovery of the Oregon spotted frog.
- 2001-2003 Conducted overwintering study of the Oregon spotted frog at Conboy Lake National Wildlife Refuge; Washington State Department of Transportation (sponsor).
- 2000-2002 Research Scientist, Science Team, Habitat Program, Washington Department of Fish and Wildlife; Primary responsibility addresses leading adaptive management research on amphibians in headwater streams to ultimately test whether the patch buffers prescribed in the statewide Forest

- and Fish Agreement are effective in protecting the resources in headwater streams through timber harvest rotations.
- 2000- Bullfrog selectivity study; on-going work at Conboy Lake National Wildlife Refuge designed to determine whether bullfrogs exhibit any dietary selectivity (positive or negative), especially with respect to the Oregon spotted frog as prey; w/ Christopher A. Pearl and R. Bruce Bury, US Fish and Wildlife Service (sponsor).
- 2000-2001 Oregon spotted frog demographic study; on-going work at Conboy Lake National Wildlife Refuge designed to determine whether significant larger Oregon spotted frogs found at Conboy exhibit differences in growth or age population from those elsewhere, US Fish and Wildlife Service and The Wildlife Society (sponsors).
- 1999-2002 Coordinator and Scientific Lead; Rivergate Project; Leading 10-person team in an on-going ecosystem study of South Rivergate Corridor (Lower Columbia River) with focus on western painted turtle (*Chrysemys picta*); Port of Portland (sponsor).
- 1999-2002 Northern red-legged frog (*Rana aurora aurora*) movement study; work on the Tiller Ranger District of the Umpqua National Forest (southwestern Oregon) designed to determine seasonal spatial patterns of habitat utilization; w/ Christopher A. Pearl and Christopher J. Rombough, Oregon Zoo and the Umpqua National Forest (sponsors).
- 1999-2001 Northern red-legged frog (*Rana aurora aurora*) overwintering study; work at Burlington Bottoms (Lower Columbia River) designed to determine overwintering patterns; w/ Dr. Peter I. Ritson, US Fish and Wildlife Service (sponsor).
- 1996-2001 Herpetological Scientific Advisor, North Umpqua Hydroelectric Project; Scientific advisor during FERC relicensing on dynamics of hydrological modifications as influencing the amphibian and reptile fauna of the North Umpqua Hydroelectric Project; Advisor for Stillwater Sciences, Berkeley, California.
- 1999-2000 Oregon spotted frog/bullfrog habitat partitioning study; on-going work at Conboy Lake National Wildlife Refuge designed to determine how habitat utilization of the Oregon spotted frog and bullfrog differ; w/ Joseph D. Engler, US Fish and Wildlife Service (sponsor).
- 1998-2000 Co-operator on movement and overwintering study of the Columbia spotted frog (*Rana luteiventris*); w/ Dr. Evelyn Bull, Pacific Northwest Forest Range and Experiment Station, La Grande.
- 1998-2001 Co-operator on study of headwater stream amphibians that builds an empirically based model of amphibian response in undisturbed versus disturbed (timber harvested) situations; w/ Stillwater Sciences (consultants); NCASI (sponsor), timber industry-funded entity addressing major environmental issues.

- 1998-9 Oregon spotted frog overwintering study; pilot study design to identify basic overwintering patterns; US Fish and Wildlife Service (sponsor).
- 1996 Expert panelist; Amphibians and reptiles; Habitat-Species project; Numerous sponsors collectively led by David Johnson and Tom O'Neill, respectively, with the Washington and Oregon Departments of Fish and Wildlife.
- 1987-1988 Laboratory Coordinator; Organized and coordinated teaching assistants and laboratory technicians in teaching, lab prep, and testing for General Biology (BSC 111/112) at University of Miami.
- 1972-1997 Researcher, co-operator, participant in over 60 ecological projects for various federal, state, local and private entities.
- Other Experience:**
- 2011- Member, Washington State Aquatic Nuisance Species Guidance Committee; committee formulates policy and addresses approaches for dealing with exotic and nuisance aquatic species.
- 2010- Adjunct Professor, Central Washington University, Ellensburg, Washington. Serving on Committee for Brandon Fessler Masters Degree Candidate working on the movement ecology of the Coastal giant salamander (*Dicamptodon tenebrosus*).
- 2007- Adjunct Professor, University of Washington, Department of Fisheries, Served on Committee for Amy Yahnke, who complete a Masters Degree on stillwater amphibian ecology in stormwater ponds; and serving on Committee for Amy Yahnke, PhD candidate working on contaminants affecting amphibians in stormwater ponds.
- 2002- Affiliate Curator, Herpetology, University of Washington Burke Museum. Herpetological collection research and curation.
- 2001-2006 Adjunct Professor, The Evergreen State College, Olympia, Washington. Served on Committee's for Jennifer Serra Shean and Joanne Schuett-Hames, both graduate students that completed Masters theses on the movement ecology of Northern red-legged frogs (*Rana aurora*).
- 2001-2009 Herpetological Review, Section Editor, Natural History Notes, Herpetological Review; editor for natural history notes on amphisbaenids, crocodylians, lizards, and tuataras (*Sphenodon*).
- 2000- Committee Member for two Master's level student projects at The Evergreen State College addressing northern red-legged frog movement and habitat utilization ecology.
- 2000-2001 Panel Member, Washington State Aquatic Nuisance Species Committee; committee addresses all issues regarding all categories of exotic animal and plant nuisance species ranging from immediate problems to education to research.
- 1998-2000 Panel Member, Wildlife Integrity Committee of the Oregon Department of Fish and Wildlife; committee developed scientifically based designations for imported and exotic wildlife.

- 1992- Adjunct Assistant, then Adjunct Associate Professor (1995-), Portland State University; served on Committees for Aaron Borisenko, a graduate student who obtained a Master's degree on the status of the Foothill yellow-legged frog (*Rana boylei*) in Oregon; and Catherine Callison, a graduate study who obtained a Master's degree on the Northern red-legged frog oviposition behavior and ecology.

Posters and Presentations:

- 2009 "Amphibian production in stormwater detention ponds, King County, Washington." presented at the 2009 Joint Annual Meeting of the Society for Northwestern Vertebrate Biology and Washington Chapter of the Wildlife Society held at Skamania Lodge, Stevenson, Washington, February 18-21, 2009. w/ Amy Yahnke and Christain Grue. (contributed poster)
- 2009 "Sex-specific identification of *Ascaphus truei* at maturity." presented at the 2009 Joint Annual Meeting of the Society for Northwestern Vertebrate Biology and Washington Chapter of the Wildlife Society held at Skamania Lodge, Stevenson, Washington, February 18-21, 2009. w/ April Barreca and Teal Waterstrat. (contributed poster)
- 2009 "Torrent Salamander movement ecology: perspective on a 'sedentary' species." Abstracts from the 2009 Joint Annual Meeting of the Society for Northwestern Vertebrate Biology and Washington Chapter of the Wildlife Society held at Skamania Lodge, Stevenson, Washington, February 18-21, 2009. w/ Julie Tyson. (contributed poster)
- 2007 "Species identification and body size estimation of amphibians in Washington State based on foot morphology. Abstracts from the 2007 Annual Meetings of the Society for Northwestern Vertebrate Biology, Northwest Scientific Association and Northwest Lichenologists held jointly at Harbour Towers & Suites, Victoria, BC, February 21-24, 2007. Northwest Naturalist 88:101-127. (contributed poster)
- 2007 "Comparative diet of three species of terrestrial forest-dwelling amphibians (*Rana aurora*, *Dicamptodon tenebrosus*, and *Rhyacotriton kezeri*) in western Washington." Abstracts from the 2007 Annual Meetings of the Society for Northwestern Vertebrate Biology, Northwest Scientific Association and Northwest Lichenologists held jointly at Harbour Towers & Suites, Victoria, BC, February 21-24, 2007. w/ Casey Richart and Ryan O'Donnell. (contributed talk)
- 2007 "Differentiating *Ascaphus truei* at sexual maturity." presented at the 2007 Annual Meetings of the Society for Northwestern Vertebrate Biology, Northwest Scientific Association and Northwest Lichenologists held jointly at Harbour Towers & Suites, Victoria, BC, February 21-24, 2007. w/ April Barreca and Teal Waterstrat. (contributed talk)
- 2006 "Trends in the breeding population of Oregon Spotted Frog (*Rana pretiosa*) at Conboy Lake National Wildlife Refuge. Abstracts from the 2006 Annual Meeting of the Society for Northwestern Vertebrate Biology

- and the Washington Chapter of the Wildlife Society held jointly at Evergreen State College, Washington, March 27-April 1, 2006. w/ Joseph Engler and Christopher Rombough. (contributed talk)
- 2006 "Washington terrestrial slugs and snails." presented at the 2006 Annual Meeting of the Society for Northwestern Vertebrate Biology and the Washington Chapter of the Wildlife Society held jointly at Evergreen State College, Washington, March 27-April 1, 2006. w/ Casey Richart and William Leonard. (contributed poster)
- 2006 "Dispersion of Coastal Tailed Frog (*Ascaphus truei*): A hypothesis relating occurrence of frogs in non-fishbearing headwater basins to their seasonal movements." presented at the 2006 Annual Meeting of the Society for Northwestern Vertebrate Biology and the Washington Chapter of the Wildlife Society held jointly at Evergreen State College, Washington, March 27-April 1, 2006. w/ Timothy Quinn, Daniel Dugger, and Tiffany Hicks. (invited talk)
- 2006 "Torrent Salamander distribution within headwater streams." presented at the 2006 Annual Meeting of the Society for Northwestern Vertebrate Biology and the Washington Chapter of the Wildlife Society held jointly at Evergreen State College, Washington, March 27-April 1, 2006. w/ Amberlynn Pauley, Stephen West and Marty Raphael. (contributed poster)
- 2005 "Foothill Yellow-legged Frog abundance in Cow Creek." Abstracts from the 2005 Annual Meeting of the Society for Northwestern Vertebrate Biology and the Oregon Chapter of the Wildlife Society held jointly at Corvallis, Oregon, February 22-25, 2005. w/ Christopher Rombough and Nancy Duncan. (contributed talk)
- 2005 "Columbia Torrent Salamander (*Rhyacotriton kezeri*) occurrence in headwater streams: the importance of water," presented at the 2005 Annual Meeting of the Society for Northwestern Vertebrate Biology and the Oregon Chapter of the Wildlife Society held jointly at Corvallis, Oregon, February 22-25, 2005. w/ Daniel Dugger and Timothy Quinn. (contributed talk)
- 2005 "*Plethodon* Salamander occupancy in managed landscapes in southwest Washington." presented at the 2005 Annual Meeting of the Society for Northwestern Vertebrate Biology and the Oregon Chapter of the Wildlife Society held jointly at Corvallis, Oregon, February 22-25, 2005. w/ Aimee McIntyre, Timothy Quinn, Daniel Dugger, and Tiffany Hicks. (contributed talk)
- 2003 "Population changes in the Oregon spotted frog at Conboy National Wildlife Refuge: The pivotal role of hydrology", presented at the 2003 Annual Meeting of the Washington Chapter of The Wildlife Society in Port Townsend, Washington, April 15-17 w/ Joseph D. Engler. (invited talk).
- 2003 "Comparing Amphibian Sampling Methods: Which is Best for Headwater Streams?", presented at Amphibian Sampling Symposium at the 2003 Annual Meeting of the Society for Northwestern Vertebrate Biology in

- Arcata, California, March 19-22. w/ Daniel J. Dugger, Tiffany L. Hicks, and Timothy Quinn. (invited talk).
- 2003 "Headwater Habitat Variation: Its Relationship to Stream Amphibian Distribution", presented at the 2003 Annual Meeting of the Society for Northwestern Vertebrate Biology in Arcata, California, March 19-22. w/ Daniel J. Dugger, Tiffany L. Hicks, and Timothy Quinn (invited poster).
- 2003 "Headwater Habitat Variation: Its Relationship to Stream Amphibian Distribution", presented at the 2003 Annual Meeting of the Society for Northwestern Vertebrate Biology in Arcata, California, March 19-22. w/ Daniel J. Dugger, Tiffany L. Hicks, and Timothy Quinn (invited poster).
- 2000 "Egg attendance in the frog genus *Hyalinobatrachium*: Function and Phylogenetic Implications", part of the Symposium on Ecology and Evolution in the Tropics: Essays in Tribute to Jay M. Savage, presented at the 80th Annual Meeting of the American Society of Ichthyologists and Herpetologists in La Paz, Mexico, June 14-20. w/ Roy W. McDiarmid (invited talk).
- 2000 "Oregon spotted frog *Rana pretiosa* oviposition: Conservation Implications", presented at the 80th Annual Meeting of the American Society of Ichthyologists and Herpetologists in La Paz, Mexico, June 14-20. w/ Joseph D. Engler (contributed talk).
- 2000 "Oviposition patterns in the northern red-legged frog: Factors in site choice", presented at the 80th Annual Meeting of the American Society of Ichthyologists and Herpetologists in La Paz, Mexico, June 14-20. w/ Christopher J. Rombough, presenter (contributed talk).
- 2000 "Foothill yellow-legged frog *Rana boylei* decline in Oregon: Conservation implications", presented at the 80th Annual Meeting of the American Society of Ichthyologists and Herpetologists in La Paz, Mexico, June 14-20. w/ Aaron N. Borisenko, presenter (contributed talk).
- 2000 "Oregon spotted frog *Rana pretiosa* oviposition: Conservation Implications", part of the Symposium on Terrestrial and Riparian Amphibians, presented at the year 2000 Joint Annual Meeting of the Society for Northwestern Vertebrate Biology and the Washington Chapter of the Wildlife Society in Ocean Shores, Washington, March 15-17. w/ Joseph D. Engler (invited talk).
- 1999 "Oregon spotted frog in the Klamath Basin: History and Ecology"; Third Klamath Basin Ecological Conference, sponsored by the Klamath Basin Ecological Restoration Office (invited talk)
- 1999 "Oregon spotted frog oviposition: Conservation implications"; First Annual Northwest Conservation Research Consortium, sponsored by the Oregon Zoo (invited talk)
- 1998 "Oregon spotted frog: History and current ecology"; Symposium on the spotted frogs of Oregon, sponsored by US Fish and Wildlife Service (invited talk)

- 1998 "Vulnerability to predation of the Oregon spotted frog to the bullfrog"; Annual meeting of the Society for Northwestern Vertebrate Biology (contributed talk)
- 1998 "The status of Oregon spotted frog across its geographic range"; Joint annual meeting of the ASIH, Herpetologists League, and SSAR (invited poster)
- 1997 "The egg-laying reptile fauna of the Squaw Flat Research Natural Area: Implications for forest management"; The Wildlife Society annual regional meeting, Bend, Oregon (invited talk)
- 1997 "Vulnerability of the postmetamorphic stages of the Oregon spotted frog"; The Wildlife Society annual regional meeting, Bend, Oregon (contributed talk)
- 1975-1996 Over 30 invited talks and two invited posters, mostly on various aspects of amphibian ecology and conservation.

Publications

- Tidwell, K.S., D.J. Shepherdson, and M.P. Hayes. Inter-population variability in evasive behavior in the Oregon Spotted Frog (*Rana pretiosa*). *Journal of Herpetology* (in review)
- Padgett-Flohr, G., and M.P. Hayes. 2011. Assessment of the vulnerability of the Oregon spotted frog (*Rana pretiosa*) to the Amphibian chytrid fungus (*Batrachochytrium dendrobatidis*). *Herpetological Conservation and Biology* 6(2):99-106.
- Conlon, J.M., M. Mechkaraska, E. Ahmeda, L. Coquet, T. Jouenne, J. Leprince, H. Vaudry, M.P. Hayes, and G. Padgett-Flohr. 2011. Host defense peptides in skin secretions of the Oregon spotted frog *Rana pretiosa*: Implications for species resistance to chytridiomycosis. *Developmental and Comparative Immunology* 35:644-649.
- Palmeri-Miles, A.F., K.A. Douville, J.A. Tyson, K.D. Ramsdell and M.P. Hayes. 2010. Field observations of oviposition and early development of the Coastal Tailed Frog (*Ascaphus truei*). *Northwestern Naturalist* 91(2):206-213.
- Hayes, M.P., C.J. Rombough, G.E. Padgett-Flohr, L.A. Hallock, J.E. Johnson, R.S. Wagner, and J.D. Engler. 2009. Amphibian chytridiomycosis in the Oregon spotted frog (*Rana pretiosa*) in Washington State, USA. *Northwestern Naturalist* 90(2):148-150.
- McIntyre, A.P., M.P. Hayes and T. Quinn. 2009. *Type N Feasibility Study*. A report submitted to the Landscape and Wildlife Advisory Group, Amphibian Research Consortium, and the Cooperative Monitoring, Evaluation, and Research Committee. Washington Department of Fish and Wildlife, Olympia, Washington. 48 pp. + appendices
- Ricketts, N.L., and M.P. Hayes. 2009. *2009 Pilot Citizen Science Stillwater Amphibian Protocol Summary Report*. Washington Department of Fish and Wildlife, Olympia, Washington. 33 pp. + appendices
- Curry, T.R. and M.P. Hayes. 2009. *Rana aurora* (Northern Red-legged Frog) life history disturbance. *Herpetological Review* 40(2):208-209.
- Kroll, A.J., M.P. Hayes, and J.G. MacCracken. 2009. Concerns regarding the use of amphibians as metrics of critical biological thresholds: a comment on Welsh and Hodgson (2008). *Freshwater Biology* 54(11):2364-2373.
- Tyson, J.A., K.A. Douville and M.P. Hayes. 2009. *Rhyacotriton olympicus* (Olympic Torrent Salamander). Maximum larval size. *Herpetological Review* 40(1):67
- Lund, B.M., M.P. Hayes, T.R. Curry, J.S. Marsten, and K.R. Young. 2008. Predation on the Coastal Tailed Frog (*Ascaphus truei*) by a shrew (*Sorex* spp.) in Washington State. *Northwestern Naturalist* 98(2):200-202.
- Hayes, M.P.; T. Quinn; K.O. Richter; J.P. Schuett-Hames; and J.T. Serra Shean. 2008. Maintaining Lentic-Breeding Amphibians in Urbanizing Landscapes: The Case Study of the Northern Red-Legged Frog (*Rana aurora*). Pp. 445-461. In: Mitchell, J.C., R.E. Jung Brown, and B. Bartholomew (editors), *Urban Herpetology*, Society for the Study of Amphibians and Reptiles, Herpetological Conservation 3. [Book chapter]
- Hayes, M.P., T. Quinn, and T.L. Hicks. 2008. *Implications of Capitol Lake Management for Fish and Wildlife*. Report to the Washington State Department of General Administration, Olympia, Washington. 88 pp. + appendices
- Hayes, C.B., and M.P. Hayes. 2008. *Elgaria coerulea* (Northern Alligator Lizard). Juvenile growth. *Herpetological Review* 39(2):222-223.
- Hicks, T.L., D.E. Mangan, A.P. McIntyre and M.P. Hayes. 2008. *Rhyacotriton kezeri* larval diet. *Herpetological Review* 39(4): 456-457.
- Rombough, C.J. and M.P. Hayes. 2008. *Rana pretiosa* (Oregon Spotted Frog). Reproduction. *Herpetological Review* 39(3):340-341.
- Waterstrat, F.T., A.P. McIntyre, M.P. Hayes, K.M. Phillips, and T.R. Curry. 2008. *Ascaphus truei* (Coastal Tailed Frog). Atypical Amplexus. *Herpetological Review* 39(4):458.
- Richart, C.H., M.P. Hayes and R.P. O'Donnell. 2007. Comparative diet of three species of terrestrial forest-dwelling amphibians (*Rana aurora*, *Dicamptodon tenebrosus*, and *Rhyacotriton kezeri*) in western Washington. *Northwestern Naturalist* 88(2):121-122. [abstract]
- Quinn, T.; Hayes, M.P.; D.J. Dugger; T.L. Hicks; and A. Hoffmann. 2007. Comparison of two techniques for surveying headwater stream amphibians. *Journal of Wildlife Management* 71(1):282-288.
- Barreca, A.B., F.T. Waterstrat, and M.P. Hayes. 2007. Differentiating *Ascaphus truei* at sexual maturity. *Northwestern Naturalist* 88(2):102-103. [abstract]
- O'Donnell, R.P., T. Quinn, M.P. Hayes and K.E. Ryding. 2007. Comparison of three methods for surveying amphibians in forested seep habitats in Washington State. *Northwest Science* 81(4):274-283.
- Hayes, M.P. 2007. Size record? *Herpetological Review* 38(4):393.
- Rombough, C.J. and M.P. Hayes. 2007. *Rana boylei* (Foothill Yellow-legged Frog). Reproduction. *Herpetological Review* 38(1):70-71.

- Waterstrat, F.T., R.L. Crawford, and M.P. Hayes. 2007. *Ascaphus truei* (Tailed Frog). Spider Prey. *Herpetological Review* 38(3):318.
- Hayes, M.P., C.J. Rombough and C.B. Hayes. 2007. *Rana aurora* (Northern Red-legged Frog). Movement. *Herpetological Review* 38(2):192-193.
- Hayes, M.P.; T. Quinn; D.J. Dugger, T.L. Hicks; M.A. Melchioris; and D.E. Runde. 2006. Dispersion of coastal tailed frog (*Ascaphus truei*): An hypothesis relating occurrence of frogs in non-fish-bearing headwater basins to their seasonal movements. *Journal of Herpetology* 40(4):531-543.
- Hayes, M.P., T. Quinn, D.J. Dugger, and T.L. Hicks. 2006. Dispersion of Coastal Tailed Frog (*Ascaphus truei*): A hypothesis relating occurrence of frogs in non-fishbearing headwater basins to their seasonal movements. *Northwestern Naturalist* 87(2):171-172. [abstract]
- Karraker, N.E., D.S. Pilliod, E.L. Bull, P.S. Corn, L.V. Diller, L.A., Dupuis, M.P. Hayes, B.R. Hossack, G.R. Hodgson, E.J. Hyde, K. Lohman, B.R. Norman, L.M. Ollivier, C.A. Pearl, C.R. Peterson. 2006. Taxonomic variation in the oviposition by Tailed Frogs (*Ascaphus* spp.). *Northwestern Naturalist* 87(2):87-97.
- Hayes, M.P., J.D. Engler, and C.J. Rombough. 2006. Trends in the breeding population of the Oregon spotted frog (*Rana pretiosa*) at Conboy Lake National Wildlife Refuge. *Northwestern Naturalist* 87(2):171. [Abstract]
- Hayes, M.P., J.D. Engler and C.J. Rombough. 2006. *Rana pretiosa* (Oregon Spotted Frog). Predation. *Herpetological Review* 37(2):209-210.
- Hayes, M.P., M.R. Jennings, and G.B. Rathbun. 2006. *Rana draytonii* (California red-legged frog). Prey. *Herpetological Review* 37(4):449.
- Price, R.F., D.J. Dugger, T.L. Hicks and M.P. Hayes. 2006. *Dicamptodon copei* (Cope's Giant Salamander). Predation. *Herpetological Review* 37(4):436-437.
- Rombough, C.J., M.P. Hayes and J.D. Engler. 2006. *Rana pretiosa* (Oregon Spotted Frog). Maximum size. *Herpetological Review* 37(2):210.
- Richart, C.H., M.P. Hayes and W.P. Leonard. 2006. Washington terrestrial slugs and snails. *Northwestern Naturalist* 87(2):184. [abstract]
- Hayes, M.P., and L.L.C. Jones. 2005. *Rhyacotriton olympicus*. Pp. 880-882. In: Lannoo, M.J. (editor), *Amphibian Declines: The Conservation Status of United States Species*. University of California Press, Berkeley. [Book section]
- Hayes, M.P. and T. Quinn. 2005. *Rhyacotriton kezeri*. Pp. 876-880. In: Lannoo, M.J. (editor), *Amphibian Declines: The Conservation Status of United States Species*. University of California Press, Berkeley. [Book section]
- Hayes, M.P. 2005. *Rhyacotriton cascadae*. Pp. 874-876. In: Lannoo, M.J. (editor), *Amphibian Declines: The Conservation Status of United States Species*. University of California Press, Berkeley. [Book section]
- Pearl, C.A., and M.P. Hayes. 2005. *Rana pretiosa*. Pp. 577-580. In: Lannoo, M.J. (editor), *Amphibian Declines: The Conservation Status of United States Species*. University of California Press, Berkeley. [Book section]
- Jennings, M.R. and M.P. Hayes. 2005. *Rana boylei* (Foothill Yellow-legged Frog). Distribution. *Herpetological Review* 36(4):438.

- Rombough, C.J., M.P. Hayes, N.L. Duncan. 2005. Foothill Yellow-legged Frog abundance in Cow Creek. *Northwestern Naturalist* 86(2):114-115.
- Dugger, D.J., M.P. Hayes, T. Quinn. 2005. Columbia Torrent Salamander (*Rhyacotriton kezeri*) occurrence in headwater streams: the importance of water. *Northwestern Naturalist* 86(2):92. [abstract]
- Hayes, M.P., A.P. McIntyre, T. Quinn, D.J. Dugger, and T.L. Hicks. 2005. *Plethodon* salamander occupancy in managed landscapes in southwest Washington. *Northwestern Naturalist* 86(2):98. [abstract]
- Rombough, C.J., and M.P. Hayes. 2005. Novel aspects of oviposition site preparation by female foothill yellow-legged frogs (*Rana boylei*). *Northwestern Naturalist* 86:157-160.
- Rombough, C.J., J. Chastain, A.M. Schwab and M.P. Hayes. 2005. *Rana boylei* (Foothill Yellow-legged Frog). Predation. *Herpetological Review* 36(4):438-439.
- Eaton-Mordas, A., E.P. Urling, M.P. Hayes, D.J. Dugger, and T. Quinn. 2003. *Plethodon dunni*, *Plethodon vehiculum* (Dunn's Salamander, Western Red-backed Salamander). Behavior. *Herpetological Review* 34(1):54-55.
- Hayes, M.P., and C.B. Hayes. 2004. *Rana aurora aurora* (Northern red-legged frog): Vocalizations. *Herpetological Review* 35(1):52-53.
- Hayes, M.P., and C.B. Hayes. 2004. *Bufo boreas boreas* (Boreal toad): Behavior. *Herpetological Review* 35(4):369-370.
- Hayes, M.P., and C.B. Hayes. 2003. *Rana aurora aurora* (Northern red-legged frog): Juvenile Growth and Male Size at Maturity. *Herpetological Review* 34(3):112-133.
- Hayes, M.P. and C.B. Hayes. 2003. *Ensatina eschscholtzii oregonensis* (Oregon Ensatina). Colonization. *Herpetological Review* 34(1):45-46.
- Pearl, C.A. and M.P. Hayes. 2002. Predation by Oregon Spotted Frog (*Rana pretiosa*) on Western Toads (*Bufo boreas*) in Oregon. *American Midland Naturalist* 147(1):145-152.
- Bull, Evelyn; and M.P. Hayes. 2002. Overwintering of Columbia spotted frogs (*Rana luteiventris*) in northeastern Oregon. *Northwest Science* 76(2):141-147.
- Hayes, M.P., C.A. Pearl, and C.J. Rombough. 2001. *Rana aurora aurora*: Movement. *Herpetological Review* 32(1):35-36.
- Bull, Evelyn; and M.P. Hayes. 2001. Post-breeding movements of Columbia spotted frogs (*Rana luteiventris*) in northeastern Oregon. *Western North American Naturalist* 61(1):119-123.
- Altman, R.; M.P. Hayes, R.D. Forbes, and S.D. Janes. 2001. Chapter 10: Wildlife communities of westside grassland and chaparral. In: D.H. Johnson and T. O'Neill (editors), *Habitat-Species Relationships of Oregon and Washington*, Oregon State University Press. [Book chapter]
- Hayes, M.P., J.D. Engler, S. Van Leuven, D.C. Friesz, T. Quinn, and D.J. Pierce. 2001. Overwintering of the Oregon Spotted Frog (*Rana pretiosa*) at Conboy Lake National Wildlife Refuge, Klickitat County, Washington, 2000-2001. Final

- Report to the Washington Department of Transportation, Washington Department of Fish and Wildlife, Olympia, Washington. 38 pp.
- Bull, E.L., and M.P. Hayes. 2000. Livestock effects on reproduction of the Columbia spotted frog. *Journal of Range Management* 53(3):291-294.
- Hayes, M.P.; M.R. Jennings; and J.D. Mellen. 1998. Beyond mammals: Environmental enrichment for amphibians and reptiles. Pp. 205-235. In: Hutchinson, M.; J. Mellen; and D. Shepherdson (editors), *Second Nature: Environmental enrichment for captive animals*, Smithsonian Institution Press, Washington, D.C. [Book chapter]
- Mellen, J.D.; M.P., Hayes, M.P.; and D.J. Shepherdson. 1998. Captive environments for small felids. Pp. 184-201. In: Hutchinson, M.; J. Mellen; and D. Shepherdson (editors), *Second Nature: Environmental enrichment for captive animals*, Smithsonian Institution Press, Washington, D.C. [Book chapter]
- Hayes, M.P. 1997. Counting annuli. Pp. 37-38. In: R.B. Bury and J.R. Sisk (editors), *Western pond turtle: Biomonitoring and Survey Plan*. Publication of the Western Pond Turtle Working Group.
- Jennings, M.R., and M.P. Hayes. 1994. Decline of ranid frogs in the desert southwest. Pp. 183-212. In: Brown, P.R., and J.W. Wright (editors), *Proceedings of a Symposium on the Herpetology of North American Deserts*, Southwestern Herpetological Society, Special Publication (5).
- Jennings, M.R., and M.P. Hayes. 1994. Amphibians and reptiles of special concern in California. Final report submitted to The California Department of Fish and Game, Inland Fisheries Division, 1701 Nimbus Road, Rancho Cordova, CA 95701 under Contract Number 8023. 255 pp.
- Hayes, M.P. 1994. The status of the spotted frog (*Rana pretiosa*) in western Oregon. Oregon Department of Fish and Wildlife Technical Report 94-2:1-11. + appendices.
- Hayes, M.P. 1994. The spotted frog (*Rana pretiosa*) in western Oregon. Oregon Department of Fish and Wildlife Technical Report 94-1:1-30. + appendices
- Holland, D.C., M.P. Hayes, and E. McMillan. 1990. Late summer movement and mass mortality in the California tiger salamander (*Ambystoma californiense*). *The Southwestern Naturalist* 35(2):217-220.
- Hayes, M.P., J.A. Pounds, and W.W. Timmerman. 1989. An annotated list and guide to the amphibians and reptiles of Monteverde, Costa Rica. SSAR Herpetological Circular (17):1-67.
- Hayes, M.P., and M.R. Jennings. 1989. Patterns in the commercial exploitation of frogs. *Proceedings of the First World Congress of Herpetology*, University of Kent, Canterbury, England. [Abstract]
- Hayes, M.P., J. Le Corff, and R. Gaby. 1989. SSAR Life History Notes: *Gopherus polyphemus*. SSAR Herpetological Review 20(2):55-56.
- Hayes, M.P., and M.R. Jennings. 1989. Habitat correlates of distribution of the California red-legged frog (*Rana aurora draytonii*) and the foothill yellow-legged

- frog (*Rana boylei*): Implications for management. Pp. 144-156. In: Hayes, M.P., K.E. Severson, and D.R. Patton (technical coordinators): *Proceedings of the Symposium on the Management of amphibians, reptiles, and small mammals in North America* [July 19-21, 1988 - Flagstaff, Arizona], USDA General Technical Report RM-166:1-458.
- Hayes, M.P., and P.N. Lahanas. 1987. Nesting of the aquatic salamander *Amphiuma means*. *Florida Scientist* 50(Supplement 1):16. [Abstract]
- Hayes, M.P., J.A. Pounds, and D.A. Robinson. 1986. The fringe-limbed treefrog, *Hyla fimbriemembra*: New records from Costa Rica. *Florida Scientist* 49(3):193-198.
- Hayes, M.P., and D.C.F. Rentz. 1986. Observations on the biology of the Neotropical katydid *Haemodiasma tessellata* Brunner (Orthoptera: Tettigonidae). *Entomological News* 97(5):222-224.
- Hayes, M.P., and M.R. Jennings. 1986. Declines of ranid frogs in western North America: Are bullfrogs responsible? *Journal of Herpetology* 20(4):490-509.
- Hayes, M.P., and D. M. Krempels. 1986. Vocal sac variation among frogs of the genus *Rana* in western North America. *Copeia* 1986(4):927-936.
- Hayes, M.P. 1986. Selection against frequent brooding in a leaf-breeding frog. *American Zoologist* 26(4):7A. [Abstract]
- Hayes, M.P., and F.C. Shaffner. 1986. Life history notes: *Rana catesbeiana*. SSAR *Herpetological Review* 17(2):44-45.
- Miyamoto, M.M., M.P. Hayes, and M.R. Tennant. 1986. Biochemical and morphological variation in Floridan populations of the bark anole (*Anolis distichus*). *Copeia* 1986(1):76-86.
- Hayes, M.P., and J. Warner. 1985. Life history notes: *Rana catesbeiana*. SSAR *Herpetological Review* 16(4):109.
- Hayes, M.P. 1985. Life history notes: *Coluber constrictor priapus*. SSAR *Herpetological Review* 16(3):78.
- Hayes, M.P., and M.R. Tennant. 1985. The diet and feeding behavior of the California red-legged frog (*Rana aurora draytonii*). *Southwestern Naturalist* 30(4):601-605.
- Hayes, M.P. 1985. Geographic distribution: *Centrolenella euknemus*. SSAR *Herpetological Review* 16(2):59.
- Hayes, M.P., and D. M. Krempels. 1985. Geographic distribution: *Centrolenella vireovittata*. SSAR *Herpetological Review* 16(1):31.
- Jennings, M.R., and M.P. Hayes. 1985. Pre-1900 overharvest of California red-legged frogs (*Rana aurora draytonii*): The inducement for (*Rana catesbeiana*) introduction. *Herpetologica* 41(1):94-103.
- Hayes, M.P. 1985. Nest structure and attendance in the stream-dwelling frog, *Eleutherodactylus angelicus*. *Journal of Herpetology* 19(1):168-169.
- Hayes, M.P., and M.M. Miyamoto. 1984. Biochemical, behavioral, and body size differences between the red-legged frogs, *Rana aurora aurora* and *Rana aurora draytonii*. *Copeia* 1984(4):1018-1022.

- Hayes, M.P. 1983. A technique for partitioning hatching and mortality estimates in leaf-breeding frogs. *Herpetological Review* 14(4):115-116.
- Hayes, M.P., R. LaVal, M. Fogden, and P. Fogden. 1983. The mammals of Monteverde: An annotated checklist to the mammals of Monteverde - Monteverde, Costa Rica. Published by the Pensión Quetzal, Monteverde, Costa Rica.
- Hayes, M.P. 1983. Predation on the adults and prehatching stages of glass frogs. *Biotropica* 15(1):74-76.
- Hayes, M.P., and F.S. Cliff. 1982. A checklist of the herpetofauna of Butte County, the Butte Sink, and Sutter Buttes, California. *Herpetological Review* 13(3):85-87.
- Hayes, M.P., and C. Guyer. 1981. The herpetofauna of Ballona. Pp. H1-H80. In: Schreiber, R.W. (editor), *The biota of the Ballona region*. Publication of the Los Angeles County Planning Commission with assistance from the United States Office of Coastal Zone Management and the National Oceanic and Atmospheric Administration.
- Timmerman, W.W., and M.P. Hayes. 1981. The reptiles and amphibians of Monteverde. Published by the Pensión Quetzal, Monteverde, Costa Rica in cooperation with the Tropical Sciences Center, San Jose, Costa Rica.
- Hayes, M.P., and H. Starrett. 1980. Notes on a collection of centrolepid frogs from the Colombian Chocó. *Bulletin of the Southern California Academy of Sciences*.
- Hayes, M.P., R.A. Schlising, and H. Wurlitzer. 1979. *Calycadenia fremontii* - rediscovered? *Fremontia* 7(1):14-15..

Additionally, over 40 over non-referreed reports and publications have been produced.

Reviewed manuscripts or books for:

- Biological Conservation
- Biotropica
- Copeia
- Forest Science
- Herpetologica
- Herpetological Review
- Journal of Herpetology
- The Northwestern Naturalist
- The Southwestern Naturalist
- McGraw Hill: Interactive text in aquatic ecology
- Society of NW Vertebrate Biology: Book on sampling amphibians in lentic habitats
- Smithsonian Press: Book on environmental enrichment

Professional Societies:

- 1996- Life Member of the American Society of Ichthyologists and Herpetologists
- 1996- Member of The Wildlife Society
- 1995- Member of the National Association of Environmental Professionals
- 1995- Member of the Society of Northwestern Vertebrate Biology
- 1991- Member of the International Association for Bear Research and Management

- 1989- Member of the Society for Conservation Biology
- 1988- Life Member of the American Society of Zoologists
- 1987- Member of the American Association for the Advancement of Science
- 1987- Member of the Societas Europea Herpetologica
- 1986- Life Member of the Society for the Study of Amphibians and Reptiles

Professional Societies: (continued)

- 1980- Life Member of the Desert Tortoise Council
- Also a member of 10 minor, regional, or local professional societies.

Grants, awards, and contracts:

\$568,000	2000-2	Department of Natural Resources; funding for Forest and Fish Adaptive Management in headwater streams
\$12,800	2000	US Fish and Wildlife Service; funding for deformity study of the Oregon spotted frog at Conboy Lake
\$2,025	2000	Oregon Zoo Foundation; funding for PIT tags and skeletochronology on Umpqua northern red-legged frog study
\$950	2000	The Wildlife Society; funding for skeletochronology on Conboy Lake Oregon spotted frog study
\$124,000	1999-2000	Port of Portland; Rivergate western painted turtle study
\$8,500	1999-2000	US Fish and Wildlife Service; Oregon spotted frog habitat partitioning study
\$12,000	2000	US Fish and Wildlife Service, SAR funding; bullfrog selectivity study (R. Bruce Bury, principal investigator)
\$9,600	1999	US Fish and Wildlife Service; Northern red-legged frog overwintering
\$1,200	1999	Umpqua National Forest; funding for temperature data loggers for northern red-legged frog habitat utilization study
\$8,700	1999	US Fish and Wildlife Service; Oregon spotted frog oviposition
\$4,200	1998-2000	PNW Range and Experiment Station; Columbia spotted frog movements
\$35,860	1996-1997	US Fish and Wildlife Service, Oregon Department of Fish and Wildlife; Study of the status of the foothill yellow-legged frog in Oregon
\$32,300	1994-1997	Winema National Forest; Aquatic amphibian and reptile studies in the Sky Lake Wilderness
\$24,600	1996	Umpqua National Forest; Studies of the amphibian and reptile fauna of the Squaw Flat Research Natural Area

Additionally, I have obtained over 10 additional grants, awards, or contracts totalling over \$150,000 during the period 1988-1996.

Languages spoken:

French fluent
Spanish near fluent

Marc Hayes Publications since 2000

- McIntyre, A.P., Jay E. Jones, F.T. Waterstrat, J.N. Giovanini, S.D. Duke, M.P. Hayes, and A.J. Kroll. Evaluating N-mixture abundance estimators for unmarked individuals of cryptic taxa. *Methods in Ecology and Evolution* (in review)
- Hayes, M.P., and T. Quinn (editors). Review and synthesis of literature on Tailed Frogs (genus *Ascaphus*) with special reference to managed landscapes. Prepared for the Cooperative Management, Evaluation, and Research Committee, The Landscape and Wildlife Advisory Group and The Amphibian Research Consortium. 157 pp. + appendix (in review)
- Yahnke, A.E., C.E. Grue, M.P. Hayes, A.T. Troiano. Effects of the herbicide imazapyr on juvenile Oregon spotted frogs. *Environmental Toxicology and Chemistry* (in review)
- Tidwell, K.S., D.J. Shepherdson, and M.P. Hayes. Inter-population variability in evasive behavior in the Oregon Spotted Frog (*Rana pretiosa*). *Journal of Herpetology* (in press)
- Padgett-Flohr, G., and M.P. Hayes. 2011. Assessment of the vulnerability of the Oregon spotted frog (*Rana pretiosa*) to the Amphibian chytrid fungus (*Batrachochytrium dendrobatidis*). *Herpetological Conservation and Biology* 6(2):99-106.
- Thompson, C.E., J.M. Walker, F.T. Waterstrat, A.P. McIntyre, and M.P. Hayes. 2011. *Rhyacotriton kezeri* (Columbia Torrent Salamander) Predation. *Herpetological Review* 42(3):406-408.
- Conlon, J.M., M. Mechkaraska, E. Ahmeda, L. Coquet, T. Jouenne, J. Leprince, H. Vaudry, M.P. Hayes, and G. Padgett-Flohr. 2011. Host defense peptides in skin secretions of the Oregon spotted frog *Rana pretiosa*: Implications for species resistance to chytridiomycosis. *Developmental and Comparative Immunology* 35:644-649.
- Palmeri-Miles, A.F., K.A. Douville, J.A. Tyson, K.D. Ramsdell and M.P. Hayes. 2010. Field observations of oviposition and early development of the Coastal Tailed Frog (*Ascaphus truei*). *Northwestern Naturalist* 91(2):206-213.
- Hayes, M.P., C.J. Rombough, G.E. Padgett-Flohr, L.A. Hallock, J.E. Johnson, R.S. Wagner, and J.D. Engler. 2009. Amphibian chytridiomycosis in the Oregon spotted frog (*Rana pretiosa*) in Washington State, USA. *Northwestern Naturalist* 90(2):148-150.
- McIntyre, A.P., M.P. Hayes and T. Quinn. 2009. *Type N Feasibility Study*. A report submitted to the Landscape and Wildlife Advisory Group, Amphibian Research Consortium, and the Cooperative Monitoring, Evaluation, and Research Committee. Washington Department of Fish and Wildlife, Olympia, Washington. 48 pp. + appendices
- Ricketts, N.L., and M.P. Hayes. 2009. *2009 Pilot Citizen Science Stillwater Amphibian Protocol Summary Report*. Washington Department of Fish and Wildlife, Olympia, Washington. 33 pp + appendices
- Curry, T.R. and M.P. Hayes. 2009. *Rana aurora* (Northern Red-legged Frog). Egg mass disturbance. *Herpetological Review* 40(2):208-209.
- Kroll, A.J., M.P. Hayes, and J.G. MacCracken. 2009. Concerns regarding the use of amphibians as metrics of critical biological thresholds: a comment on Welsh and Hodgson (2008). *Freshwater Biology* 54(11):2364-2373.
- Tyson, J.A., K.A. Douville and M.P. Hayes. 2009. *Rhyacotriton olympicus* (Olympic Torrent Salamander). Maximum larval size. *Herpetological Review* 40(1):67.

- Lund, E.M., M.P. Hayes, T.R. Curry, J.S. Marsten, and K.R. Young. 2008. Predation on the Coastal Tailed Frog (*Ascaphus truei*) by a shrew (*Sorex* spp.) in Washington State. *Northwestern Naturalist* 98(2):200-202.
- Hayes, M.P.; T. Quinn; K.O. Richter; J.P. Schuett-Hames; and J.T. Serra Shean. 2008. Maintaining Lentic-Breeding Amphibians in Urbanizing Landscapes: The Case Study of the Northern Red-Legged Frog (*Rana aurora*). Pp. 445-461. In: Mitchell, J.C., R.E. Jung Brown, and B. Bartholomew (editors), *Urban Herpetology*, Society for the Study of Amphibians and Reptiles, Herpetological Conservation 3. [Book chapter]
- Hayes, M.P., T. Quinn, and T.L. Hicks. 2008. *Implications of Capitol Lake Management for Fish and Wildlife*. Report to the Washington State Department of General Administration, Olympia, Washington. 88 pp. + appendices
- Hayes, C.B., and M.P. Hayes. 2008. *Elgaria coerulea* (Northern Alligator Lizard). Juvenile growth. *Herpetological Review* 39(2):222-223.
- Hicks, T.L., D.E. Mangan, A.P. McIntyre and M.P. Hayes. 2008. *Rhyacotriton kezeri* larval diet. *Herpetological Review* 39(4): 456-457.
- Rombough, C.J. and M.P. Hayes. 2008. *Rana pretiosa* (Oregon Spotted Frog). Reproduction. *Herpetological Review* 39(3):340-341.
- Waterstrat, F.T., A.P. McIntyre, M.P. Hayes, K.M. Phillips, and T.R. Curry. 2008. *Ascaphus truei* (Coastal Tailed Frog). Atypical Amplexus. *Herpetological Review* 39(4):458.
- Quinn, T.; Hayes, M.P.; D.J. Dugger; T.L. Hicks; and A. Hoffmann. 2007. Comparison of two techniques for surveying headwater stream amphibians. *Journal of Wildlife Management* 71(1):282-288.
- Richart, C.H., M.P. Hayes and R.P. O'Donnell. 2007. Comparative diet of three species of terrestrial forest-dwelling amphibians (*Rana aurora*, *Dicamptodon tenebrosus*, and *Rhyacotriton kezeri*) in western Washington. *Northwestern Naturalist* 88(2):121-122. [abstract]
- Barreca, A.B., F.T. Waterstrat, and M.P. Hayes. 2007. Differentiating *Ascaphus truei* at sexual maturity. *Northwestern Naturalist* 88(2):102-103. [abstract]
- O'Donnell, R.P., T. Quinn, M.P. Hayes and K.E. Ryding. 2007. Comparison of three methods for surveying amphibians in forested seep habitats in Washington State. *Northwest Science* 81(4):274-283.
- Hayes, M.P. 2007. Size record? *Herpetological Review* 38(4):393.
- Rombough, C.J. and M.P. Hayes. 2007. *Rana boylei* (Foothill Yellow-legged Frog). Reproduction. *Herpetological Review* 38(1):70-71.
- Waterstrat, F.T., R.L. Crawford, and M.P. Hayes. 2007. *Ascaphus truei* (Tailed Frog). Spider Prey. *Herpetological Review* 38(3):318.
- Hayes, M.P., C.J. Rombough and C.B. Hayes. 2007. *Rana aurora* (Northern Red-legged Frog). Movement. *Herpetological Review* 38(2):192-193.
- Hayes, M.P.; T. Quinn; D.J. Dugger; T.L. Hicks; M.A. Melchior; and D.E. Runde. 2006. Dispersion of coastal tailed frog (*Ascaphus truei*): An hypothesis relating occurrence of frogs in non-fish-bearing headwater basins to their seasonal movements. *Journal of Herpetology* 40(1):51-57.

- Hayes, M.P., T. Quinn, D.J. Dugger, and T.L. Hicks. 2006. Dispersion of Coastal Tailed Frog (*Ascaphus truei*): A hypothesis relating occurrence of frogs in non-fishbearing headwater basins to their seasonal movements. *Northwestern Naturalist* 87(2):171-172. [abstract]
- Hayes, M. P., M. R. Jennings, and G. B. Rathbun. 2006. *Rana draytonii* (California Red-legged Frog). Prey. *Herpetological Review* 37(4):449.
- Karraker, N.E., D.S. Pilliod, E.L. Bull, P.S. Corn, L.V. Diller, L.A., Dupuis, M.P. Hayes, B.R. Hossack, G.R. Hodgson, E.J. Hyde, K. Lohman, B.R. Norman, L.M. Ollivier, C.A. Pearl, C.R. Peterson. 2006. Taxonomic variation in the oviposition by Tailed Frogs (*Ascaphus* spp.). *Northwestern Naturalist* 87(2):87-97.
- Hayes, M.P., J.D. Engler, and C.J. Rombough. 2006. Trends in the breeding population of the Oregon spotted frog (*Rana pretiosa*) at Conboy Lake National Wildlife Refuge. *Northwestern Naturalist* 87(2):171. [Abstract]
- Hayes, M.P., J.D. Engler and C.J. Rombough. 2006. *Rana pretiosa* (Oregon Spotted Frog). Predation. *Herpetological Review* 37(2):209-210.
- Price, R.F., D.J. Dugger, T.L. Hicks and M.P. Hayes. 2006. *Dicamptodon copei* (Cope's Giant Salamander). Predation. *Herpetological Review* 37(4):436-437.
- Rombough, C.J., M.P. Hayes and J.D. Engler. 2006. *Rana pretiosa* (Oregon Spotted Frog). Maximum size. *Herpetological Review* 37(2):210.
- Richart, C.H., M.P. Hayes and W.P. Leonard. 2006. Washington terrestrial slugs and snails. *Northwestern Naturalist* 87(2):184. [abstract]
- Hayes, M.P., and L.L.C. Jones. 2005. *Rhyacotriton olympicus*. Pp. 880-882. In: Lannoo, M.J. (editor), *Amphibian Declines: The Conservation Status of United States Species*. University of California Press, Berkeley. [Book section]
- Hayes, M.P. and T. Quinn. 2005. *Rhyacotriton kezeri*. Pp. 876-880. In: Lannoo, M.J. (editor), *Amphibian Declines: The Conservation Status of United States Species*. University of California Press, Berkeley. [Book section]
- Hayes, M.P. 2005. *Rhyacotriton cascadae*. Pp. 874-876. In: Lannoo, M.J. (editor), *Amphibian Declines: The Conservation Status of United States Species*. University of California Press, Berkeley. [Book section]
- Pearl, C.A., and M.P. Hayes. 2005. *Rana pretiosa*. Pp. 577-580. In: Lannoo, M.J. (editor), *Amphibian Declines: The Conservation Status of United States Species*. University of California Press, Berkeley. [Book section]
- Jennings, M.R. and M.P. Hayes. 2005. *Rana boylei* (Foothill Yellow-legged Frog). Coloration. *Herpetological Review* 36(4):438.
- Rombough, C.J., M.P. Hayes, N.L. Duncan. 2005. Foothill Yellow-legged Frog abundance in Cow Creek. *Northwestern Naturalist* 86(2):114-115. [abstract]
- Dugger, D.J., M.P. Hayes, T. Quinn. 2005. Columbia Torrent Salamander (*Rhyacotriton kezeri*) occurrence in headwater streams: the importance of water. *Northwestern Naturalist* 86(2):92. [abstract]
- Hayes, M.P., A.P. McIntyre, T. Quinn, D.J. Dugger, and T.L. Hicks. 2005. *Plethodon* salamander occupancy in managed landscapes in southwest Washington. *Northwestern Naturalist* 86(2):98. [abstract]

Addendum X - Hayes Publications since 2000

- Rombough, C. J., and M. P. Hayes. 2005. Novel aspects of oviposition site preparation by female foothill yellow-legged frogs (*Rana boylei*). *Northwestern Naturalist* 86:157-160.
- Rombough, C.J., J. Chastain, A.M. Schwab and M.P. Hayes. 2005. *Rana boylei* (Foothill Yellow-legged Frog). Predation. *Herpetological Review* 36(4):438-439.
- Hayes, M.P., and C.B. Hayes. 2004. *Rana aurora aurora* (Northern red-legged frog): Vocalizations. *Herpetological Review* 35(1):52-53.
- Hayes, M.P., and C.B. Hayes. 2004. *Bufo boreas boreas* (Boreal toad): Behavior. *Herpetological Review* 35(4):369-370.
- Hayes, M.P., and C.B. Hayes. 2003. *Rana aurora aurora* (Northern red-legged frog): Juvenile Growth and Male Size at Maturity. *Herpetological Review* 34(3):112-133.
- Hayes, M. P. and C.B. Hayes. 2003. *Ensatina eschscholtzii oregonensis* (Oregon Ensatina). Colonization. *Herpetological Review* 34(1):45-46.
- Eaton, Mordas, A., E.P. Urling, M.P. Hayes, D.J. Dugger, and T. Quinn. 2003. *Plethodon dummi*, *Plethodon vehiculum* (Dunn's Salamander, Western Red-backed Salamander). Behavior. *Herpetological Review* 34(1):54-55.
- Pearl, C.A. and M.P. Hayes. 2002. Predation by Oregon Spotted Frog (*Rana pretiosa*) on Western Toads (*Bufo boreas*) in Oregon. *American Midland Naturalist* 147(1):145-152.
- Bull, Evelyn; and M.P. Hayes. 2002. Overwintering of Columbia spotted frogs (*Rana luteiventris*) in northeastern Oregon. *Northwest Science* 76(2):141-147.
- Hayes, M.P., C.A. Pearl, and C.J. Rombough. 2001. *Rana aurora aurora*: Movement. *Herpetological Review* 32(1):35-36.
- Bull, Evelyn; and M.P. Hayes. 2001. Post-breeding movements of Columbia spotted frogs (*Rana luteiventris*) in northeastern Oregon. *Western North American Naturalist* 61(1):119-123.
- Altman, R.; M.P. Hayes; R.D. Forbes; and S.D. Janes. 2001. Chapter 10: Wildlife communities of westside grassland and chaparral. In: D.H. Johnson and T. O'Neill (editors), *Habitat-Species Relationships of Oregon and Washington*, Oregon State University Press. [Book chapter]
- Hayes, M.P., J.D. Engler, S. Van Leuven, D.C. Friesz, T. Quinn, and D.J. Pierce. 2001. Overwintering of the Oregon Spotted Frog (*Rana pretiosa*) at Conboy Lake National Wildlife Refuge, Klickitat County, Washington, 2000-2001. Final Report to the Washington Department of Transportation, Washington Department of Fish and Wildlife, Olympia, Washington. 38 pp.
- Hayes, M.P.; M.R. Jennings; and J.D. Mellen. 2000. Beyond mammals: Environmental enrichment for amphibians and reptiles. Pp. 205-235. In: Hutchinson, M.; J. Mellen; and D. Shepherdson (editors), *Second Nature: Environmental enrichment for captive animals*. Smithsonian Institution Press, Washington, D.C. [Book chapter]
- Bull, E.L., and M.P. Hayes. 2000. Livestock effects on reproduction of the Columbia spotted frog. *Journal of Range Management* 53(3):291-294.

EXHIBIT B

**MARC HAYES EXPERT REPORT
ATTACHMENT C**

MATERIALS RELIED ON IN FORMING EXPERT REPORT OPINIONS¹

- Exhibits to Sept. 23, 2011 declaration of Dr. Marc Hayes (Plaintiffs' Preliminary Injunction ("Pl. PI Ex.") 6) (DE 60-3)
- Exhibits to Nov. 4, 2011 declaration of Dr. Marc Hayes (Pl. PI Ex. 45 (DE 79-1)
- U.S. Fish and Wildlife Service. 2002. Recovery plan for the California red-legged frog (CRLF). Region 1, Portland, Oregon, USA.
- San Francisco Garter Snake (SFGS) Recovery Plan
- 2008 Swaim report for SFGS/CRLF at Sharp Park and Mori Point (Pl. PI Ex. 22) (DE 56)
- 2005 Swaim report for SFGS/CRLF at Sharp Park and Mori Point
- Swaim, K. SFGS Improvement Project At Mori Point, Pacifica, Cal. (CCSF89390-443)
- Sharp Park Conceptual Alternatives Report and Appendices ("Alt. Report") (Feb. 2006)
- Peter Baye Technical Review and Comments on Alt. Report
- Final Draft Endangered Species Compliance Plan for SFGS (CCSF 4590-4608)
- Declaration of Dr. Mark Jennings dated October 18, 2011 (DE 68)
- Declaration of Ms. Karen Swaim dated October 21, 2011 (DE 66-1)
- Declaration of Lisa Wayne dated October 21, 2011 (DE 72)
- Darren Fong personal communication
- Fong, D. et al. Year 2003-2005 California Red-legged Frog Surveys, Golden Gate National Recreation Area
- Fong, D. et al., Year 2006-09 CRLF Surveys, Golden Gate Nat'l Recreation Area \ and data sets through 2011
- Kuhn personal communications
- DeGregorio, B. A., T. E. Hancock, D. J. Kurz, and S. Yue. 2011. How Quickly are Road-Killed Snakes Scavenged? Implications for Underestimates of Road Mortality. Journal of the North Carolina Academy of Science 172: 184-188 (DE 60-3)
- DeGregorio, B.A., et al, 2010. Patterns of Snake Road Mortality On An Isolated Barrier Island. Herpetological Conservation and Biology 5(3):441-448 (DE 79-1)
- Brett DiGregorio personal communications
- CRLF Egg Mass Survey Sheets
- Deposition testimony of Jon Campo (Sept. 13, 2011)
- Deposition testimony of John Ascariz (Dec. 14, 2011)
- Deposition testimony of Wayne Kappelman (Dec. 15, 2011)
- Deposition testimony of Lisa Wayne (Jan. 9, 2012)
- U.S. Fish and Wildlife Service. 2006. San Francisco Garter Snake (*Thamnophis sirtalis tetrataenia*). 5-Year Review: Summary and Evaluation, Sacramento Field Office, Sacramento, CA.
- Sept. 27, 2011 email from Christina Crooker to Brent Plater and Darren Fong re SFGS sightings at Mori Point
- Kats, L.B., and R.P. Ferrer. 2003. Alien predators and amphibian declines: review of two decades of science and the transition to conservation. Diversity and Distributions 9(2):99-110
- Gamradt, S.C, and L.B. Kats. 2002. Effect of introduced crayfish and Mosquitofish on California Newts. Conservation Biology 10(4):1155-1162; and references therein.
- Emails between City and FWS (Pl. PI Ex. 5) (DE 54)
- photographs of an egg mass documented in Horse Stable Pond (Pl. PI Ex. 3
 - and 4 (DE 54 and 60)
- photographs of the CRLF taken June 26, 2011 (Pl. PI Ex. 5) (see DE 60)
- photographs of flooding events at Sharp Park (Pl. PI Ex. 5)(see DE 60)
- photograph of freshwater crayfish observed inside Sharp Park's outfall pipe
 - (Pl. PI Ex. 5)(see DE 60)
- Dec. 8, 2011 letter from FWS to CCSF (CCSF 96925-26)
- Phillip Williams & Ass. 1992 Laguna Salada Resource Enhancement Plan
- Jan. 2012 Linear Regression Analysis by Marc Hayes
- Jennings and Hayes, 1994. Amphibian and Reptile Species of Special Concern in California.
- Unpublished Data on entrainment.

¹ This list encompasses materials the expert relied on in forming expert opinions, and is intended to include all materials listed in the expert report, but to the extent additional references are listed in the report the expert relied on those are not included.

EXHIBIT I

PGA design

LANDSCAPE ARCHITECTS

October 27, 2011

Bill Wycko
Environmental Review Officer
Planning Department
City of San Francisco
1650 Mission Street, Ste 400
San Francisco, CA 94103-2479

RE: Sharp Park Golf Course – Historic Resource Evaluation

Dear Mr. Wycko,

I have reviewed Appendix C of the DEIR for the *Significant Natural Resources Management Plan: Sharp Park Golf Course* and question the determination of eligibility for listing on the National Register of Historic Properties (NRHP). On page 3-4 the author suggests that Sharp Park Golf Course has historic significance under Criterion A and C under the NRHP and Criterion 1 and 3 for the California Register of Historic Resources (CRHR). Criterion C/3 requires that "a property embody the distinctive characteristics of a type, period, or method of construction that represents the work of a master, or that possesses high artistic values". Based on the number and extent of alterations that have taken place since the period of significance (1929 – 1932) I question the validity of finding Sharp Park eligible as a historic resource.

*Bulletin 18 "How to Evaluate and Nominate Designed Historic Landscapes,"*¹ states "As defined by the National Historic Preservation Act of 1966 and the National Register criteria, to be eligible for the National Register a designed historic landscape must possess significance and integrity of location, design, setting, materials, workmanship feeling and association." Sharp Park Golf Course lacks integrity.

The *Historical Resources Evaluation Report (HRER)* prepared by Tetra Tech, Inc. describes many alterations made to the course since 1932. Comparing the course layouts depicted in the two exhibits included in the Evaluation Report² one finds very few similarities between how the course was designed and how it exists today.

¹ National Park Service, "How to Evaluate and Nominate Designed Historic Landscapes," *National Register Bulletin No. 18*, p. 6.

² The original Sharp Park Golf Links plan prepared by Mackenzie, Hunter & Egen (Figure 3) and the aerial of the Existing Golf Course (Figure 2).

Chris Cathy Christopher
Pattillo Garrett Kent

444 - 17th Street Oakland CA 94612
Tel 510.465.1284 Fax 510.465.1256

1. The original hole 1 (now hole 11) was a long, straight shot. The reconfigured hole doglegs to the right.
2. The original hole 2 (now hole 12) was a dogleg that wrapped around the south end of the course. Hole 12 is now a lot shorter with no dogleg.
3. The original holes 3, 4, and 8 were destroyed in a big storm and not replaced.
4. The original hole 5 offered multiple fairway options – a unique design feature of Mackenzie. Hole 17 which replaced 5 is a single straight shot.
5. The original hole 6 that ran east-west at the north boundary no longer exists.
6. The original hole 7 appears to be similar to current hole 16 identified on Figure 2 as having been built after 1941, after the period of significance.
7. The original holes 9 and 10 each offered double fairways. The replacement holes 13 and 14 eliminated these special features.
8. The original hole 11 – a short run - appears to be similar to current hole 15.
9. The original hole 12 was a long straight shot. It has been replaced by hole 18 that is longer with a dogleg.
10. The original holes 13, 14 and 15 were on the east side of the county road and generally paralleled the road running north-south. Today this area has four holes that all run east-west.
11. The original hole 16 was a dogleg left replaced by hole 3 a straight shot.
12. The original hole 17 ran east-west and was a long shot with a dogleg. Hole 8, a short, straight fairway replaced it.
13. The original hole 18 was a dogleg. This hole has been replaced by hole 2, a straight shot.

In summary only hole 11 (now hole 15) is similar to the original design. The layout of the remainder of the course has been substantially altered. The change to the order of how the holes are played is significant as it materially alters the sequence and nature of views the player experiences making it unlike what was intended by the designer. Other major changes implemented since the period of significance include:

- A. Elimination or reconfiguration of several sand traps.
- B. Construction of a seawall in 1941 to prevent flooding of the golf course. This eliminated views to the beach and Pacific Ocean and the essence of the links design concept.
- C. Filling a portion of the lagoon as part of the reconfiguration of hole 10.
- D. Installation of concrete golf cart paths along the back nine holes in 1996 where none existed previously.
- E. Culverting of water features on five holes and the elimination of water hazards – an important component of the original design.
- F. Installation of a 4000-gallon pump to help with annual flooding of Laguna Salada.
- G. Alterations made between 1985 and 1994 to accommodate female players such as the widening of the fairways.

Adding together all of these alterations it is apparent that Sharp Park Golf Course lacks sufficient integrity to qualify as a historic resource under criterion C/3. The course no longer reflects the work of Alister Mackenzie. The land use remains a golf course but otherwise there are few similarities between the course that existed during the period of significance and what remains today.

The Evaluation Report notes that Alister Mackenzie attained status as a master golf course architect. Appendix C on page 4-7 notes, "George Shackelford, in his book *Grounds for Golf*, describes Mackenzie as a master designer and offers that Mackenzie's secret to creating unique courses was his talent for routing." Regrettably, today nothing remains of Mackenzie's unique routing. He continues to explain that his work "was known for its original and distinctive bunkers, with irregular shapes and each with its own design." And "Distinctive bunkering, the use of small hillocks around greens, and exciting hole locations were Mackenzie's trademark".

Another of Mackenzie's trademarks was his talent for working with natural landform and subtly integrating his courses with a site's topography to take full advantage of the unique qualities of each site. Quoting from the HRER, "Mackenzie felt that the success of golf course construction depended entirely on making the best use of natural features and devising artificial ones indistinguishable from nature." The HRER continues with, "..... while many architects try to create a special course, Mackenzie could figure out how best to fit holes into a property and situate a golf course to evoke a comfortable, settled, connection to the ground. His course routings are always functional and original but rarely do they fight the contours of the property."

In summary, defining characteristics of Mackenzie's design style included unique course routing, a talent for adapting a course to fit the land, an ability to offer challenge to players of varying skill levels, distinctively designed bunkers, and inclusion of multiple fairway options – offering advantage to those to took greater risks in their play. The vast majority of these features have been eliminated from the course. According to Wexler, in a recently published article "no appreciable trace of his strategy remains in play."³

Unfortunately, Sharp Park Golf Course began to fail even before the course opened in 1932 because Mackenzie failed to fully understand the forces of nature at this site. Page 4-3 of the Evaluation Report notes that the opening was delayed twice due to "drainage problems on the course due to winter rains." Shortly after the course opened a major storm washed out a large portion of the course and necessitated construction of the seawall in 1938 intended to prevent similar damage in the future. This type of damage has continued – as recently as 1982 a major storm wiped out several holes. In 1990 another breach killed many of the cypress trees on the course. Few of the golf courses designed by Alister Mackenzie remain intact today. It would be ironic and misplaced if this course – one that represents a failure in design – became a lasting representative of his life's work by being officially designated as a historic property.

³ Dr. Alister Mackenzie, "Sharp Park Golf Course", Pacifica, CA page 113

The determination of historic significance is tied to a site's level of integrity. According to *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques*⁴ "The historic integrity of a cultural landscape relates to the ability of the landscape to convey its significance." And "Historic integrity is assessed to determine if the landscape characteristics and associated features, and the spatial qualities that shaped the landscape during the historic period of significance, are present in much the same way as they were historically." Emphasis added.

The guide continues, "Historic integrity is determined by the extent to which the general character of the historic period is evident, and the degree to which incompatible elements obscuring the character can be reversed". In the case of Sharp Park Golf Course the changes to the course were not the result of the normal evolution of a living landscape – maturing trees and other plantings, but rather major changes that were forced to solve functional problems that resulted from flaws in the original design – a failure to fully understand the power of nature and its ability to wreak havoc. The changes made to Sharp Park Golf Course cannot be reversed because doing so would recreate the conditions that necessitated that the alterations be made in the first place.

Page 5-2 of the HRER notes, "Because landscape features change over time, a landscape need not retain all of the original features it had during its period of significance, but it must retain the essential features and characteristics that make its historic character clearly recognizable."

In essence for a site to meet the criteria of historic significance most of the designed features must look as they did during the period of significance. This may be true for the Clubhouse and maintenance building which are not addressed here, but it is not the case at Sharp Park Golf Course and no doubt explains why "None of the state or national registers identified Sharp Park Golf Course as a historical resource" as noted on page 4-1 of the HRER.

By making the finding that the existing golf course represents a historic resource under criterion C/3 it seems that Tetra Tech failed to appreciate not only the subtleties of golf course architecture but its essential features. Just because there was a golf course present in 1932 the fact that there is still a golf course present today, does not qualify the current course as a historic resource.

Sharp Park Golf Course lacks integrity. While a golf course at this site is consistent with the historic land use, that fact is insufficient evidence for a finding of historic significance. Failure to demonstrate significance voids eligibility for historic resource status. I urge you to consider this as you plan for the future use of Sharp Park.

Sincerely,



Chris Pattillo, ASLA
Historic Landscape Architect
President, PGAdesign™

⁴ A Guide To Cultural Landscape Reports: Contents, Process and Techniques by Robert R. Page, Cathy A. Gilbert, and Susan A. Dolan, US Department of the Interior, National Park Service, Cultural Resource Stewardship and Partnerships, 1998.

CHRIS PATTILLO

HISTORIC LANDSCAPE ARCHITECT

PROFESSIONAL EXPERIENCE

PGAdesign^{INC}, 1979 to present

EDUCATION - REGISTRATION

Master of Landscape Architecture, 1975, UC Berkeley
Bachelor of Arts, 1972, UC Berkeley
California Landscape Architect, #1925

ASSOCIATIONS

Historic American Landscapes Survey (HALS), No. California Chapter, Co-Founder 2004, Chair 2004-2009 & Vice Chair 2010
American Society of Landscape Architects (ASLA), Member
ASLA Historic Preservation Professional Practice Committee, National Chair & Vice Chair 2006-2009
California Genealogy Society, Vice President & Board member 2010
Garden Conservancy, Member
California Preservation Foundation, Member
National Trust, Member
Oakland Heritage Alliance, Member
Oakland Chamber of Commerce, Member
Oakland Chamber of Commerce Economic Develop Committee
Open Space, Conservation & Recreation Elements (OSCAR), Advisory Committee

AWARDS

Oakland Chamber of Commerce: "Small Business of the Year" 1995
Oakland Chamber of Commerce: "Woman Owned Business of the Year" 2000

RELEVANT PROJECT EXPERIENCE

Badger Pass Ski Area CLR, Yosemite Natl. Park, CA
Doyle Drive in San Francisco Presidio HALS, San Francisco, CA
Atchison Village HSR, Richmond, CA
Meyers Estate Garden Master Plan & Maintenance Guidelines, Union City, CA
Roeding Park HALS, Fresno, CA
Sakai-Oishi Nurseries HALS, Richmond CA
William Land Park Cultural Landscapes Survey & Evaluation, Sacramento
Berkeley City Club Gardens HALS, Berkeley, CA

PUBLICATIONS

"Preparing a Historic American Landscapes Survey (HALS) History: Brief Guide to Identifying and Documenting HALS Sites," co-author, National Park Service, US Dept of the Interior, Washington D.C. (August 2010)

"Doyle Drive: Using Innovation HALS Methodology," SF Heritage News, Vol. XXXVII, No. 2, Summer 2010

"Innovation HALS Methodology Developed for SF Presidio Project," CPF News, Summer 2009

PRESENTATIONS

Documenting our Heritage, Annual ASLA conference, San Diego, California, October 2011
Historic American Landscapes Survey – An Introduction, for ASLA Chapter Presidents, October 2011
Exploring Cultural Landscapes through Case Studies, California Preservation Foundation (CPF), August 2010
Historic American Landscapes Survey – An Overview, American Society of Landscape Architects (ASLA), July 2010
Doyle Drive HALS at the Presidio of San Francisco, CPF, May 2010
Landscape Within The Historic Context, American Institute of Architects (AIA) Historic Resources Committee, San Francisco, CA, June 2009
Historic American Landscapes Survey – Tools of Preservation, UC Berkeley Extension, Landscape Architecture Program, May 2009
Alviso Adobe Park: History & Design Process – Opening Remarks, Pleasanton, CA, October 2008
Historic American Landscape Survey – A Panel Discussion, ASLA Annual Conference, San Francisco, CA, October 2007
Olmsted in the East Bay – tour leader & speaker, ASLA Annual Conference, San Francisco, CA, October 2007
Oakland Waterfront Parks – tour speaker, ASLA Annual Conference, San Francisco, CA, October 2007
Historic American Landscapes Survey – An Overview, Oakland Heritage Alliance (OHA), Oakland, CA, Summer 2007
Historic American Landscapes Survey – An Overview, Town & Gown Club, Berkeley, CA Spring 2007
Cleveland Cascade – Rehabilitation of a Howard Gilkey Landscape, OHA, Oakland, CA, March 2007
Making a Splash: Preservation of Pools and Fountains, CPF Conference, Sacramento, CA, April 2006
Peralta Hacienda Historical Park – Planning and Design, Friends of Peralta Hacienda, Oakland, CA, December 2005
Kaiser Roof Garden and the Gardens of the Museum of California: Comparing Two Mid-Century Modern Roof Gardens, OHA, Oakland, CA, July 2005
Planning and Public Policy: The Urban Planning Process, Department of City & Regional Planning, UC Berkeley, April 1983

HISTORIC AMERICAN LANDSCAPES SURVEY (HALS) NOMINATION FORMS

Anderson Marsh State Historic Park, Lake County, 2011
Berkeley Women's City Club, Berkeley, 2011
Bidwell Mansion, Chico, 2011
Bidwell Park, Chico, 2011
Boyd Memorial Park, San Rafael, 2010
California Nursery Company Historic Park, Niles, 2008
Call Ranch at Fort Ross State Park, Jenner, 2009
Captain Fletcher's Inn & Manager's House, Navarro, 2009
Centerville Pioneer Cemetery, Fremont, 2008
Children's Fairyland, Oakland, 2009
China Camp State Park, San Rafael, 2009
Fern Dale (Shaw House), Ferndale, 2009
Forest Theater, Carmel, 2010
Henry H. Meyers Garden, Union City, 2010
La Mirada Adobe, Monterey, 2010
Marin Art and Garden Center, Ross, 2009
McConaghy Estate, Hayward, 2009
Meek Mansion & Carriage House, Hayward, 2009
Mendocino Woodlands Demonstration Recreation Area, Mendocino, 2009
Micka Grove Park, Lodi, 2009
Mountain View Cemetery, Oakland, 2010
Point Arena Cove, Point Arena, 2010
Point Arena Lighthouse, Point Arena, 2010
Point Cabrillo Lighthouse, Casper, 2009
Rancho Higuera Adobe Historical Park, 2008
Ravenswood Estate, Livermore, 2009
Robson-Harrington Park, San Anselmo, 2009
Shibata Japanese Garden (Mount Eden Nursery), Hayward, 2010
Shinn Historical House & Arboretum, Fremont, 2008
Sun House, Ukiah, 2009
Tor House, Carmel, 2010
Wassama Village, 2010

WILD Equity

INSTITUTE

*Building a healthy and sustainable global community for people
and the plants and animals that accompany us on Earth*

The Wild Equity Institute is working to build a new public park at Sharp Park in Pacifica, CA. With our partners at the NPCA, the Neighborhood Parks Council, the National Japanese American Historical Society, and many other organizations, we have proposed to close the course and partner with the National Park Service to restore the land and interpret its hidden history, including the former WWII internment camp and prehistoric artifacts that have been found on the site.

Perhaps in response to this idea and litigation, **for the first time San Francisco is proposing to landmark Sharp Park Golf Course. This proposal is not well informed.** Below you will find background information about this proposal.

Although Alister MacKenzie, the original architect of Sharp Park Golf Course, has made some important golf courses, there is significant disagreement about (a) the quality of the original architectural design at Sharp Park and whether it is a reflection of Mackenzie's signature design, and (b) its current integrity. **Every history written about this course before the restoration proposal we are advancing was announced concluded that the original MacKenzie design no longer exists at Sharp Park today.**

Some contemporary golf advocates have suggested that these previous assessments were based on misinformation or bad data. They have gone as far as suggesting that several of the links at Sharp Park remain consistent with Sharp Park's original design. As a preliminary matter, **golf courses are not simply a collection of links: they are a course, and to suggest that because a few golf links remain in the places Alister MacKenzie placed them does not answer the question about the historic integrity of the course as a whole.**

But more importantly, these assessments are directly contradicted by assessments made away from the heat of this dispute, and not conducted by individuals with a stake in the outcome. **Indeed, the only individuals who have asserted that Sharp Park is historic are associated with the San Francisco Public Golf Alliance—a golf activist organization that is not qualified to provide these assessments, and has an inherent conflict in doing so regardless.**

Therefore, the previous assessments are more likely to be unbiased and accurate: even if the historians who wrote them would prefer the original course be restored, instead of than the natural areas upon which the course was built.

Some of MacKenzie's courses should be considered for recognition. But Sharp Park is simply not the place to start. There is not a single Alister MacKenzie golf course presently listed on the California or federal registers of historic places, and most everyone would agree that Sharp Park is not one of the greatest examples of his work. **Indeed, the litany of problems the golf course faces—from chronic annual flooding, to the killing of endangered species, to the low grades given the course by its own golfers, to the chronic financial instability of the course, to the inevitable loss of the site to sea level rise as our climate changes—all indicate that this particular course does not exemplify the work of a master implementing his art.**

Moreover, the San Francisco Public Golf Alliance has distributed false information to the Planning Department and to the Historic Preservation Commission arguing that Sharp Park Golf Course itself has been designated an historic landmark by the City of Pacifica. **This is not true: indeed, to the extent any historic preservation has been provided to Sharp Park, it has been equally provided to the trees, lagoon, and marsh on the property,** as will be shown below. Indeed, a proposal to try and landmark the golf course was tabled indefinitely by Pacifica's Planning Commission in 2009.

The Pacifica General Plan (as updated August 2005) Historic Preservation Element. This section includes a "list and map of all of the sites and structures felt to be of historic significance in Pacifica."

With regards to Sharp Park, the Pacifica Historic Sites list includes:

- Number 18. Laguna Salada & Marsh
- Number 19. Sharp Park Golf Course & Clubhouse
- Number 20. Trees in Sharp Park

However, this section also states that "the element would be implemented by an Historic Ordinance which would establish a Pacifica Historic Sites Advisory Committee to review proposed changes to sites and structures designated on the Historic Sites Map and advise the Planning Commission and City Council of the appropriateness of the proposal." **No such Historic Ordinance or Advisory Committee was ever created: instead Pacifica implemented this through its zoning code.**

Title 9 of Pacifica's Zoning Code, Chapter 7 covers Historic Preservation. Section 9-7.208 of the Code lists Pacifica's designated Historic Sites:

Sec. 9-7.208. - Final designations.

The following structures, having been approved by the Planning Commission and Council for designation as historic landmarks pursuant to the procedures of this article, are hereby given final landmark designation:

- (a) Sanchez Adobe;
- (b) Sharp Park Golf Course Clubhouse;**
- (c) Little Brown Church;
- (d) San Pedro Schoolhouse;
- (e) 185 Carmel Avenue;
- (f) Vallemar Station, 2125 Cabrillo Highway;
- (g) Anderson's Store, 220 Paloma Avenue;
- (h) 165 Winona Avenue; and
- (i) Dollaradio Station.

(§ 1, Ord. 482-C.S., eff. May 27, 1987, as amended by § 1, Ord. 533-C.S., eff. September 27, 1989, § 1, Ord. 534-C.S., eff. September 27, 1989, and § 2, Ord. 569-C.S., eff. July 10, 1991, § II, Ord. No. 770-C.S., eff. May 26, 2010)

As you can see, only the golf course clubhouse has been designated historic by Pacifica. **Laguna Salada itself, along with the golf course, are 'potential' historic resources according to the general plan, but because these potential resources were never finalized into actual landmarks, they are not so protected.**

Only Sharp Park Golf Course's clubhouse is listed as an historic landmark in Pacifica, an uncontroverted finding that is not impacted in any way by the restoration proposals we have all pursued. **However, to rely on Pacifica's general plan as reason to landmark the golf course takes one only so far, because the marsh, lagoon and trees—all directly threatened by the course, are provided the same level of so-called protection as the course itself.**

San Francisco's own Historic Preservation Commission, the City's agency responsible for identifying and designating landmarks, disagreed with this assessment. **On September 21, 2011, the Commission ordered staff to prepare comments stating that they do not concur in the Recreation and Parks Department's position that Sharp Park retains historic integrity.**

There is good reason for this determination:

- The Recreation and Parks Department's Historic Resources Evaluation provides **insufficient information and evidence to support its conclusion that Sharp Park retains historic integrity.**
- The evaluation also **lacks a proper analysis of the historic landscape**, and thus there isn't an appropriate baseline to judge integrity.
- The Evaluation also **fails to consider a range of mitigation measures**, and thus precludes restoration of endangered species habitat. Historic preservation and natural resources protection are not exclusive – Crissy Field and Muir Woods restoration are examples of natural resource restoration projects where historic resources existed.
- The National Park Service has asked to play a role in any historic resource evaluation of the golf course – per their 2009 statement – because the course is within their historic boundary and they are undertaking a multi-million dollar wildlife habitat restoration project adjacent to Sharp Park, yet the City has not engaged the Park Service. **The Park Service is considered the most respected expert in historic resource preservation.**

Attached to this memo are previous statements by the National Park Service and the City of San Francisco opposing landmarking the golf course in Pacifica; written histories about how the course no longer retains integrity; and a link-by-link assessment of what has been lost at the golf course.

WILD Equity

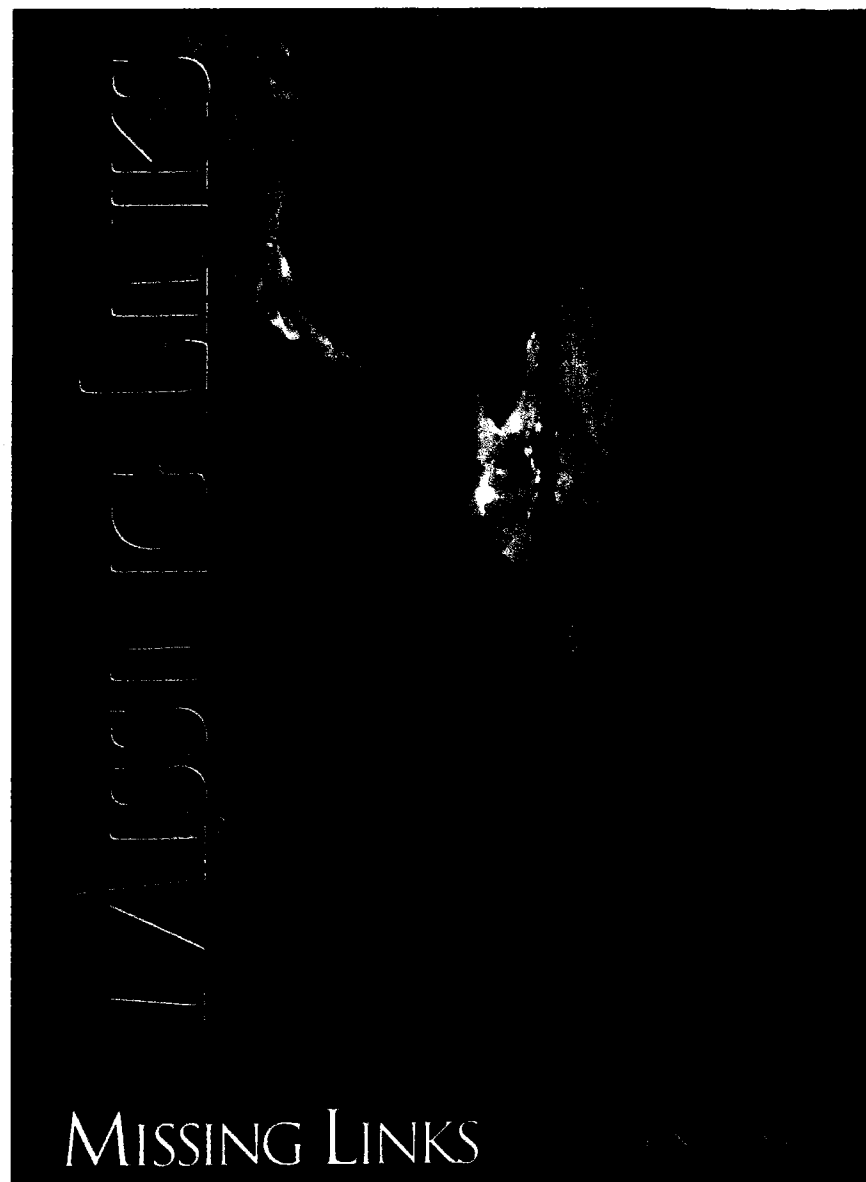
INSTITUTE

*Building a healthy and sustainable global community for people
and the plants and animals that accompany us on Earth*

Sharp Park today bears no resemblance to Alister MacKenzie's original design. **Every link has been changed at Sharp Park—in many cases radically, and many holes have been lost completely.** It is misleading to claim that any historical integrity exists at the course.

- The water features on five MacKenzie holes east of Laguna Salada, original holes 1, 9, 15, 16, & 17, have been culverted, eliminating crucial water hazards essential to his design.
- Five holes west of Laguna Salada, including original holes 3, 4, 6, 7, & 8 were destroyed completely by massive coastal storm surges and the subsequent construction of the berm.
- Two others, original holes 2 & 5, were severely damaged and modified to eliminate additional water features and other elements of their design. Now the site of hole 12, the original hole 2 was shortened by 60 yards and a stroke while the strategic features—including its proximity to a much larger Horse Stable Pond than exists currently—are almost completely irrelevant to the hole's play today. Hole number 5, which was considered by Jack Fleming to be "one of the most interesting holes on the course, similar to Dr. MacKenzie's 'ideal golf hole,'" is now the current site of hole 17, but other than occupying the same space the hole bears absolutely no resemblance to the original hole 5: a tee shot over Laguna Salada has been removed, and dual fairways have been combined into one, eliminating strategy alternatives integral to MacKenzie's design.
- Original holes 10 and 11, now the location of holes 14 and 15, have likewise been modified with changed greens and fairways that bear no resemblance to MacKenzie's layout. Indeed, Daniel Wexler argued that the original hole 10 was perhaps the course's best link, but its essential feature—a double fairway—no longer exists.
- Original hole 12, now the location of hole 18, has had sand traps removed from the design. In addition, original hole 13 (now 3), and original holes 14 and 15 (now the location of holes 8 and 2) described by Wexler as "not among the layout's finest" to begin with, have likewise had hazards reconfigured, as has the final original hole, 18 (now the location of hole 10).
- In addition, the theory of the course—the creation of a links-type, seaside course—was entirely upended when the berm was built separating the course from the ocean.

P.O. Box 191695 • San Francisco, CA • 94119 • P: 415-349-5787 • info@wildequity.org • <http://wildequity.org>



1943 aerial survey reveals a number of Mackenzie's original holes still intact, plus four newer ones built to the east. (National Archives)



SHARP PARK GOLF COURSE

PACIFICA, CA

Opened in 1931 / 6,154 yards Par-71

As today, some 65 years after his death, Dr. Alister MacKenzie remains perhaps the most celebrated golf architect in history, it is truly remarkable that two public courses he laid out in major American metropolises could have been so short-lived and poorly documented. Yet Bayside, as we have seen, labored in (and vanished into) almost complete obscurity—and it cannot even begin to compare with the briefly-lived legacy of San Francisco's Sharp Park.

MacKenzie's Sharp Park layout is surely one of golf architecture's most enduring mysteries. Owing to the fact that it was built in 1931, then washed into oblivion by a coastal storm shortly thereafter, its original design was seen firsthand by very few. Nor was this initial version in any way adequately recorded, with few photographs of any kind known to remain in existence. Further, a visit to today's 6,299-yard facility offers little; this vastly-altered layout serving mostly to make one wonder if a vintage MacKenzie design ever *could* have existed upon this site.

But the Doctor's original, located very much upon this same land, was all that its tantalizing prospects have suggested, a marvelous golf course featuring seaside holes, two double fairways, a large lake, and a cypress-dotted setting fairly reminiscent of Monterey. It was, in short, a municipal masterpiece.

Located just 10 miles south of downtown San Francisco, the site given to MacKenzie was uncommonly fine for a public facility, including a nearly 1,000-yard oceanfront stretch along Salada Beach. For a county whose public course facilities at Harding and Lincoln Parks were among the busiest in the nation, the development of Sharp Park was a godsend, but this wonderful property was not without its drawbacks.

For one thing, a fair amount of the land required shoring up with massive quantities of dredged sand in an expensive, Lido-like operation. Second, the site was partially divided by a small county road, a circumstance dictating that three of MacKenzie's back-nine holes be separated from their 15 brethren. Years later this road would be rerouted, though by that time the storm-driven reconfiguration of the golf course would still leave four newer holes separated, about the only commonality between MacKenzie's work and the course in play today.

The 1931 layout began with a dogleg-right par-4 of 400 yards, a strong but not especially memorable opener. But things changed quickly at the second, a 274-yard par-4 with alternate tees situated on either side of the first green. In what today might be referred to as "risk/reward" style, this nearly-driveable hole featured a large bunker front-right of the putting surface and a lake to the left of the fairway, creating the wonderful question of just how near the water one dared to venture in pursuit of an easier angle for his second.

The third was a long two-shotter of 423 yards, playing directly north along the beachfront. Again the risk/reward question was laid before us: play safely down the middle and deal with a front-right greenside bunker or aggressively skirt the beach in pursuit of an open second? Seaside winds generally affected play at Sharp Park greatly, bringing those most unlikeliest of obstacles—trees—into play along the right side as well.

Following the short fourth, a precise pitch played along the lake's westward shoreline, one reached the first of the dual-fairway holes, the 338-yard fifth. Here the player's options were numerous with a "safe" left-side route leaving the most difficult second-shot, a dangerous lakefront fairway opening up a more direct line, or the all-out blast over everything leaving a mere pitch from a wide-open angle. As at the second hole, a second tee positioned left of the previous green served to create additional angles and variety.

The 385-yard seventh was the course's second and last seaside hole, playing directly south to a long, narrow green flanked on either side by sand. The slight angling of the putting surface again tempted one to drive close to the beach (particularly if the pin was cut back-left), but the lesser presence of trees at least made this tee shot a bit more forgiving.

The 398-yard eighth, though built with only one fairway, offered two very distinct lines of play. A drive aimed safely left was simple enough but set up a nearly all-carry approach across two front-left greenside bunkers. For the man capable of controlling a long fade, however, there was the option of skirting the treeline, a shot which, if brought off successfully, again yielded a more favorable approach.

Though one hesitates to name a best hole among so many good ones, the 392-yard 10th did

a fine job of nominating itself. Here was the double fairway concept played out to the fullest, the right side providing ample safety but a bunker-obscured second, the left requiring a gutsy tee shot to a water-guarded fairway but yielding a straight-on approach. Yet again, dual tee boxes varied the challenge from day to day, making the 10th a truly great hole—but an intimidating prospect for anyone hoping to slip past the starter and begin play on the back nine.

Following the 142-yard 11th came the long 12th, a 493-yarder distinctly reachable in two, provided one avoided several prominent trees and the out-of-bounds which ran down the entire left side.

Perhaps not surprisingly, the three holes exiled across the county road were not among the layout's finest, the 345-yard 13th being the best of the bunch with out-of-bounds also threatening its more-favored left side.

With the routing having returned to the clubhouse for a third time, one set out again at the 363-yard 16th, a par-4 following much the same path as today's first hole. Here a large mound punctuated the fairway some 175 yards off the tee, offering several different angles of play. The more difficult drive was the one aimed down the right side, close to a clump of trees. Naturally this choice also provided the better approach angle to a deep, narrow putting surface.

MacKenzie closed out Sharp Park with a pair of long finishers beginning with the 471-yard 17th. Though not a particularly difficult hole, this short par-5 often faced a strong sea breeze and featured out-of-bounds left, two bunkers, a meandering brook and a green laid precariously close to a rough, marshy depression. The 18th, by contrast, was a bit of a monster, its 443 yards requiring more brute strength than finesse, though the ability to draw one's tee shot would obviously have come in handy.

It was indeed unfortunate for Sharp Park that so many of its best holes fell along the property's ocean side, for it was this flank which took the brunt of any incoming storms. Following the early 1930s deluge that washed several of these gems out to sea, a massive berm was constructed (largely upon land once occupied by holes three and seven) to prevent history from repeating itself. The subsequent rerouting of the county road and reconfiguring of the lakeside holes has further muddled things so that today only a handful of holes run consistent with MacKenzie's originals, and no appreciable trace of his strategy remains in play.

How Sharp Park Would Measure Up Today

Oceanfront holes, double fairways, MacKenzie bunkering, marvelous scenery...

Any way you look at it, even at only 6,154 yards, Sharp Park would have to stand well out in front as America's finest municipal golf course.

Recreation magazine

SHARP PARK

Being that the City had come by the lots at Sharp Park so cheaply (free in fact) they decided to bring in one of the world's foremost golf architects, Dr. Alister Mackenzie. The fact that Mackenzie and his assistant at that time, Jack Fleming, were able to design a golf course along the San Mateo County coast line was quite an accomplishment in itself. They managed to accomplish this difficult feat by dredging for fourteen months in order to build up the fairways.

On May 15, 1930 Robert Hunter, Jr. was appointed the superintendent of construction for Sharp Golf Course at a fee of \$750 for ten month's work. Four and a half months later on October 2, 1930 Willis Polk and Company was authorized to prepare plans and specifications for the starter's house at the golf course. The original cost of playing golf was \$2.00 per month and a card good for all three courses became available in May 1932 for \$5.00.

The courses's opening in 1932 was twice delayed due to wet conditions. The golf course officially opened April 1, 1932. Perhaps the fact that even the opening of the course had to be delayed twice due to winter rains should have warned of the drainage problems this site would always face. Normally a golf course will welcome the rest and revitalization the winter rains bring. In Sharp Park's case the winter rains brought about the annual flooding of Laguna Salada out on to playable portions of the golf course. This problem still persists 47 years later even though a 4,000 gallon water pump has been installed. Two factors contribute to the poor drainage problem at the Sharp Park site. First and foremost

is the fact that the course is built at sea level and thus was susceptible to changing tides. The second factor was the annual flooding of Laguna Salada itself.

The golf course that opened on April 1, 1932 was becoming increasingly popular until it was severely damaged by high tides in a storm during the winter of 1938. The holes constructed on or near the beach were undated by the unchecked tides of the storm. This resulted in severe damage to the beach holes - Numbers 2 through 8. The course, generally considered one of the best tests of golf in Northern California would never be the same. The beach holes had to be abandoned and reconstruction was forced across the Coast Highway up into what is now referred to as "The Canyon Holes". The effect was much the same as taking a house with a beach view and turning it 180 degrees to face a mountain slope. This was the most drastic architectural change the Sharp Park layout would ever face. Even the State Highway construction in the early 1960's that wiped out one par three hole would not have as damaging effect as nature.

Sharp Park remains very busy to this day drawing players both from the City and from down the peninsula. During the winter, however, as the water table rises, the course becomes less playable and suffers a significant drop in play - more so than other municipal courses during the winter. One winter in the early 1970's flooding was so thorough that the unchecked water nearly reached the clubhouse.



City and County of San Francisco
Recreation and Park Department

McLaren Lodge in Golden Gate Park
501 Stryan Street, San Francisco, CA 94118
TEL: 415.831.2700 FAX: 415.831.2096

September 1, 2009

Honorable Julie Lancelle
Mayor, City of Pacifica
City of Pacifica City Hall
170 Santa Maria Avenue
Pacifica, CA 94044

Michael Crabtree, Planning Director
City of Pacifica
Planning Department
1800 Francisco Blvd.
Pacifica, CA 94044

Re: Proposed Designation of Sharp Park Golf Course as a Pacifica City Landmark

Dear Mayor Lancelle and Director Crabtree,

I am writing in regard to the City of Pacifica's application to designate the Sharp Park Golf Course a Historic Landmark under Pacifica Municipal Code, Chapter 7. We think this action is both inappropriate and unnecessary. Under California law, the City of Pacifica cannot regulate land use at Sharp Park which is owned by the City and County of San Francisco. (See, Cal. Govt. Code §§ 53090, et seq., *Akins v. County of Sonoma*, 87 Cal. 2d 185 (1987).) Therefore, any designation of the Sharp Park Golf Course as a historic landmark by the City of Pacifica will have no legal effect and, frankly is not helpful in furthering a legitimate public policy debate here in San Francisco.

We certainly recognize that Sharp Park Golf Course is used and enjoyed not just by many San Franciscans, but also by the residents of Pacifica, and that your City is concerned about any potential changes to it, and particularly to the golf course. As you may know Sharp Park is approximately 400 acres -- 237 of those acres are included in the San Francisco Recreation and Park Department's Significant Natural Resource Areas Management Plan (SNRAMP). This Plan is currently undergoing environmental review under the California Environmental Quality Act. We appreciate the historic and cultural value of the golf course, and an evaluation of the effects of the SNRAMP on the golf course as a potential historical resource will be included in the SNRAMP EIR.

As you also likely know, the area around the Sharp Park Golf Course contains habitat that support two special status species: San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), listed as endangered under the federal Endangered Species Act, and classified as a fully protected species under California Fish and Game Code § 5050; and the California red-legged frog (*Rana draytonii*), listed as threatened under the federal Endangered Species Act and a state species of special concern. Under federal and state law, the City and County of San Francisco must ensure that the golf course operation does not endanger or harm either of these species. Recently, the San Francisco Board of Supervisors enacted legislation directing the Recreation and Park Department to develop a plan for



Mayor Gavin Newsom
General Manager Philip A. Ginsburg

restoring the habitat for the garter snake and red-legged frog in conformance with federal and state law. Currently, we are preparing option plans, including schedules and costs for presentation to the public and to the Board which we hope to have preliminarily completed in October 2009.

We take our stewardship responsibilities at Sharp Park very seriously. In a very difficult financial climate, we must manage the recreational, cultural and biological uses of the park in a manner that best balances legitimate recreational needs with our fiduciary and legal responsibility to protect the habitat. We will continue to include the City of Pacifica in our discussions as we evaluate plans Sharp Park's future.

Very truly yours,



Philip A. Ginsburg
General Manager

cc: Mayor Gavin Newsom
Members of the Board of Supervisors
City Attorney Dennis Herrera
Members of the Recreation and Park Commission



ON REPLY REFER TO:

L1415 (GOGA-PLAN)

July 20, 2009

Mr. Michael Crabtree
Planning Director
170 Santa Maria Avenue
Pacifica, CA 94044

Re: Proposed Historic Landmark Designation for Sharp Park Golf Course. HLD-6-09

Dear Mr. Crabtree:

Enclosed is our statement regarding the proposed action above. Please make this part of the July 20, 2009 City of Pacifica Planning Commission hearing. If you have any questions, contact Nancy Hornor at (415) 561-4937.

Sincerely,



Frank Dean
Acting General Superintendent

Enclosure:



United States Department of the Interior

NATIONAL PARK SERVICE
Golden Gate National Recreation Area
Fort Mason, San Francisco, California 94123

IN REPLY REFER TO:

NPS Statement on Pacifica Landmark Designation for Sharp Park

July 20, 2009

We learned of the City of Pacifica's proposal to designate Sharp Park Golf Course as a Pacifica Historic Landmark when we received the public hearing notice. We were not notified of this proposal through the Pacifica GGNRA Advisory Committee, which was set up by the Pacifica City Council to discuss items pertinent to both bodies.

As you know, Sharp Park is within the boundary of the Golden Gate National Recreation Area and adjacent to lands that we manage at Sweeney Ridge and Mori Point. We are currently completing a multi-year restoration project at Mori Point, to protect the Endangered San Francisco Garter snake and the threatened Red-legged frog and provide for compatible recreation and community stewardship and educational activities. Therefore, we have an interest in the future of Sharp Park.

Although we concur that the golf course and club house, as well as the remains of the WWII internment camp, should be evaluated, we request that you not make a landmark designation without a professional assessment of the significance and integrity of the property. We can assist with such an evaluation and would like to work with City of Pacifica and the City of San Francisco to define an appropriate process that includes all stakeholders.



**SAN FRANCISCO
PLANNING DEPARTMENT**

September 26, 2011

Mr. Bill Wycko
Environmental Review Officer
San Francisco Planning Department
1650 Mission Street, 4th Floor
San Francisco, CA 94103

Dear Mr. Wycko,

On September 21, 2011, the Historic Preservation Commission (HPC) held a public hearing and took public comment on the Draft Environmental Impact Report (DEIR) for the proposed Significant Natural Resources Area Management Plan. After discussion, the HPC arrived at the comments below:

- The HPC did not have consensus on the historical integrity of the Sharp Park Golf Course. Some commissioners thought that the property does not retain sufficient integrity to convey the property's historical significance per the National Register of Historic Places and/or California Register of Historical Resources, while others thought that the property does retain sufficient integrity.
- The HPC suggest that the mitigation measure described in M-CP-1 (Page 11) should be modified to specify that the future historic resource evaluations should be completed by a qualified professional landscape architectural historian.
- The HPC suggests that the mitigation measure described in M-CP-7 (Page 13) should be modified to specify that a qualified professional landscape architectural historian should be retained to document the cultural landscape.
- The HPC suggests that implementation of the Sharp Park restoration activity to construct a post and rail fence along the seawall of the golf course described in I-CP- 8 (Page 14) would cause a substantial adverse change in the significance of the Sharp Park Golf Course.
- The HPC also commented that it is likely that future projects involving federal permitting or funding will be reviewed and commented on by the Commission as part of the National Environmental Policy Act (NEPA) process.

The HPC appreciates the opportunity to participate in review of this environmental document.

Sincerely,

Charles Chase, President
Historic Preservation Commission

www.sfplanning.org

San Francisco
San Francisco, CA 94103-2419

Reception:
415.558.8378

Fax:
415.558.8400

Planning
Information:
415.558.8377



MEMORANDUM FOR RECORD

FILE NUMBER: 2010-00327
PROJECT: Sharp Park Pump Maintenance
DATE: 9/29/10
SUBJECT: NPR

Proposed Site: The project site is located in a portion of a wetland located within the Laguna Salada Restoration Project located within Sharp Park, in the city of Pacifica, San Mateo County, California.

Proposed Project: The San Francisco Recreation and Parks Department proposes to dredge a small area (68 sq. feet) within Laguna Salada wetland to maintain the pumps that convey storm flows from the lagoon to the ocean.

A trash Debris pump would be used to suck the sediment in a 4 foot by 8 foot by 2 foot area in front of the intake structures. Sediment would also be removed from the intake box. On September 23, the project was discussed further with the applicant's agent. He confirmed that no fill in the wetland would occur. The site would be access from upland roads or the seawall associated with the wetland. The sediment would be deposited on uplands occupied ice plant as indicated on the delineation map verified by the Corps. Additionally, no coffer dam would be required to complete the work.

Project Background: A wetland delineation was verified by Project Manager, Ian Liffmann (file 209-00044). On August 17, 2010 a letter requesting approval to complete the dredging was submitted. On September 8, 2010 the DMMO office confirmed that the project is not navigational dredging and therefore should be handled by the Regulatory Office.

Site Visit: None completed.

Jurisdictional Determination: None Completed.

Endangered Species: There are known occurrences of California red-legged frog and San Francisco Garter Snake within Sharp Park Golf Course. The letter should clearly indicate that although no permit is required, that compliance with federal ESA is still required. This topic was further reviewed by the Project Manager, Paula Gill and the applicant's agent David Munro on September 23, 2010.

Historic Properties: None are expected to occur.

Corps Recommendations: The proposed project does not trigger the need for a USACE permit.


Paula Gill, Project Manager

9/29/10
Date

CESPN-OR-R



Memo For The Record

Project Manager: Ian Liffmann

Attendees: Kelly Bayer, Daniel LaForte, David Munro, Katerina Galacatos, Ian Liffmann

File No.: 2009-00044S

Date: March 2, 2009

Subject: Site visit (February 18, 2009) and decision to issue JD verification letter.

Site Location: The Laguna Salada Wetland Restoration and Habitat Recovery Project is located in the Sharp Park Golf Course, in the City of Pacifica, San Mateo County, California.

Proposed Project: The project will involve re-working the wetlands and open waters within the golf course in order to create potentially better habitat for the San Francisco garter snake and the California red-legged frog, and to stabilize the fluctuations in the water level of the wetlands by creating better flow to the pump station that regulates the water level. A formal application for the project has not been received yet- at this point it is only a JD verification.

Notes/Site Inspection: The site was heavily flooded when we visited it- the main pump to the ocean was broken, and thus water was backing up and flooding the wetlands and the golf course. The wetlands and golf course are situated behind a levee that separates them from the Pacific Ocean. Before the levee was constructed this area was a tidal lagoon.

JD: The Corps has jurisdiction of the pond and the wetlands up to the ordinary high water mark.

Federally Listed Species Issues: The site is home to the San Francisco garter snake and the California red-legged frog.

Impacts to Corps Jurisdiction: A formal project application has not been received yet, but initial conversation indicate that the project may propose the filling of up to 5 acres of wetlands. I had a conversation with the consultants about the fact that all of these impacts would have to be mitigated for (even if they were beneficial for wildlife), and that it was possible that a combination of on and off site mitigation could compensate appropriately, but that minimizing as much of this fill as possible should be the number one priority.

Mitigation Proposal: A formal mitigation proposal has not been received.

Historic Properties: There are no historic properties at this site.

Corps Staff Recommendations: Since the site's water is regulated artificially, coming to a decision on an exact boundary of the wetlands and waters would be difficult. The map that the consultants provided is a good representation of what the site would normally look like if the pump was working, which would be different than it was when the site was visited. Because the water could be kept at any number of levels artificially, I believe that the map that was provided would be a good representation of the normal level that the wetlands and waters extend to, and therefore a JD letter verifying this map as accurate should be sent.

EXHIBIT J

San Francisco
Department of Public
WorksSharp Park
Sharp Park Sea Wall
Evaluation

December 2009

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Arup North America Ltd
560 Mission Street, Suite 1900, San Francisco, CA 94105
Tel +1 415 687 4444 Fax +1 415 687 9095
www.arup.com

Job number 211219

2.3 Task 3 – Saltwater Intrusion Evaluation

Arup reviewed existing salinity data of Laguna Salada collected by the SFRPD. The purpose of the review was to identify if water is penetrating the Sea Wall and entering the wetlands. We also visually inspected the Sea Wall to determine if noticeable areas of salt water intrusion are present.

3 Site History

3.1 Acquisition and Building of the Golf Course

The City and County of San Francisco acquired the property of Sharp Park in 1916-1917 through an indirect bequest by Mrs. Honora Sharp. The property came with the stipulation that the property be used only for a public park or playground. The decision to build a Golf Course took place in 1929 and it was completed in 1932. It was designed by Dr. Allister McKenzie along with Robert Hunter (Geomatrix 1987).

3.2 Building of the Sea Wall

The first unarmored earthen Sea Wall embankment at the site was built between 1941 and 1952 to protect the golf course from waves and flooding (Philip Williams & Associates [PWA] 1992). From that time until a major storm in 1983, maintenance was periodically performed on the Sea Wall embankment.

3.3 Major Storms and Erosion of Coastline

Since 1931, between 200 to 300 ft of beach has been lost due to shoreline erosion, including 16 acres of the golf course. A majority of this erosion has occurred during major storms. The most noteworthy have been in 1958, when most of the golf course was submerged due to wave overflow and storm inflows, and January 1983, when a large portion of the Sea Wall was breached and large amounts of sand were carried onto the golf course (PWA 1992).

3.4 Reconstruction of Sea Wall in 1989

After the 1983 breach, the City and County of San Francisco took measures to prevent erosion of the Sea Wall on a large scale. In 1984, a geotechnical study titled Restoration of Coastal Embankment; Sharp Park Golf Course was performed by Woodward-Clyde Consultants, which looked at the soils underlying the Sea Wall and the area in the immediate vicinity. In 1987, a feasibility study was conducted by Geomatrix Consultants titled Restoration of the Coastal Embankment; Sharp Park Golf Course, which looked at various design alternatives for the Sea Wall. In 1989, a reconstructed Sea Wall was completed which spanned the entire 3,200 ft of coastline at Sharp Park. Several years later, the northern 1,140 ft of the Sea Wall was lightly armored to protect against wave action. Then, between 1997 and 2000, the southern 285 ft of the Sea Wall was also armored.

4 Review of Available Data

4.1 Available Geotechnical Data

The majority of the available geotechnical data for the site is in the 1984 geotechnical study by Woodward-Clyde Consultants. For this report, eight borings were drilled along the Sea Wall and engineering laboratory tests were conducted on the collected soil samples. The report presents several potential designs for the Sea Wall.

In this report, six of the eight borings show loose to dense Beach sand over their entire depth, which is 14.5 to 20.5 ft below the bottom of the Sea Wall. Two boreholes in the area west of the southern portion of the Sea Wall show silty clay below the Beach sand. In one borehole the silty sand goes from 20 ft to the bottom of the borehole at 24.5 ft. In the other borehole, the silty sand is present from 22 to 28 ft and is underlain by sandy gravel that extends to the bottom of the borehole at 29.5 ft. The surface elevations of the boreholes are not given in the report (Woodward-Clyde 1984b).

Another 1984 study by Woodward-Clyde Consultants titled Design Memorandum, Beach Boulevard Seawall provides subsurface information at the northern-most edge of the Sea Wall alignment. In this report, 5 boreholes are within 400 ft of the Sea Wall alignment and were considered relevant to this project. They show loose to medium dense, fine-grained sand at the ground surface to elevation 3.6 to -4.5 ft (NGVD29). Below the sand is medium stiff to very stiff, silty or sandy clay, which extends to the bottom of the boreholes at elevation 0.6 to -10.3 ft (NGVD29) (Woodward-Clyde 1984a).

4.2 Aerial Photographs

Fourteen aerial photographs were obtained from Pacific Aerial of Oakland, CA for the area of the Sharp Park Sea Wall. The earliest photograph obtained is from 1946 while the latest is from 2000. In the 1946 to 1969 photographs, the crest of the Sea Wall appears to be low and non-uniform, as shown in the 1946 photograph (Figure 3). In 1972, a well-defined Sea Wall appears over the northern half of the alignment (Figure 4) but appears to deteriorate through 1981. In 1983, the Sea Wall is no longer visible as it was breached and eroded in the January 1983 storm (Figure 5). In 1985, it seems that minor repairs have been done along the alignment, and in 1989 the Sea Wall appears in its current form (Figure 6). In 1991, the rip rap on the northern section is present. The rip rap on the southern section is visible in the 2000 photo (Figure 7).

4.3 Current Tidal Data and 100-year Flood Estimate

The three nearest tidal stations to the Sharp Park Golf Course are Ocean Beach, San Francisco Bar, and Half Moon Bay. Daily tidal predictions are available for these stations from the National Oceanic and Atmospheric Administration (NOAA). However, these stations do not present data in terms of absolute datums and therefore were not used. The nearest station that has datums available is San Francisco (Golden Gate). At this location, the Mean Highest High Water (MHHW) level is 5.84 ft above the Mean Lowest Low Water (MLLW) level. This corresponds to a MHHW level of elevation 5.92 ft in the NAVD88 datum. The highest water level recorded at this station during the period of 1983 to 2001 was 8.74 ft (NAVD88) on January 27, 1983 (NOAA 2009).

The Base Flood Elevation (BFE) at the Pacific Ocean, at Sharp Park State Beach, located approximately 2,000 ft north of the site, is 29.7 ft (NAVD88). The BFE is the elevation to which floodwaters are expected to rise to during a 100-year flood (Federal Emergency Management Agency [FEMA] 2009). A 100-year flood is the flood that has a 1% chance of occurring every year. The definition is the same for a 100-year storm.

4.4 Previous Coastal Design Criteria

In the previous design and feasibility studies performed by Woodward-Clyde Consultants (1984) and Geomatrix Consultants (1987), coastal design criteria were presented for the design of the Sea Wall. In the Woodward-Clyde report, a design still water level of 9 ft (MLLW) was assumed. A design wave height of 12.7 ft (MLLW) was assumed.



Photograph: AV9-13-1
Date: 7-29-1946

HISTORICAL AERIAL PHOTOGRAPH 1946

Sharp Park
Sharp Park Sea Wall Evaluation - Draft
Department of Public Works
San Francisco, California

December 2009

ARUP

FIGURE 3



Photograph: AV-1045-02-23
Date: 5-11-1972

HISTORICAL AERIAL PHOTOGRAPH: 1972

Sharp Park
Sharp Park Sea Wall Evaluation - Draft
Department of Public Works
San Francisco, California

December 2009

ARUP

FIGURE 4



Photograph: AV-2285-01-18
Date: 6-6-1983

HISTORICAL AERIAL PHOTOGRAPH: 1983

Sharp Park
Sharp Park Sea Wall Evaluation - Draft
Department of Public Works
San Francisco, California

December 2009

ARUP

FIGURE 5



Photograph: AV3556 1 18
Date: 6-19-1989

HISTORICAL AERIAL PHOTOGRAPH: 1989
Sharp Park
Sharp Park Sea Wall Evaluation - Draft
Department of Public Works
San Francisco, California
December 2009

ARUP

FIGURE 6



Photograph: SMT AV 6600 2 15
Date: 8-15-2000

HISTORICAL AERIAL PHOTOGRAPH, 2000
Sharp Park
Sharp Park Sea Wall Evaluation - Draft
Department of Public Works
San Francisco, California
December 2009

ARUP

FIGURE 7

EXHIBIT K

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

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
NORTHERN DIVISION

WILD EQUITY INSTITUTE, a non-profit
corporation, *et al.*
Plaintiffs,
v.
CITY AND COUNTY OF SAN
FRANCISCO, *et al.*,
Defendants.

Case No.: 3:11-CV-00958 SI

WENDY DEXTER EXPERT REPORT

1. I am submitting this expert report on behalf of plaintiffs in this case.

BACKGROUND AND QUALIFICATIONS

2. I am the President and Principal Biologist at Condor Country Consulting, Inc., a biological consulting firm I founded ten years ago. For the past twenty years I have worked professionally as a wildlife biologist, with an emphasis on herpetology, i.e., the study of amphibians and reptiles. Through my work I have conducted special-status species surveys and prepared biological reports for projects requiring permits from federal and state agencies, including Endangered Species Act permits from the United States Fish and Wildlife Service. In this capacity, I have provided my expertise to many public entities, including the San Francisco Public Utilities Commission, Caltrans, San Mateo County Public Works, and many other public agencies. I am a member of several professional organizations, including the Wildlife Society, the Society for Conservation Biology, and the Society for the Study of Amphibians and Reptiles.

3. I received a B.S. in Environmental Planning and Management from U.C. Davis in 1990, and completed my graduate coursework in Biology at California State University at Hayward in 1998. Sam McGinnis, PhD. was my major professor and under his tutelage I worked on several research projects collecting data on the San Francisco gartersnake (*Thamnophis sirtalis tetrataenia*, SFGS) and the California red-legged frog (*Rana draytonii*, CRLF).

1 4. I am one of a small number of professional biologists permitted by both the United
2 States Fish and Wildlife Service and the California Department of Fish and Game to carry out
3 recovery actions on the SFGS. I am therefore one of a few individuals authorized to study and
4 implement recovery actions for this subspecies. I am also permitted to work with the CRLF and
5 other federal and state-listed threatened and endangered herpetofauna (reptiles and amphibians)
6 by these agencies.

7 5. I have studied almost a significant number of the peer-reviewed journal articles and
8 books that address life history aspects of SFGS and CRLF, in addition to various master's
9 theses, Environmental Impact Reports, habitat assessments, Biological Opinions, and Biological
10 Assessments that contained information or opinions on these species. I have also reviewed
11 historic accounts of SFGS in Wade Fox's papers, and of CRLF in Storer's 1925 A Synopsis of
12 the Amphibia of California.¹

13 6. I have conducted several studies on lands where the SFGS and the CRLF occur, logging
14 hundreds of hours searching for, identifying, and monitoring these species during all life stages.
15 For example, I have performed population studies of SFGS at the Pescadero Marsh State Park,
16 Crystal Springs Reservoir, and West of Bayshore properties. I have participated in habitat
17 enhancement efforts including pond construction, dredging of aquatic habitat, and vegetation
18 management and enhancement at several other sites throughout San Mateo County. In addition,
19 I have trapped or performed visual surveys for SFGS at seven other locations. All but two of
20 these projects also included either studying, protecting, or enhancing habitat for the CRLF. I
21 have spent hundreds of hours observing, trapping, netting, capturing, relocating, and surveying
22 for this frog in counties throughout its range.

23 7. In the process of performing these studies I have discovered new populations of CRLF.
24 I have also assisted in the discovery that CRLF tadpoles can overwinter, and that female CRLF

25 ¹ At one time the California red-legged frog and the Northern red-legged frog were considered
26 two subspecies of *Rana aurora*. Today the California red-legged frog is considered its own
27 species, *Rana draytonii*. Nonetheless, observations that pre-date this taxonomic change can
28 still provide useful information about *Rana draytonii* if the observations are from areas where
only one of the two species was known to occur. The two subspecies did not overlap in range
at Sharp Park, so these older observations are relevant to our current knowledge of the frogs at
Sharp Park.

1 can vocalize when frightened or when desiring release during amplexus (as they are held)
2 where the male frog holds the female from behind in order to fertilize eggs as they are laid).
3 Both of these life history characteristics were undocumented prior to work on a project in
4 Contra Costa County where I and my colleague Jeff Alvarez first observed these phenomena.

5 8. Part of my profession is to determine project impacts on threatened and endangered
6 species. In the course of my career this work has prompted literature review and synthesis on a
7 variety of threats that could affect the CRLF and the SFGS. This research has focused on topics
8 such as wildlife mortality associated with vehicle collisions on roads (specifically focusing on
9 frogs, salamanders and snakes), noise and nighttime lighting impacts on sensitive bird and bat
10 species, vegetation management impacts to herpetofauna and avian species, ground disturbance
11 impacts to a host of species that live underground for some portion of the year (including CRLF
12 and SFGS), impacts associated with the introduction of invasive non-native fauna, as well as
13 large scale impacts associated with converting habitat to development. I have studied and
14 observed threats to individual animals, such as activities that directly "take" or injure and kill
15 these animals, and activities that impair important aspects of their life history through habitat
16 conversion and modification associated with flood control, water management, land clearing,
17 construction, and vegetation management.

18 9. For example, approximately ten years ago I was studying SFGS at the West of Bayshore
19 property. On a cold but sunny day in mid-October, I observed an SFGS basking early in the
20 morning on the levy road along cupid's row canal, an activity that put the animal at great risk of
21 being run over. I have also reported and examined an SFGS that was killed by a vehicle
22 traveling on a construction site at slow speeds in the same area and time period. The driver had
23 received species awareness training and direction on procedures necessary to keep from hitting
24 snakes. These experiences inform my recommendations about operating vehicles in SFGS
25 habitats, and the ability of operators to avoid harming these animals.

26 10. I have also spent dozens of hours monitoring vegetation removal in and around SFGS
27 aquatic habitat in several locations, including West of Bayshore and Woodside, and I have a
28 keen awareness of how difficult the snake is to detect, how quickly they can move in or out of

1 an area, and how difficult it is to remain alert and vigilant to the task at hand when an animal
2 has not been seen for hours or days. These experiences have informed my opinions about
3 protocols that purport to prevent take of these species by relying on visual detection of these
4 elusive animals.

5 11. Another part of my profession is to ensure that endangered species permits under state
6 and federal law are properly applied for, obtained, and complied with. I have worked on many
7 projects that have required incidental take approval from the U.S. Fish and Wildlife Service
8 under the Endangered Species Act, and I am very familiar with these permitting processes. I
9 have worked on projects that have had a federal nexus and therefore may be permitted through
10 the Section 7 Consultation process under the ESA, and on projects that do not have an obvious
11 federal nexus and require a Section 10 habitat conservation plan in order to obtain incidental
12 take authorization. For example, I worked on a small project that had both frog and snake
13 impacts, but had no federal nexus because the applicant was claiming no impact to Army Corps
14 of Engineers jurisdictional waters. A majority of my work consists of assisting clients with
15 permitting projects under existing HCPs, through Section 7 Consultation, or in the odd case
16 where both Section 10 and Section 7 Consultation are required. This experience includes
17 permitting dozens of projects that had the potential to impact CRLF or SFGS.

18 12. For example, in the past five years a client in Woodside was considering installing a golf
19 course on their property, which was habitat for SFGS. I spend a considerable amount of time
20 researching and considering how this might be accomplished for a subspecies listed as "fully
21 protected" under the California Fish and Game Code, but could not conceive of a golf course
22 where no take would occur.

23 13. I have also worked on many projects where CRLF were present, often in more than one
24 life stage (e.g. adults and tadpoles), where pumping was required. My experience with these
25 projects included assisting with the pump cage design and monitoring the cage to be sure that no
26 animals were trapped on the mesh. Through these experiences I have found that unless there is
27 a vigilant monitor clearing the fine mesh screen and very low water velocities, tadpoles become
28 entrained and either are sucked through the pump and killed or they are sucked against the mesh

1 and die because they cannot free themselves. All of these projects had take permits, but none of
2 them attempted to draw down the water in the pond during the timeframe when eggs or very
3 small tadpoles would be in the water.

4 14. Based on my professional experience and expertise with CRLF and SFGS, in 2009, I
5 was invited by the City and County of San Francisco to participate in a "peer-review panel" to
6 discuss the City's Conceptual Restoration Alternative Plan for Sharp Park. I am very familiar
7 with Sharp Park. I visited Sharp Park for several hours in August 2011, and based on that visit
8 and my review of all available reports (as outlined in Attachment B), it is my professional
9 opinion that Mori Point and Sharp Park constitute *one* population of the SFGS and *one*
10 population of the CRLF that function within a complex habitat mosaic. A SBI (2006) document
11 supports my opinion that the two properties constitute one population when it states "[b]ased on
12 size class data, a few individuals captured in 2004 and 2006 may represent young of year from
13 Fall 2003 and Fall 2005. This implies that SFGS at Mori Point are part of a breeding population
14 that occupies the Mori Point and Laguna Salada area. This population may also extend to the
15 south into the Calera Creek watershed where no physical boundaries exist between the parcels
16 and occurrence has been documented in the past (McGinnis 1990)."

17 15. My experiences there have also helped me understand the proximity of the mowed areas
18 to the aquatic habitat, and to understand how predators and scavengers, as well as prey
19 availability, may impact SFGS and CRLF populations, as well as our ability to detect these
20 species, at the site.

21 16. I have also reviewed documents regarding CRLF and SFGS at Sharp Park and the
22 surrounding lands (see Attachment B). I have reviewed these documents with a particular
23 interest in the differences between management approaches at Sharp Park—which conducts
24 several activities that create a population "sink"—an area where death rates exceed birth rates
25 due to poor quality habitat or impacts associated with disturbance—and management
26 approaches at the adjacent Mori Point National Park—where a robust recovery action is
27 ongoing, creating a population "source" for both species, continually introducing new snakes
28 and frogs into Sharp Park, despite the operations that make Sharp Park a sink.

1 17. More information about my work with CRLF and SFGS can be found in my resume,
2 which is attached as Exhibit A. My expert testimony in this report is based on the resources
3 described above, along with the documents listed on the attached Exhibit B as well as any other
4 materials discussed below. I am charging plaintiffs \$75 per hour for the time I spend reviewing
5 materials and providing deposition and trial testimony in this matter. I have not authored any
6 publications in the previous 10 years, and I have not testified as an expert at trial or by
7 deposition during the previous four years.

8 **REQUESTED TESTIMONY AND FACTS CONSIDERED**

9 18. Plaintiffs have requested that I provide my expert opinion and testimony regarding the
10 presence of San Francisco garter snakes at Sharp Park Golf Course; the effects of mowing
11 operations at Sharp Park Golf Course on the San Francisco garter snake population found there;
12 and the overall impacts the Golf Course's activities have on the population and the species.

13 **SAN FRANCISCO GARTER SNAKES ARE PRESENT AT SHARP PARK**

14 19. It is my professional judgment that the San Francisco gartersnake is present at Sharp
15 Park based on the continued observations of SFGS on the property and at the adjacent Mori
16 Point; on the fact that biologically speaking the Mori Point and Sharp Park populations are one
17 biological unit; and because suitable habitat exists at Sharp Park wherever the golf course
18 operations and management have not removed or degraded required elements of suitable
19 habitat.

20 20. Many studies from diverse sources indicate that SFGS has persisted at Sharp Park for
21 many decades, and continues to do so. Wade Fox, the first biologist to systematically survey
22 and record amphibian and reptile species at Sharp Park, found relatively large numbers of San
23 Francisco gartersnakes at Sharp Park in the 1940s, collecting 34 specimens there during ten
24 visits to the site in 1946. In 1978, Sean Barry observed 37 San Francisco gartersnakes near
25 Horse Stable Pond, and an additional 46 at Mori Point in ten visits, indicating a persistent
26 population at least on the southern edge of the golf course at that time. Extensive trapping in
27 the mid- to late-80s by Dr. Sam McGinnis captured only two San Francisco gartersnakes at
28 Sharp Park (SBI 2009), and while subsequent surveys conducted from 1990 to 1992 found 3

1 SFGS at Mori Point, but none at Sharp Park (PWA 1992 in SFRPD 2006). Swain (Biologist at
2 trapped one SFGS in the "marsh pond and stable area" (SBI 2009). Swain (Biologist at
3 Consulting (2005) reported capturing four SFGS at Horse Stable Pond and one at Laguna
4 Salada in 2004. SFGS were observed at Horse Stable Pond in 2005 (Camp 2005 in SFRPD
5 2006). SBI (2006) also reported four snakes trapped in 2004 at Sharp Park in the vicinity of
6 Horse Stable Pond and 6 or 7 trapped in the same vicinity in 2006. The discrepancy in the 2006
7 numbers is derived from a difference between the data in Figure 9 and Table 1 of the document.
8 In 2008, two San Francisco gartersnakes were observed at Sharp Park (SBI 2009); and between
9 2006 and 2011, 17 SFGS have been incidentally observed at Mori Point (Crooker email 2011).
10 Throughout this time period, several other San Francisco gartersnakes were also observed in
11 adjacent San Francisco Public Utility Commission watershed lands.

12 21. The absence of the snake from certain survey efforts demonstrate that negative findings
13 do not equate to extirpation of the species from a site. McGinnis performed two extensive
14 survey efforts in 1986 and 1988, capturing no SFGS at Sharp Park or Mori Point (SBI 2009).
15 Yet SFGS were detected in years after 1988. Those snakes did not likely come from afar to
16 recolonize this location. There was likely a small population that was just not detected during
17 the surveys. The idea that negative survey results are not the same as the species being absent
18 from the site is an idea supported by both CDFG and USFWS. Karen Swain describes it this
19 way in an email to a client:

20 "The primary reason a negative finding could not be accomplished in this study include
21 the documented presence of the SFGS population at Mori with no barriers or even
22 deterrents to movement between the sites and habitats, the historical presence in Calera
23 Creek -[sic] former quarry) and the continued presence of suitable habitat and abundant
24 prey species (including a federally listed species) there. It is also relevant to point out
25 population fluctuations in biological systems prevent establishment of an "absence
26 finding" for SFGS in this situation. I can cite two very specific examples of locations
27 where SFGS surveys have been conducted with none found in one survey and
28 subsequently conducted in the same location in following (consecutive or with many
years in between), one of those being Mori Point and the other a site on SF PUC property
where Dr. McGinnis did a 90 day study below Crystal Springs Dam and got no SFGS
(I'm not sure what year) and we trapped in 2007 and got an SFGS within one month."

22. The variable survey effort and reported captures within Sharp Park provide an unreliable
picture of the SFGS population through time because different techniques (trapping, hand

1 capture, and incidental observations) with varying success rates were used and because levels of
2 effort and survey timing (time of year) varied widely. The best population comparisons
3 available are those of Fox and Barry because they both constitute ten days of survey effort and
4 they both used a hand capture technique. Given that the population appeared to remain fairly
5 stable between those two survey efforts, it is interesting to note that major flood events occurred
6 in 1938 (Faulkner 1979), eight years prior to Wade Fox's survey, and in 1958 (Geomatrix 1987)
7 and January of 1978 (FEMA 1987), 20 years and immediately prior to Barry's survey. Other
8 major flooding occurred in the winters of 1978 and 1983. It is obvious that both the snake and
9 its prey, CRLF and Sierran treefrog, have survived many large storm events that may have
10 temporarily increased the salinity of a portion of the aquatic habitat available to them in Sharp
11 Park. The mosaic of habitat provided by the creek, ponds and marshes allow these species to
12 move away from saline habitats into fresh water habitats until they recover.

13 23. Although the most recent sightings of SFGS have occurred at Mori Point, this does not
14 mean SFGS are no longer present at Sharp Park. Sharp Park and Mori Point share a contiguous
15 boundary of suitable habitat, from Horse Stable Pond east to Fairway Drive. These areas are
16 connected with suitable habitat through the slough/connector channel to Laguna Salada. SFGS
17 found at Mori Point therefore have suitable habitat to reach Sharp Park, and vice versa.

18 24. Moreover, telemetry studies of the snake determined that the species conducts its daily
19 routines within one to two hundred meters of aquatic foraging habitat (Larsen 1994; SFGS 5-
20 Year Review). In some instances, forays of up to 671 meters were recorded (Larsen 1994).
21 Several areas where SFGS have been recently observed at Mori Point are within one to two
22 hundred meters of Sharp Park, including Mori Point ponds that were restored as part of an
23 SFGS and CRLF recovery action implemented by the National Park Service.

24 25. There is even evidence from snakes at Sharp Park that indicate individuals found there
25 use both Mori Point and Sharp Park habitats. In 1978 Sean Barry recaptured a snake at Mori
26 Point that he had originally captured and marked at Sharp Park two years prior, about a half
27 mile away. This information supports the assertion that SFGS will continuously move through
28 the Mori Point Sharp Park population, from Laguna Salada and Horse Stable Pond at Sharp

1 Park to Mori Point ponds, because the areas contain contiguous suitable foraging and upland
2 habitat.

3 26. While SFGS have not been observed at Laguna Salada in recent years, they have been
4 observed within Sharp Park at Horse Stable Pond during every trapline survey conducted in
5 recent times. Since the last trapline survey was conducted in 2008, only visual, opportunistic
6 surveys for SFGS have occurred at Sharp Park. However, while a visual survey can confirm
7 presence of SFGS when one is found, as explained above, a failure to detect the species does not
8 mean the species is not present. San Francisco gartersnakes are difficult to find, even under
9 favorable conditions. The subspecies is relatively small, secretive, and cryptic. In addition, its
10 preferred habitats make visual observation difficult. Because of this, one cannot conclude that
11 the subspecies is no longer present simply because you have not visually observed it.

12 27. My opinion that SFGS continue to be present at Sharp Park is consistent with every
13 written document prepared by the City's Natural Resource Program Manager Lisa Wayne, who
14 has repeatedly written that SFGS are found at Sharp Park. My opinion is also consistent with
15 the conclusions of Karen Swaim, a consultant working for the City, who has repeatedly
16 determined that SFGS are present at Sharp Park. To my knowledge, not a single biologist,
17 herpetologist, or regulatory agency has ever determined that SFGS no longer inhabit Sharp
18 Park.

19 **GOLF COURSE OPERATIONS ARE TAKING**
20 **THE SAN FRANCISCO GARTER SNAKE**

21 28. Many different golf course activities are harming the San Francisco gartersnake, both
22 directly and indirectly. These activities include golf cart use both on and off golf cart paths,
23 which is reasonably certain to crush San Francisco gartersnakes, and mowing, which is
24 reasonably certain to kill both snakes and frogs with mower blades or crush them with the
25 mower's wheels.

26 29. It is my professional opinion that the San Francisco gartersnake's habitat at Sharp Park
27 is not secure, and that the subspecies has been taken, and will continue to be taken in the
28 foreseeable future, by the continued operations and management of Sharp Park Golf Course.

1 30. As will be explained below, it is my professional opinion that these take events have
2 occurred more frequently than observed in the past, and will continue to occur in the future
3 unless the relief requested in this case is provided.

4 31. SFGS, like most gartersnakes, feed in aquatic features like ponds and lagoons. The
5 snake is also an obligate basker, meaning that it needs to bask in the sun in order to function
6 well, so it seeks open uplands adjacent to suitable foraging habitat to warm itself.

7 32. Nearly all of the areas surrounding Laguna Salada and Horse Stable Pond are mowed
8 regularly by the golf course, very near or immediately adjacent to the wetland edge. This leaves
9 a very narrow band of emergent wetland habitat between the open water areas of the lagoon and
10 the golf course links, and no protected upland in which SFGS can bask, breed, or seek refuge in
11 a burrow. Beyond the narrow band of emergent vegetation, SFGS would face a very high
12 likelihood of being taken directly by mowing operations.

13 33. Upon inspecting the golf course on August 28, 2011, it is clear to me that the City is
14 mowing aquatic vegetation, i.e., it is directly mowing wetland habitats that are important for the
15 San Francisco gartersnake. This alone creates a high degree of certainty that a San Francisco
16 gartersnake will be taken by golf course mowing operations. These areas are important habitats
17 for San Francisco gartersnakes, and there is a high probability that lawn mowing activities there
18 will result in take of the snake. This is in part due to the fact that, from a snake's perspective,
19 cover equals safety, so any snake basking near or foraging in or near this habitat edge will seek
20 cover in the edge habitat if disturbed. If that disturbance is an approaching lawn mower, the
21 snake will feel protected by the cover even though that cover is exactly what the mower is
22 removing.

23 34. Moreover, mowing activities eliminate cover and shelter for the gartersnake, making
24 them more susceptible to predation events. This habitat modification is therefore leading
25 directly to injury and death of individual animals, taking the gartersnake.

26 35. It is reasonable to expect that snakes are almost constantly moving between and among
27 all aquatic habitat at Sharp Park and Mori Point and that some portion of the population will
28 forage and disperse into the Laguna Salada area, a straight line distance of less than 350 meters

1 from one Mori Point pond. As SFGS move from Mori Point to Laguna Salada, they are
2 exposed to activities like lawn mowing that can harm or kill individual snakes. It is likely that
3 these SFGS will be killed by mowing so long as mowing occurs within the normal activity
4 range of the SFGS.

5 36. The United States Fish and Wildlife Service stated in its 2006 Five-year Status Review
6 of the San Francisco Gartersnake that a dead SFGS found at Sharp Park in 2005 had been killed
7 by a golf course lawn mower. I have reviewed the photographs of this snake, read the
8 correspondence that accompanied the file, and reviewed photos of other snakes injured or killed
9 by lawnmowers that I found and I concur that the snake was likely killed either by the wheels
10 and blades of a lawn mower or by another mechanized vehicle, such as a golf cart. I identified
11 two compression wounds on the snake that could have been made by either mower or golf cart
12 wheels, one above the tail end of the snake and one anterior to the middle of the snake that
13 would have crushed vital organs. In addition, there are a number of lacerations along the entire
14 length of the snake's body that are characteristic of blade cuts. These include cuts where the
15 flaps of skin remain and locations where large chunks of flesh were removed (mid-body) and
16 removal of a portion of the tail.

17 37. It is my professional opinion that many more San Francisco gartersnakes likely have
18 been killed by mowing and golf cart operations in the past, and that more will likely be killed in
19 the foreseeable future. Detecting dead San Francisco gartersnakes is very difficult to do,
20 because snake carcasses are rapidly scavenged. Several studies documenting wildlife mortality
21 on roads have also quantified the percentage of mortalities not detected due to scavenging. In a
22 study by Antworth et al. (2005), researchers planted dead snakes in the median and on the side
23 of a busy road and then monitored the carcasses at two-hour intervals to determine the
24 percentage of carcasses that are missed in roadkill surveys. They used dead snakes and chicks as
25 carcasses and found that there was about an 85% chance of encountering a dead snake on the
26 road within 2 hours of the carcass being placed there. At 4 hours the chance of encounter
27 decreased to less than 50%, and after 24 hours the chance of encounter was less than 10%.

1 38. While visiting Sharp Park in August, 2011, I observed many potential scavengers of
2 snake carcasses. I observed a red fox hunting on the golf course for more than an hour. I also
3 observed a group of at least five ravens perched on the dead cypress trees adjacent to Laguna
4 Salada. Both species are likely to scavenge injured, dying, or dead snakes from the golf course
5 during the day, and the fox would also take them at night. So on the golf course, where
6 scavenging is safer than on the busy road, there is likely at least a 50% chance that a snake
7 killed there will be scavenged within 4 hours. Given that potential for decreased detection and
8 the fact that nobody is assigned to look for dead snakes at Sharp Park, I am certain that
9 undocumented deaths of snakes occur annually, if not more frequently.

10 39. Similarly, golf cart operations, both on and off golf cart pathways, are likely to take San
11 Francisco gartersnakes. Gartersnakes need to bask in the sun to regulate bodily functions such
12 as body temperature and digestion, and the paved golf cart paths absorb and store heat,
13 providing snakes exceptional opportunities for quick warming on cold sunny mornings,
14 throughout the day, and even after the sun has set. Golf carts are particularly well known to
15 cause harm to snakes, even at slow speeds. One researcher, needing dead snakes to study the
16 effects of scavenging on roadkill detection rates, found that golf carts killed many snakes and
17 collected dead snakes from areas with known golf cart activities. Snakes killed in this manner
18 were used as a prey source in his study (DeGregorio 2011).

19 40. Because CRLF and treefrogs, both pond/pool breeders, are an important component of
20 the snake's diet, the population size of these species directly impacts the population size of
21 SFGS. Management of aquatic habitat that affects water depth during the egg laying and
22 maturation season can significantly affect the size of the prey population. Golf course
23 management activities that lower water levels once eggs have been laid will leave egg masses
24 above the water level to desiccate and die. Reduced numbers of frogs means reduced foraging
25 opportunities for the snake and an increased risk of death from starvation or predation due to
26 spending more time actively foraging.

1 41. It is my professional opinion that mowing, golf cart use, and other habitat modifying
2 activities like pumping are taking SFGS at Sharp Park, and will continue to do so unless these
3 activities are stopped.

4 **DEFENDANTS' COMPLIANCE PLAN IS NOT SUFFICIENT TO PREVENT TAKE OF**
5 **SAN FRANCISCO GARTER SNAKES AT SHARP PARK**

6 42. After 2008, the City released a Final Draft Endangered Species Compliance Plan for
7 Sharp Park. Upon review of this plan it is my professional judgment that the plan is unworkable
8 and cannot reduce take to levels that would obviate the need for Endangered Species Act
9 permits.

10 43. Even if it were complied with, the City's compliance plan cannot eliminate take of
11 SFGS by the golf course because under the plan mowing and golf cart use will still occur within
12 the snake's known daily activity range around Laguna Salada and other foraging habitats at
13 Sharp Park. Under the compliance plan, some of these areas will not even be monitored for
14 SFGS before mowing and golf cart use occurs, virtually assuring that SFGS will be taken by
15 these activities.

16 44. In other areas, the compliance plan relies on biological monitors to visually observe
17 portions of the golf course before mowing occurs. Having spent hundreds of hours searching
18 for SFGS along the edge of their aquatic habitat and in uplands I have personal experience that
19 informs my opinion that these animals are too fast and difficult to detect effectively, especially
20 where there is any change in vegetation or change in topography. It is simply unrealistic to
21 expect even a trained eye to detect every SFGS that will be in harm's way. These snakes are
22 fast and wary. The compliance plan relies on biological monitors being able to scan acres of
23 habitat with 100% reliability and certainty that all frogs and snakes will be observed, moved, or
24 lawn mowing delayed until the subspecies are clear from danger. However, the protocol
25 implemented cannot reach this level of certainty, and will inevitably result in an under-
26 observance of frogs and snakes. I know from experience that maintaining that kind of focus,
27 especially when you have not seen your target species in a long time, requires uncommon levels
28 of discipline, motivation, and focus.

1 45. Moreover, it is my understanding that in fact the only monitoring conducted before
2 mowing activities is by the golf course mowing staff, and that monitoring may not occur at all
3 or in some cases more than three hours before the mowing (Kappelman Deposition, pp. 51-56).
4 Under these circumstances it is even more certain that SFGS and CRLF are being taken as a
5 result of mowing activities at Sharp Park. As discussed above, an experience biologist may
6 find it difficult to detect these animals when they have not seen one after hours or days of
7 unsuccessful searching. These are professionals that likely have a search image in thought,
8 gained from previous observations. In addition, I have often witnessed the difference in the
9 level of vigilance between a professional biologist searching for an animal and a layperson
10 trained to search for the same species. Though I cannot say that every biologist is more
11 conscientious than every layperson, I can say with certainty that from my experience, the
12 biologists do a far better job overall of detecting the target animal than the layperson. I believe
13 this to be attributable to the biologist's training and the interest level being greater than that of
14 the layperson with regard to the target animal. In addition, it is obvious that if the golf course
15 staff are not searching for the snake or frog before they mow, there is a high likelihood that take
16 of the SFGS and CRLF are occurring as a result.

17 46. For these reasons it is my professional opinion that to avoid take of these species all
18 mowing and cart use within the known daily activity range of SFGS, roughly one to two
19 hundred meters from the delineated wetland boundary area should be prohibited, which will
20 provide upland habitat for basking and other essential SFGS upland activity and a buffer
21 protecting SFGS and CRLF from the significant threats posed by mowing activities.

22 **IF GOLF COURSE OPERATIONS ARE NOT SUBSTANTIALLY CHANGED, THE**
23 **SAN FRANCISCO GARTER SNAKE POPULATION AT SHARP PARK MAY BE**
24 **LOST, SPECIES RECOVERY WILL BE IMPEDED, AND THE ENTIRE SPECIES**
25 **WILL BE PUT CLOSER TO EXTINCTION**

26 47. It is my professional opinion that unless the golf course operations that cause take of the
27 San Francisco gartersnake are halted in areas where the snake is likely to be found, the Sharp
28 Park/Mori Point population will continue to decline, increasing the potential for the population
to become extirpated. Because there are less than ten wild populations of SFGS known to exist,

1 each contributes significantly to the genetic diversity, distribution, and viability of
2 subspecies. The loss of even one population would result in the subspecies becoming
3 critically endangered, reduce genetic diversity, decrease its distribution, and ultimately making it
4 more vulnerable to extinction through stochastic events.

5 48. It is my professional opinion that Sharp Park is an extremely important recovery area for
6 the SFGS. Preservation and enhancement of this area is essential for the subspecies to recover,
7 and if areas like Sharp Park are not preserved and enhanced for the benefit of the subspecies, the
8 subspecies may go extinct. In my opinion, the potential for Sharp Park to provide a habitat
9 connection from Coast Side to Bay Side populations of these species is critical to the
10 conservation and recovery of both species. Genetic interchange across these small, isolated
11 populations, even when infrequent, may preclude dangerous levels of inbreeding, disease, and
12 other deleterious harms that face small populations.

13
14 1/20/12
Date

14 s/Wendy Dexter
Wendy Dexter

15
16 I, Brent Plater, hereby attest that Wendy Dexter's concurrence in the submission of this
17 document has been obtained.

18 Executed on: January 20, 2012

19 
Brent Plater

EXHIBIT A



Wendy Dexter

President/Principal Biologist

Ms. Dexter has twenty years of professional experience as a wildlife biologist, emphasizing herpetology, raptor biology, and large freshwater branchiopod biology. Over the years she has gained valuable experience with local, state and federal government projects. She has provided biological documentation, Section 7 consultation, and directed special-status species surveys for various private, county, state and federal clients including the San Francisco Public Utilities Commission, San Mateo County Public Works, the Federal Emergency Management Agency, Lawrence Livermore National Laboratory/University of California, California Energy Commission, Caltrans, Contra Costa County Public Works, and the City of Hercules.

Examples of projects she has participated in include endangered species recovery actions, habitat enhancement efforts, habitat management plans, numerous road construction and realignment projects, flood control projects, construction monitoring, long-term mitigation and monitoring for a dam project, hydroelectric facility recertification, timber harvest projects, natural community conservation planning, and numerous small development projects. Her involvement with these projects included performing habitat assessments, preparing Biological Assessments and Natural Environment Studies, GIS/GPS habitat mapping, mitigation site analysis, surveys and/or trapping for San Francisco garter snake, Alameda whipsnake, California red-legged frog, foothill yellow-legged frog, California tiger salamander, fairy shrimp, tadpole shrimp, western pond turtle, numerous raptors, bats, small mammals, and fish. She has also prepared habitat assessments, biology sections for CEQA and NEPA documents, and managed formal Section 7 consultation with NMFs and USFWS regarding salmonids, spotted owls, and other federally listed species.

EDUCATION University of California, Davis
B.S., Environmental Planning and Management, 1990
California State University, Hayward
Biology, graduate coursework complete, 1996-1998

EXPERIENCE

- **Principal**, Condor Country Consulting, Martinez, CA (07/01-Present)
Responsible for all aspects of a biological consulting business. Projects include managing large-scale biology surveys, monitoring, and mitigation projects. She has worked on projects with foothill yellow-legged frog, fairy shrimp, California red-legged frogs, San Joaquin kit fox, burrowing owls, California tiger salamander, small and large mammals, fish, Swainson's hawk, California and Northern spotted owl, Alameda Whipsnake and San Francisco garter snake. She is USFWS permitted for work with California red-legged frog, California tiger salamander, listed branchiopods, Alameda Whipsnake, and San Francisco garter snake.
- **Project Biologist**, Impact Sciences, Oakland, CA (06/00-06/01)
Responsible for preparation of numerous CEQA documents for a wide variety of projects across northern and southern California. Directed habitat assessments and special status species surveys. Biological work within California included work pertaining to the following species: California red-legged frog, western spadefoot, California tiger salamander, Tehachapi slender salamander, yellow-blotched salamander, San Joaquin pocket mouse, vernal pool tadpole shrimp, and several species of fairy shrimp.
- **Wildlife Biologist**, MSE Group, Oakland, CA. (01/00 - 05/00)

Condor Country Consulting, Inc.
411 Ferry St. Suite 6, Martinez, CA 94553-1145
E-mail: wendy@condorcountry.com

- 1 -

Office (925) 335-9308

Fax (925) 231-0371

<http://www.condorcountry.com>



Wendy Dexter
President/Principal Biologist

Responsible for supervision and coordination of biological monitoring activities for the BART extension to the San Francisco International Airport on the West of Bayshore property. Supervised six biologists in providing monitoring for various construction activities. Coordinated with several levels of environmental compliance monitors, the US Fish and Wildlife Service representative, and the California Department of Fish and Game representative. Monitored construction activities for compliance with the biological opinion and other inter-agency agreements. Trapped work areas for San Francisco garter snakes. Captured and relocated California red-legged frogs and other animals in harm's way.

- **Wildlife Biologist**, URS Greiner Woodward Clyde, Oakland, CA. (10/97-01/00)
Responsible for preparing documents and permits for varied projects requiring NEPA and CEQA compliance. These include biological assessments, natural environment studies, and mitigation plans. Practiced in compliance with the Federal and California Endangered Species Acts, the Migratory Bird Treaty Act, and other regulations relevant to the protection of biotic resources. Consulted with federal and state wildlife agencies on two FEMA projects in Mendocino County.
- **Research Assistant**, California State University, Hayward, Foundation. (2/96-6/98)
- **Teaching Assistant**, California State University, Hayward. (9/96-6/98)
- **Wildlife Biologist**, Jones and Stokes Associates, Sacramento, CA. (11/94-10/98)
- **Field Biologist**, North State Resources, Redding, CA. (6/94-11/94)
- **Field Biologist**, Beak Consultants, Kirkland, WA. (6/93-8/93)
- **Wildlife Biology Technician**, U.S.D.A. Forest Service, El Dorado National Forest, Amador Ranger District, Pioneer, CA. (4/90-11/93)

SPECIAL STATUS SPECIES PERMITS

U.S. Fish and Wildlife 10(a)(1)(A) Permit for San Francisco garter snake, California tiger salamander, all listed Branchiopods in California, California red-legged frog, and Alameda Whipsnake.

California Department of Fish and Game Scientific Collecting Permit and MOU for San Francisco garter snake, Alameda Whipsnake, California tiger salamander, and California red-legged frog work under federal permit.

PROFESSIONAL MEMBERSHIPS

- The Wildlife Society, Western Section
- Society for Conservation Biology
- Society for the Study of Amphibians and Reptiles

CERTIFICATIONS/TRAINING

- Proficient use of Trimble Global Positioning System, ArcView GIS, and Microsoft Word/Excel. Comfortable with Macintosh and PC environments.
- Aerial Photograph Interpretation, 1992, USDA Forest Service, Placerville, CA.
- Wild Animal Handling and Restraint, 1991, California Dept. of Fish and Game, Sacramento, CA.
- Basic Firefighting, 1990, Sierra Community College, Placerville, CA.

Condor Country Consulting, Inc.

-2-

Office (925) 335-9308

111 Ferry St. Suite 6, Martinez, CA 94553-1143

Fax (925) 251-0571

E-mail wendy@condorcountry.com

<http://www.condorcountry.com>

EXHIBIT B

WENDY DEXTER EXPERT REPORT
ATTACHMENT B

MATERIALS RELIED ON IN FORMING EXPERT REPORT OPINIONS

- Wade Fox Field Notes and journals, San Mateo County.
- U.S. Fish and Wildlife Service. 2006. San Francisco Garter Snake (*Thamnophis sirtalis tetrataenia*). 5-Year Review: Summary and Evaluation, Sacramento Field Office, Sacramento, CA. (Plaintiffs' Preliminary Injunction Ex. ("Pl. PI Ex.") 20) (DE 55)
- 2008 Swaim report for SFGS/CRLF at Sharp Park and Mori Point (attached)
- 2008 Swaim report for SFGS/CRLF at Sharp Park and Mori Point (Pl. PI Ex. 22) (DE 56)
- Compiled take evidence of CRLF and SFGS at Sharp Park
- U.S. Fish and Wildlife Service. 2002. Recovery plan for the California red-legged frog (*Rana aurora draytonii*). Region 1, Portland, Oregon, USA.
- SFGS Recovery Plan
- McGinnis Geomatrix study 1986
- McGinnis Mori Point study 1988
- Barry Mori Point Report, 1978
- Rossman, D. A., N. B. Ford, and R. A. Seigel. 1996. The garter snakes, evolution and ecology. University of Oklahoma Press, Norman, Oklahoma, USA.
- background information on www.Californiaherps.com
- Youtube.com videos of snakes run over by lawnmowers
- Storer, T. L. 1925. A synopsis of the amphibia of California. University of California Press, Berkeley, California, USA.
- Final Draft Endangered Species Compliance Plan for SFGS (CCSF 4590-4608)
- Comments on Alternatives Reports from Wild Equity Institute and Peter Baye
- Conceptual Ecosystem Restoration Plan and Feasibility Assessment (attached)
- Antworth, L. R., D. A. Pike, and E. E. Stevens. 2005. Hit and Run: Effects of scavenging on estimates of roadkilled vertebrates. *Southeastern Naturalist* 4(4): 647-656.
- DeGregorio, B. A., T. E. Hancock, D. J. Kurz, and S. Yue. 2011. How Quickly are Road-Killed Snakes Scavenged? Implications for Underestimates of Road Mortality. *Journal of the North Carolina Academy of Science* 172: 184-188.
- Larsen, S. S. 1994. Life history aspects of the San Francisco garter snake at the Millbrae habitat site. Master's Thesis. California State University, Hayward, California (attached)
- Swaim, K. SFGS Improvement Project At Mori Point, Pacifica, Cal. (CCSF89390-443)
- Sept. 27, 2011 email from Christina Crooker to Brent Plater and Darren Fong re SFGS sightings at Mori Point (attached)
- excerpts of Dec. 15, 2011 deposition of Wayne Kappelman (pp. 51-56)
- excerpts of Jan. 9, 2011 deposition of Lisa Wayne
- Email From Karen Swaim to Peebles Corp.
- Email from Christina Cooker to Darren Fong
- Federal Emergency Management Agency (FEMA), 1987, Flood Insurance Study, Pacifica, California, San Mateo County, community number 060323, February 19, 30p.
- Geomatrix 1987. Feasibility Study, Restoration of Coastal Embankment, Sharp Park Golf Course, Pacifica, CA. Prepared for: City and County of San Francisco, Department of Public Works, Bureau of Engineering, November, 91p.
- Swaim, K. San Francisco garter snake habitat improvement project at more point, Pacifica, California 2004 - 2008
- Faulkner History of San Francisco Golf Courses, 1979
- Natural Areas Program Draft and Final EIR and Management Plan for Sharp Park

EXHIBIT L



SAN FRANCISCO PLANNING DEPARTMENT

Preliminary Mitigated Negative Declaration

Date: **September 18, 2013; amended on January 9, 2014**
(Amendments to the PMND are shown as deletions in strikethrough; additions in double underline.)

Case No.: **2012.1427E**

Project Address: **Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project**

Project Location: Sharp Park

Project Sponsor: San Francisco Recreation and Parks Department (SFRPD)
~~Karen Mauney Brodek~~ Stacy Bradley – (415) 575-5604
~~karen.mauney-brodek@sfgov.org~~ stacy.bradley@sfgov.org

Staff Contact: Kei Zushi - (415) 575-9036
kei.zushi@sfgov.org

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

PROJECT DESCRIPTION:

The project site is located within Sharp Park in the City of Pacifica in San Mateo County. Sharp Park is a public park, approximately 417 acres in size, that is owned and operated by the City and County of San Francisco's (CCSF's) Recreation and Park Department (SFRPD). The proposed project consists of: 1) construction of a perennial pond, approximately 1,600 sf in size, located approximately 400 to 500 feet southeast of Horse Stable Pond (HSP); 2) realignment of a portion of an existing golf cart path located west of the fairway for golf course hole number 14 and east of the tee box for golf course hole number 15; 3) removal of sediment and emergent vegetation within HSP and the connecting channel that links HSP with Laguna Salada (LS); 4) construction of a maintenance walkway approximately 4.6 feet in width at the existing HSP pumphouse; 5) replacement of a wooden retaining wall near the pumphouse with a concrete retaining wall at the existing HSP pumphouse; and 6) construction of steps from the access road to the existing HSP pumphouse.

The project would be implemented in two locations, which cover a total of 35,000 noncontiguous square feet (sf) within Sharp Park. The majority of work would be located on the southwest corner of the existing golf course, near HSP. One segment of an existing golf cart path is proposed to be realigned as part of this project. This golf cart path segment is located to the northeast of LS and to the southwest of Lakeside Avenue.

The proposed project is being constructed in accordance with a Biological Opinion issued by the U.S. Fish and Wildlife Service (USFWS) and is separate and independent from the proposed Significant Natural Resource Areas Management Plan (SNRAMP), which is currently undergoing separate environmental review.

The Approval by the San Francisco Recreation and Park Commission is the Approval Action for the whole of the proposed project.

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 pages ~~108~~116 and ~~through 116~~through 127.

cc: ~~Karen Mauney Brodek~~ Stacy Bradley, Project Contact
Historic Preservation Distribution List

Distribution List
Virna Byrd, M.D.F

This space intentionally left blank.

INITIAL STUDY

Case No. 2012.1427E – Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project

TABLE OF CONTENTS

A. PROJECT DESCRIPTION.....	3
B. PROJECT SETTING.....	16
C. COMPATIBILITY WITH EXISTING ZONING AND PLANS	16
D. SUMMARY OF ENVIRONMENTAL EFFECTS.....	21
E. EVALUATION OF ENVIRONMENTAL EFFECTS	21
1. Land Use and Land Use Planning.....	21
2. Aesthetics.....	23 <u>24</u>
3. Population and Housing.....	26 <u>27</u>
4. Cultural and Paleontological Resources.....	27 <u>28</u>
5. Transportation and Circulation	33 <u>38</u>
6. Noise.....	36 <u>41</u>
7. Air Quality.....	38 <u>43</u>
8. Greenhouse Gas Emissions	47 <u>52</u>
9. Wind and Shadow	51 <u>56</u>
10. Recreation	53 <u>58</u>
11. Utilities and Service Systems.....	54 <u>59</u>
12. Public Services.....	59 <u>61</u>
13. Biological Resources.....	57 <u>63</u>
14. Geology and Soils	90 <u>97</u>
15. Hydrology and Water Quality.....	92 <u>99</u>
16. Hazards and Hazardous Materials	99 <u>107</u>
17. Mineral and Energy Resources	103 <u>111</u>
18. Agricultural and Forest Resources	104 <u>112</u>
19. Mandatory Findings of Significance	106 <u>114</u>
F. MITIGATION MEASURES.....	108 <u>116</u>
G. PUBLIC NOTICE AND COMMENT.....	115 <u>127</u>
H. DETERMINATION	117 <u>128</u>
I. INITIAL STUDY PREPARERS.....	118 <u>129</u>

LIST OF FIGURES

Figure 1. Vicinity Map	10
Figure 2. Map of Sharp Park and Golf Course	11
Figure 3. Location of Proposed Project.....	12
Figure 4. Drainage Network Map	13
Figure 5. Detail of Proposed Project near HSP	14
Figure 6. Detail of Proposed Golf Cart Path Realignment	15
Figure 7. Affected Wetlands and Waters of the U.S. near HSP	<u>8794</u>

LIST OF TABLES

Table 1. Criteria Air Pollutant Significance Thresholds	<u>4247</u>
Table 2. Project Construction Emission and Air Quality Significant Thresholds	<u>4449</u>
Table 3. GHG Reductions from the AB 32 Scoping Plan Sectors	<u>4954</u>
Table 4. Listed species that could potentially occur in the Project Area	<u>6470</u>
Table 5. Wetland Habitat Types in LS Wetland Complex	<u>7177</u>
Table 6. Permanently Affected Wetlands and Waters of the U.S.....	<u>8895</u>
Table 7. Temporarily Affected Wetlands and Waters of the U.S.	<u>8895</u>

A. PROJECT DESCRIPTION

Project Location and Site Characteristics

Sharp Park is a public park, approximately 417 acres in size, located in the City of Pacifica in San Mateo County that is owned and operated by the City and County of San Francisco's (CCSF's) Recreation and Park Department (SFRPD). It is bisected from north to south by the Pacific Coast Highway (PCH), with the project site located west of PCH. Sharp Park is bounded by the Pacific Ocean to the west. To the north and south, portions of Sharp Park are bordered by residential development. Sharp Park abuts portions of the Golden Gate National Recreation Area (GGNRA) to the south and east (see Figures 1 and 2). Sharp Park contains an 18-hole golf course, an archery range, a clubhouse, a remediated former rifle range, a parking lot, and extensive natural areas including an approximately 27-acre wetland complex consisting of Horse Stable Pond (HSP), Laguna Salada (LS), a channel and culverts that connect HSP to LS, and adjacent wetlands.

The SFRPD, as project sponsor, proposes to implement the project in two locations, which cover a total of 35,000 noncontiguous square feet (sf) within Sharp Park. The majority of work would be located on the southwest corner of the existing golf course, near HSP. One segment of an existing golf cart path is proposed to be realigned as part of this project. This golf cart path segment is located to the northeast of LS and to the southwest of Lakeside Avenue (see Figure 3).

The Sharp Park Golf Course is located within an 845-acre watershed.¹ HSP is located south of LS and consists of an open water pond and a fresh-to-brackish water wetland. It is connected to LS via an approximately 1,000-foot-long channel that was constructed to drain water from the lagoon to HSP, and together these three features form a wetland complex. In addition to water from LS, HSP receives water from Sanchez Creek from the east (see Figure 4). HSP is shallower and smaller than LS, and typical water depths range from one to three feet. Flood waters in the wetland complex are drained/removed by pumps located at the southwest corner of HSP, which pump water into the Pacific Ocean during the winter, when water levels in the pond become too high.

The LS wetland system is naturally maintained by groundwater during periods of low surface water inflow, such as during the summer. At these times, the water elevation in HSP and LS represents the groundwater table. Groundwater flow from the watershed to the ocean maintains HSP elevations above sea level. Over the course of the year, surface inflows to LS exceed groundwater inflows to LS by 600 percent. Some of the excess surface water inflow is lost to evaporation and uptake by plants, some flows as groundwater to the sea, and some is pumped to the ocean during periods of high inflow.²

There is a seawall located along the western boundary of Sharp Park. This seawall was originally constructed between 1941 and 1952 and eliminated the historic hydrologic connection between the Pacific Ocean and the wetland complex. The aforementioned pumps control water levels in HSP and may affect water levels in LS when the channel connecting the two water bodies creates a surface water connection between them. The existing pump system consists of a large pump

¹ U.S. Fish and Wildlife Service (USFWS). *In Reply Refer To: 08ESMF00-2012-F-0082-2, Formal Endangered Species Consultation on the Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project in San Mateo County, California*, October 2, 2012 ("Biological Opinion"). This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

² Kamman Hydrology & Engineering, Inc. *Report for the Hydrologic Assessment and Ecological Enhancement Feasibility Study: Laguna Salada Wetland System, Pacifica, California, Prepared For: Tetra Tech, Inc.*, March 30, 2009 ("Hydrologic Assessment"). This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

(rated 10,000 gallons per minute) and a small pump (rated 1,500 gallons per minute) located in a pumphouse with pipes built through the seawall to an outfall. Operation of the flood control pump system is necessary to manage floodwaters both on Sharp Park and adjacent properties. During normal rainfall years, floodwaters into LS back up onto the golf course.^{3,4}

Two factors adversely affect the operation of the pumps. First, pump operation is impaired by sediment buildup and vegetation growth around the pump intake structure and along the connecting channel between HSP and LS. Second, pump operation is impaired by the buildup of vegetation on the pump intake screens. In order for the pumps to function properly, the existing screens at the intake must be kept clear of vegetation buildup. The maintenance of the screens, including the removal of debris buildup, can be required as frequently as daily during the rainy season. Such maintenance often occurs while the pumps are being operated during or immediately after storm events when poor visibility, slippery conditions, and high water levels present hazards to maintenance workers. Currently, there is no safe walking and working surface, and maintenance workers have to lift a piece of chain link fence to access the screens for cleaning.⁵

In November 2008, a wetland delineation report was prepared in support of the proposed LS Wetland Restoration and Habitat Recovery Project.⁶ The study area for the wetland delineation report included HSP, LS, and areas of the Sharp Park Golf Course adjacent to the lagoon. The report concluded that a total of 27.42 acres of waters of the U.S.⁷ were delineated within the study area. Jurisdictional areas were classified into four habitat types: freshwater marsh, willow scrub, wet meadow, and unvegetated pond (open water) (see Sections E.13, Biological Resources for more information). In May 2013, another wetland delineation report was prepared by the SFRPD to evaluate wetlands located in the proposed project area that meet the California Coastal Commission (CCC)-only wetland criteria.^{8,9}

There are several special-status species¹⁰ that are known to occur on and near the project site. These species include the California red-legged frog (CRLF), San Francisco garter snake (SFGS),

³ Arup North America. *Sharp Park Sea Wall Evaluation*, February 5, 2010. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

⁴ USFWS. *Biological Opinion*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

⁵ *Ibid.*

⁶ Tetra Tech, Inc. *Jurisdictional Waters of the US and Wetland Determination Report, Laguna Salada Wetland Restoration and Habitat Recovery Project*, November 2008 ("LS Wetland Determination Report"). This report is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

⁷ Under the Federal Clean Water Act (FCWA) Sections 404 and 401, "jurisdictional wetlands and waters of the U.S." include one of the following: 1) traditional navigable waters; 2) wetlands next to traditional navigable waters; 3) nonnavigable tributaries of traditional navigable waters that are relatively permanent, where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); or 4) wetlands that directly abut the tributaries described in Item 3), above. See Section E.13, Biological Resources, for more information about the definition of "jurisdictional wetlands and waters of the U.S."

⁸ San Francisco Recreation and Park Department (SFRPD). *Single Parameter Wetland Delineation for the Sharp Park Pumphouse Safety, Infrastructure Improvement and Habitat Enhancement Project*, May 7, 2013 ("Single Parameter Wetland Delineation Report"). This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

⁹ See the discussion concerning the California Coastal Act under Section C, Compatibility with Existing Zoning and Plans, page 19, for the definition of CCC-only wetlands.

¹⁰ See Section E.13, Biological Resources, for the definition of "Special-Status Species."

western pond turtle (WPT), salt marsh common yellowthroat, black-crowned night heron, and San Francisco dusky-footed woodrat. CRLF is listed as “threatened” under the Federal Endangered Species Act (FESA) and a California Species of Special Concern (SSC).^{11,12} SFGS is listed as “endangered” under the FESA and classified as “endangered” and “fully protected” under the California Fish and Game Code.^{13,14,15,16,17} The black-crowned night heron is a California Special Animal.¹⁸ WPT, salt marsh common yellowthroat, and San Francisco dusky-footed woodrat are listed as a California SSC. The San Francisco dusky-footed woodrat is known to occur on the east side of PCH (see Section E.13, Biological Resources for more information).

Proposed Project

The proposed project includes elements that are required under a Biological Opinion issued by the U.S. Fish and Wildlife Service (USFWS)¹⁹ and consists of: 1) construction of a perennial pond approximately 1,600 sf in size; 2) realignment of a portion of an existing golf cart path located west of the fairway for golf course hole number 14 and east of the tee box for golf course hole number 15; 3) removal of sediment and emergent vegetation within HSP and the connecting channel that links HSP with LS; 4) construction of a maintenance walkway approximately 4.6 feet in width; 5) replacement of a wooden retaining wall near the pumphouse with a concrete retaining wall; and 6) construction of steps from the access road to the existing HSP pumphouse (see Figures 5 and 6).

¹¹ The Federal Endangered Species Act (FESA) defines “Threatened Species” as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

¹² A Species of Special Concern (SSC) is a species, subspecies, or distinct population of an animal (fish, amphibian, reptile, bird, and mammal) native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria:

- is extirpated from the State or, in the case of birds, in its primary seasonal or breeding role;
- is listed as Federally-, but not State-, threatened or endangered; meets the State definition of threatened or endangered but has not formally been listed;
- is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status;
- has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for State threatened or endangered status.

¹³ The FESA defines “Endangered Species” as any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of the FESA would present an overwhelming and overriding risk to man.

¹⁴ The California Fish and Game Code defines “Endangered Species” as a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease. Any species determined by the Fish and Game Commission as “endangered” on or before January 1, 1985, is an “endangered species.”

¹⁵ The classification of “Fully Protected” was the State’s initial effort in the 1960’s to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, mammals, amphibians and reptiles, birds and mammals. Most fully protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations.

¹⁶ California Department of Fish and Wildlife (CDFW). *Fully Protected Animals*. Available online at: http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/fully_pro.html. Accessed July 19, 2013.

¹⁷ CDFW. *State and Federally Listed Endangered & Threatened Animals of California*, January 2013. Available online at: <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEAnimals.pdf>. Accessed July 19, 2013.

¹⁸ “Special Animals” is a general term that refers to all of the taxa the California Natural Diversity Database (CNDDB) is interested in tracking, regardless of their legal or protection status.

¹⁹ USFWS. *Biological Opinion*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

The primary purposes of the proposed construction of a pond, golf cart path realignment, and sediment and vegetation removal are to: 1) restore habitat in several locations within the wetland complex for CRLF and SFGS; and 2) remove impediments to water flow within the wetland complex. The primary purposes of the proposed improvements to the pumphouse are to: 1) enhance access to the pump intake structure and improve the safety conditions of workers operating and maintaining the pumps; and 2) enhance existing habitat for CRLF and SFGS.

The following is a description of each element of the proposed project:

- 1) **Construction of a perennial pond.** An approximately 1,600-sf perennial pond would be constructed to provide habitat for CRLF. The proposed pond would be located approximately 400 to 500 feet to the southeast of HSP within Sharp Park (see Figure 5). The SFRPD has tentatively identified two possible locations for the proposed pond. The final specific location would be determined in consultation with the USFWS. The proposed pond would be constructed by excavating up to five feet in depth in a similar manner to nearby ponds recently completed by GGNRA. Depending on the results of hydrologic surveys to be conducted as part of this project, the pond may be lined with clay bentonite to prolong water retention. The pond would be designed to capture and hold surface water runoff in the immediate vicinity of the pond and may also be fed by groundwater.

Several types of plants would be removed and others planted in and near the proposed pond. The plants to be removed would primarily include invasive species such as poison hemlock (*Conium maculatum*), mustard, and annual grasses; however, some areas containing common native upland species such as coyote brush (*Baccharis pilularis*) and California aster (*Symphytotrichum chiloensis*) may also be affected. The pond margins would be planted with wetland species such as common rush (*Juncus effuses*), common threesquare (*Schoenoplectus pungens*) and common silverweed (*Potentilla anserina*) which would provide suitable attachment sites for CRLF egg masses. The uplands surrounding the pond would be revegetated with the grassland-scrub mosaic species which may include coastal sagebrush (*Artemisia pycnocephala*), sticky monkey flower (*Mimulus aurantiacus*), California aster and native grass species, which would provide high quality foraging and refuge habitat for CRLF and SFGS. The SFRPD would monitor the pond for CRLF breeding success by surveying for egg masses on an annual basis and would document habitat conditions for five years following pond construction.

- 2) **Golf cart path realignment.** One segment of an existing cart path, located west of the fairway for golf course hole number 14 and east of the tee box for golf course hole number 15, frequently floods, even during drought years. This golf cart path segment is located in a low lying depression, which prevents surface water from draining into LS and causes surface water to pond on the path. This segment of the golf cart path, approximately 100 feet in length and seven feet in width, would be realigned to shift it 5 to 10 feet further away from habitat areas (see Figure 6). To maintain the natural look of the area adjacent to the cart path, the new path may be constructed using interlocking, permeable pavers.
- 3) **Removal of sediment and emergent vegetation within HSP and the connecting channel.** Sediment and emergent vegetation, including cattails (*Typha angustifolia*) and bulrush (*Scirpus americanus*), near the existing pumphouse would be removed in order to reduce obstructions to water flow into the pump intake structure and to enhance existing habitat for CRLF and SFGS (see Figure 5). HSP is approximately 5,900 sf in size, of which 2,350 sf is filled with cattails and bulrush. From this area, approximately 435 cubic yards (CYs) of sediment and emergent vegetation would be removed. The connecting channel

between HSP and LS is approximately 6,500 sf in size. This project would also remove approximately 480 CYs of sediment and emergent vegetation from the connecting channel. To facilitate the proposed sediment and emergent vegetation removal and to reduce potential impacts to CRLF, any of the following measures, or a combination of two or more of these measures, may be implemented in consultation with the USFWS: 1) lowering the water level of HSP and the connecting channel through the use of the existing pumps; 2) installing temporary barricades within the connecting channel to prevent the water from flowing into the work areas, or 3) utilizing suction hydraulic equipment to minimize the disturbance of sediments in the water.

The sediment and vegetation removal around the pumphouse would likely require establishing an equipment access route through the jurisdictional wetland on the north side of HSP. A compact multi-purpose aquatic vessel (i.e., an Aquamog) equipped with a long boom and clam shell or bucket type attachment that can reach sediment and vegetation may be used near the pumphouse. If it is determined in consultation with regulatory agencies that it is preferable to remove water from the work area around the pumphouse prior to sediment removal, then a small bobcat or similar equipment on tracks may be used to remove sediment. It is anticipated that an excavator or Grade-all stationed on the golf course would be used for the proposed sediment and emergent vegetation removal in the connecting channel.

Sediment and vegetation removed from both HSP and the connecting channel would be placed in an elevated dewatering container located in an adjacent cleared upland area or placed directly into a dump truck and transported to the former rifle range in the Upper Canyon of Sharp Park on the east side of PCH. The sediment and vegetation would be spread over flat grassland areas in the former rifle range. No dewatering vehicles or containers would be left overnight within work areas.

- 4) **Construction of a maintenance walkway.** The proposed maintenance walkway would be approximately 4.6 feet in width and wrap around the pump intake structure, and would be constructed in compliance with the California Uniform Building Code. The maintenance walkway would be made of wood and supported by approximately six concrete support structures to be placed in jurisdictional wetlands. The support structures for the proposed maintenance walkway would result in 1.2 CYs of fill in jurisdictional wetlands and waters of the U.S., which would require a permit from the U.S. Army Corps of Engineers (USACE). A new concrete slab (5 feet by 5 feet) and metal guardrail (3.5 feet in height and 3 feet in length) may be installed at the entrance door to the pumphouse. In addition, a secondary, metal debris screen would be installed at the pump intake structure in consultation with the USFWS. This screen would be metal mesh with holes measuring approximately one inch by one half inch.
- 5) **Replacement of an existing wooden retaining wall.** An existing wooden retaining wall located next to the pumphouse, approximately 12 feet in length and 3 feet in height, would be replaced with a new concrete retaining wall of the same size, in order to prevent upland soil from entering the water. The proposed retaining wall would be constructed in compliance with the California Uniform Building Code. The proposed retaining wall would result in 0.4 CYs of fill in jurisdictional wetlands and waters of the U.S., which would require a permit from the USACE (see Figure 5).
- 6) **Construction of steps.** The proposed project includes construction of 12 steps, approximately 3 feet in width and 14.3 feet in length, leading down the slope from the access road to the existing pumphouse. The proposed steps would be constructed in compliance with the California Uniform Building Code.

The proposed project would result in excavation up to a maximum of five feet below ground surface (bgs). Best Management Practices (BMPs) for erosion control would be implemented for all elements of the proposed project and may include placement of fiber rolls, silt fences, straw blankets, hydroseeding, and straw mulch/wood chips. In addition, the SFRPD would implement the following BMPs to control the spread of mosquito-borne disease as part of this project (see Impact HZ-2 for more information):

1. Educate staff about the most effective ways to avoid being bitten by mosquitoes;
2. Remove small water features that contain standing water or treat those features with *Bacillus thuringiensis israelis* a biological control agent for mosquito larvae, if the features were to remain and Public Health Services were to identify a potential health hazard; and
3. Encourage staff to drain any standing water in stored equipment or temporary depressions.

While the proposed activities associated with sediment and vegetation removal in HSP and the connecting channel and the native plant restoration associated with the construction of the pond are similar to those identified as long-term management goals in the SFRPD's proposed 2006 Significant Natural Resource Areas Management Plan (SNRAMP), this project is a separate and independent project to improve the habitat of the CRLF and SFGS in compliance with the USFWS Biological Opinion while improving the safety of workers who maintain the pumphouse. The proposed 2006 SNRAMP, which is currently undergoing environmental review, is a management plan intended to guide SFRPD's natural resource protection, habitat restoration, trail and access improvements, and maintenance activities over time and concerns all of the identified "natural areas" within the SFRPD's jurisdiction.

Although a neighborhood notice distributed on January 15, 2013 for the proposed project indicated that the project would include restoration of a half-acre upland habitat around the wetland complex, the Planning Department has since determined that the upland habitat restoration is separate, and has independent utility, from the proposed project. The upland habitat restoration, to remove invasive plant species and revegetate with native species on a total of 0.5 acres of upland area within Sharp Park, neither relies upon nor requires the approval of the proposed project. A Categorical Exemption (Planning Case No. 2013.1008E) was issued on August 5, 2013 concerning the upland habitat restoration pursuant to the California Environmental Quality Act (CEQA). The notice also indicated that two cart paths would be realigned. The SFRPD has decided to leave the southern cart segment in its current location and manually route carts onto the fairway as needed to avoid flooded areas.

A Biological Assessment²⁰ was prepared by the SFRPD and a Biological Opinion²¹ was issued by the USFWS for the proposed project. At the request of the USFWS, the Biological Assessment and Biological Opinion included the proposed project listed above, as well as the ongoing operations and maintenance of the golf course.²² Although ongoing golf course operations, such as pump

²⁰ SFRPD. *Biological Assessment, Sharp Park Safety, Infrastructure Improvement and Habitat Enhancement Project*, May 2, 2012 ("Biological Assessment"). This Biological Assessment was amended on August 16, 2012. These documents are available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

²¹ USFWS. *Biological Opinion*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

²² The proposed project is part of the project for which the Biological Opinion was issued by the USFWS. The proposed project, except for the construction of a 1,600-sf pond, is outlined under "Construction Action" on pages 5 and 6 of the

management and operation, mowing, and golf cart use, are discussed in the Biological Opinion, these ongoing operations and maintenance activities are not considered part of the proposed project for purposes of this CEQA analysis, but rather are considered part of the existing, or baseline, conditions. No changes to golf course operations and maintenance, including operations of the pumps, are proposed as part of this project.

Construction activities are required to be undertaken between June 1 and October 31 to minimize the proposed project's impact to CRLF and SFGS in accordance with the Biological Opinion. Construction is anticipated to occur for approximately 60 days over 18 months in the appropriate construction window in accordance with the Biological Opinion. Workers for the proposed project would include up to three to ten SFRPD employees and contractors.

The Biological Opinion includes a number of Conservation Measures and Terms and Conditions, intended to minimize the project's impacts to CRLF and SFGS. These Conservation Measures and Terms and Conditions are included as mitigation measures for this project (see Section E.13, Biological Resources for more information).

Project Approvals Required

The proposed project would require the following project approvals, with the Approval by the San Francisco Recreation and Park Commission identified as the Approval Action for the whole of the proposed project:

- Approval by the San Francisco Recreation and Park Commission
- FESA Section 7 formal consultation, Biological Opinion, and Incidental Take Statement Approval by the USFWS²³
- California Endangered Species Act (CESA) consultation with the California Department of Fish and Wildlife (CDFW)²⁴ concerning fully protected species (i.e., SFGS)
- Federal Clean Water Act (FCWA) Section 404 Approval by the USACE
- FCWA Section 401 Water Quality Certification Approval by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB)
- Fish and Game Code Section 1602 Lake or Streambed Alteration Agreement Approval by the CDFW
- Coastal Development Permit Approval by the CCC

In addition, the proposed project may require the following project approval:

- ~~Approval of an amended~~ National Pollution Discharge Elimination System (NPDES) Permit by SFBRWQCB

Biological Opinion. The proposed construction of a 1,600-sf pond is outlined under "Conservation Measures for Golf Course Maintenance and Operations" on page 19 of the Biological Opinion.

²³ A Biological Opinion including an Incidental Take Statement has been issued by the USFWS for the proposed project.

²⁴ Formerly known as the California Department of Fish and Game (CDFG)

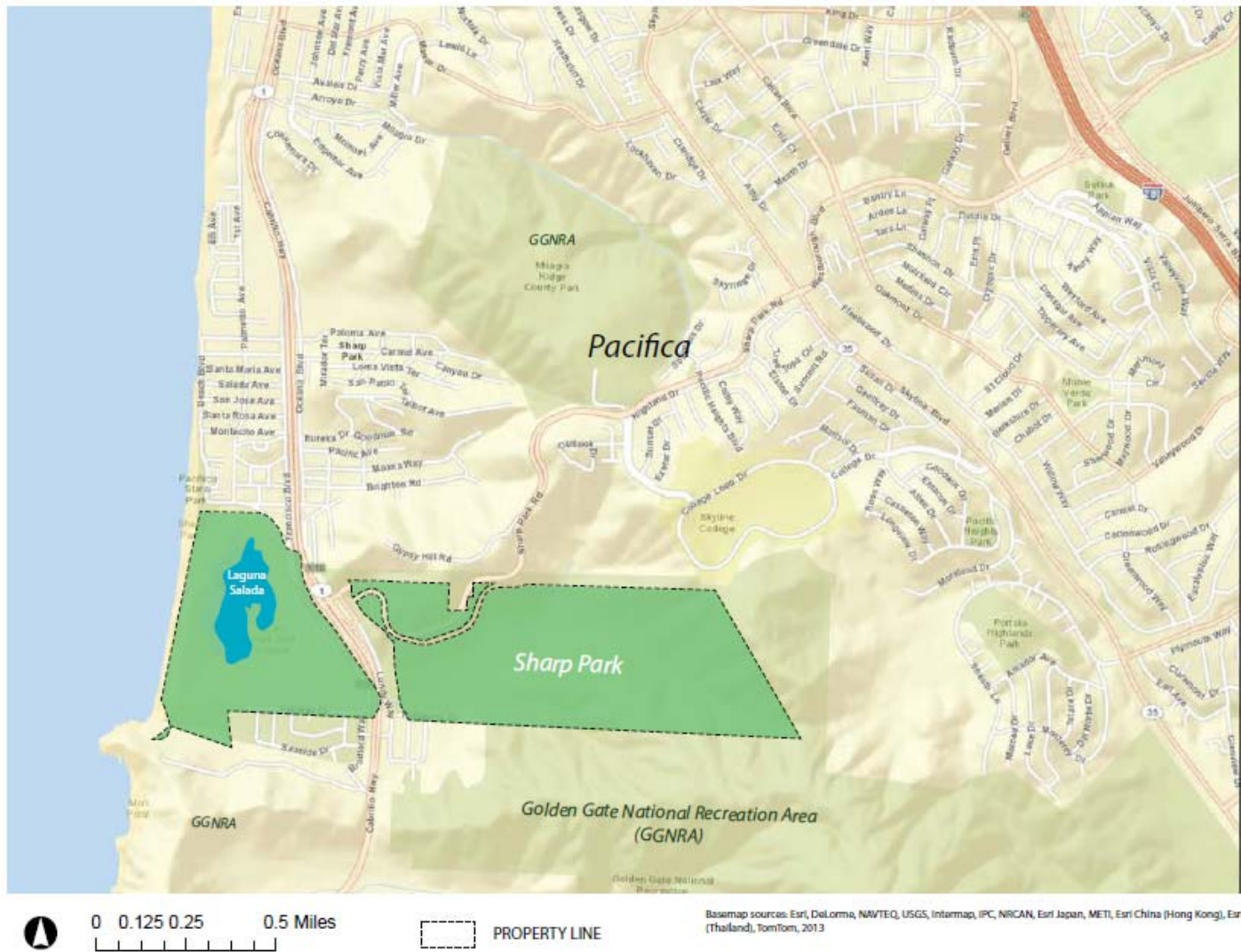


Figure 1. Vicinity Map
Source: San Francisco Recreation and Park Department



Figure 2. Map of Sharp Park and Golf Course
 Source: San Francisco Recreation and Park Department



Figure 3. Location of Proposed Project

Source: San Francisco Recreation and Park Department

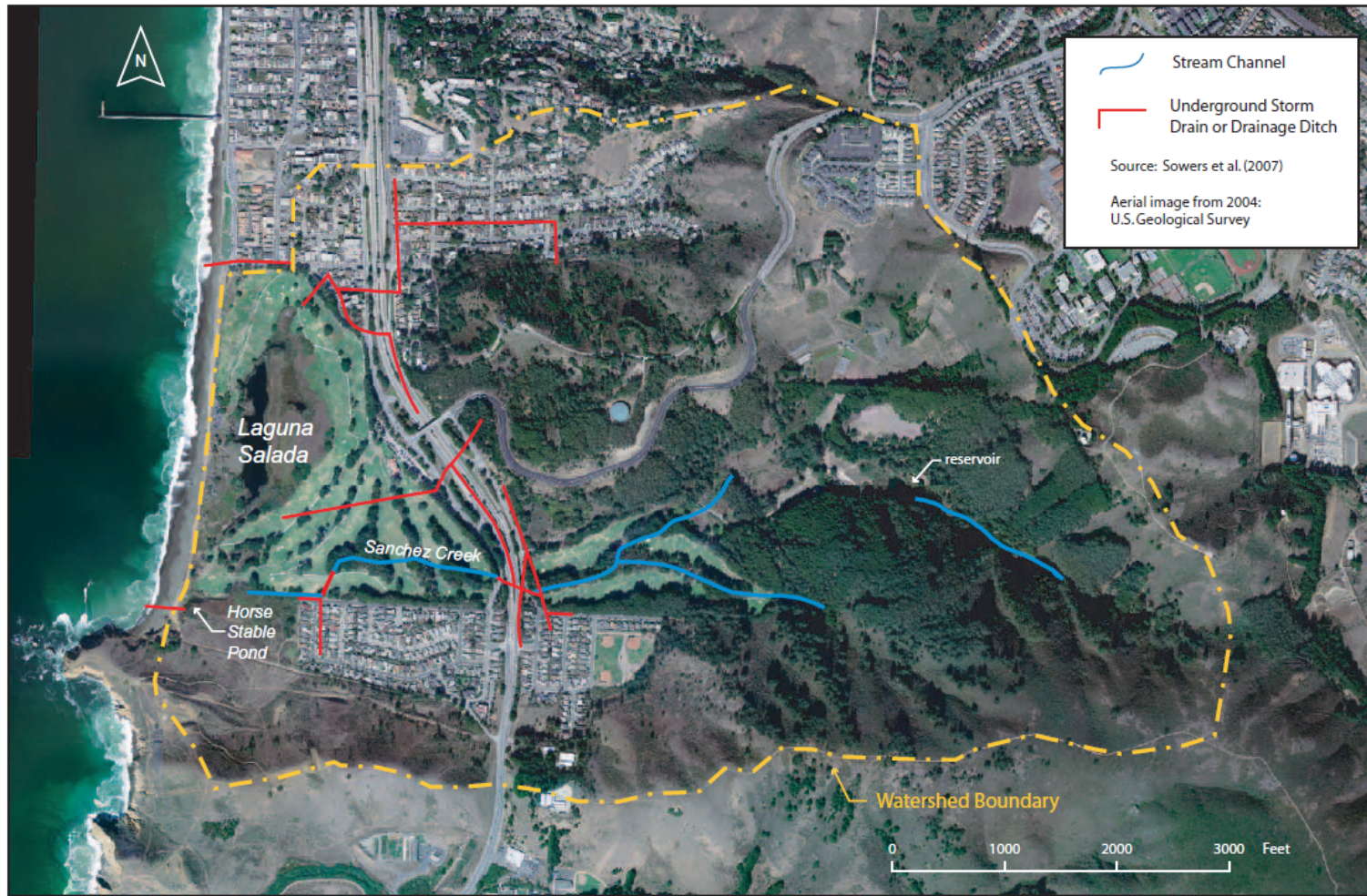


Figure 4. Drainage Network Map²⁵
Source: Kamman Hydrology & Engineering, Inc.

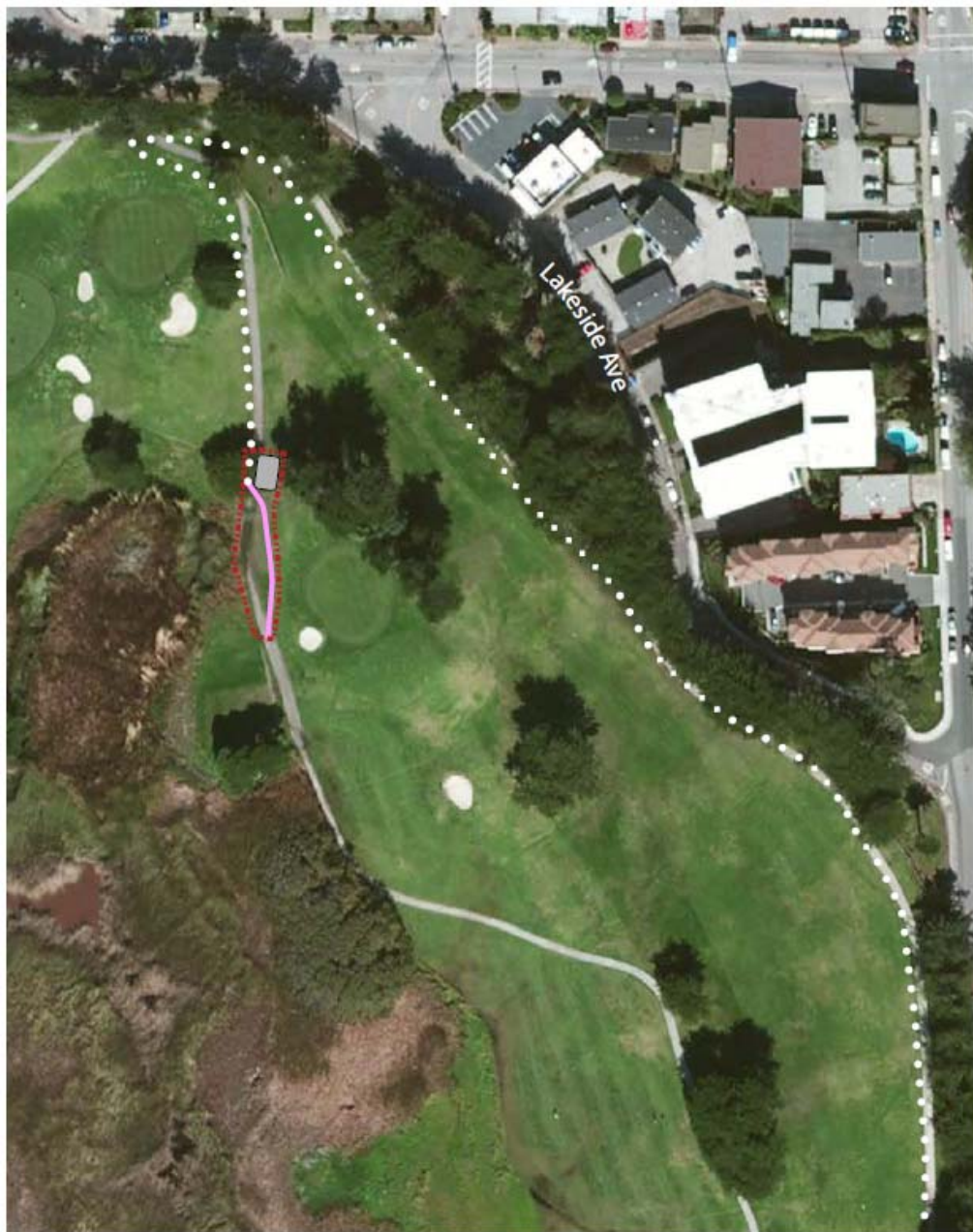
²⁵ Kamman Hydrology & Engineering, Inc. *Hydrologic Assessment*. This report is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.



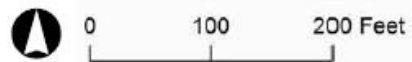
Basemap sources: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo and the GIS User Community

- ○ ○ Ingress/egress for heavy equipment
- Temporary project impact areas during construction
- - - - - Removal of sediment and emergent vegetation area
- Approximate location of heavy equipment staging during construction

Figure 5. Detail of Proposed Project near HSP
Source: San Francisco Recreation and Park Department



Basemap sources: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo and the GIS User Community



- ○ ○ Ingress/egress for heavy equipment
- Temporary project impact areas during construction
- Approximate location of heavy equipment staging during construction
- New cart path

Figure 6. Detail of Proposed Golf Cart Path Realignment
Source: San Francisco Recreation and Park Department

B. PROJECT SETTING

Sharp Park is a public park, approximately 417 acres in size, located in the City of Pacifica in San Mateo County, that is owned and operated by the SFRPD. It is bisected from north to south by the PCH, and the proposed project site is located to the west of PCH. Sharp Park is bounded by the Pacific Ocean to the west. To the north and south, portions of Sharp Park are bordered by residential development. To the south and east, Sharp Park abuts portions of the GGNRA. Sharp Park contains an 18-hole golf course, an archery range, a clubhouse, a remediated former rifle range, a parking lot, and extensive natural areas including an approximately 27-acre wetland complex consisting of HSP, LS, a channel and culverts that connect HSP to LS, and adjacent wetlands.

C. COMPATIBILITY WITH EXISTING ZONING AND PLANS

	<i>Applicable</i>	<i>Not Applicable</i>
Discuss any variances, special authorizations, or changes proposed to the Planning Code or Zoning Map, if applicable.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Discuss any conflicts with any adopted plans and goals of the City or Region, if applicable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Plans and Policies

San Francisco Plans and Policies

San Francisco land use plans and policies are primarily applicable to projects within the jurisdictional boundaries of San Francisco, although in some cases they may apply to projects outside San Francisco. This information is relevant to the evaluation of impacts of the proposed project with respect to specific significance criteria under CEQA that require analysis of the compatibility of a proposed project with certain aspects of local land use plans and policies.

The SFRPD is guided by the San Francisco City Charter along with other applicable city codes, plans, and policies. These plans include the San Francisco General Plan, which sets forth the comprehensive, long-term land use policy for CCSF, and the San Francisco Sustainability Plan, which addresses the long-term sustainability of CCSF. The plans and policies applicable to the proposed project, as well as other relevant plans and policies, are discussed herein.

This section discusses the project's inconsistencies, if any, with applicable plans and policies that may result in physical environmental effects. If no inconsistencies are identified, the discussion lists the plans that were reviewed and states that no inconsistencies were identified.

Policy conflicts do not, in and of themselves, indicate a significant environmental effect within the meaning of CEQA, in that the intent of CEQA is to determine physical effects associated with a project. Many of the plans of CCSF and the other relevant jurisdictions contain policies that address multiple goals pertaining to different resource areas. To the extent that physical environmental impacts of a proposed project may result from conflicts with one of the goals related to a specific resource topic, such impacts are analyzed in this Initial Study in that respective topic section, such as Section E.7, Air Quality, and Section E.13, Biological Resources.

San Francisco General Plan

Although the General Plan was developed for lands within the jurisdictional boundaries of CCSF, its underlying goals apply to CCSF projects outside the boundaries of CCSF. The San Francisco General Plan provides general policies and objectives to guide land use decisions. The General Plan contains 10 elements (Commerce and Industry, Recreation and Open Space, Housing, Community Facilities, Urban Design, Environmental Protection, Transportation, Air Quality, Community Safety, and Arts) that set forth goals, policies, and objectives for the physical development of San Francisco. The compatibility of the proposed project with General Plan goals, policies, and objectives that do not relate to physical environmental issues will be considered by decision-makers as part of their decision whether to approve or disapprove the proposed project. No inconsistencies with the *San Francisco General Plan* were identified.

Proposition M – 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 eight Priority Policies. These policies, and the subsection of Section E of this Initial Study addressing the environmental issues associated with the policies, are: (1) preservation and enhancement of neighborhood-serving retail uses; (2) protection of neighborhood character (Topic 1, Land Use and Land Use Planning, Question 1c); (3) preservation and enhancement of affordable housing (Topic 3, Population and Housing, Question 3b, with regard to housing supply and displacement issues); (4) discouragement of commuter automobiles (Topic 5, Transportation and Circulation, Questions 5a, 5b, and 5f); (5) protection of industrial and service land uses from commercial office development and enhancement of resident employment and business ownership (Topic 1, Land Use and Land Use Planning, Question 1c); (6) maximization of earthquake preparedness (Topic 14, Geology and Soils, Question 14a through 14d); (7) landmark and historic building preservation (Topic 4, Cultural Resources, Question 4a); and (8) protection of open space (Topic 9, Wind and Shadow, Questions 9a and 9b; and Topic 10, Recreation, Questions 10a and 10c).

Prior to issuing a permit for any project which requires an Initial Study under the CEQA, prior to issuing a permit for any demolition, conversion, or change of use, and prior to taking any action that requires a finding of consistency with the General Plan, the City is required to find that the proposed project or legislation would be consistent with the Priority Policies. As noted above, the consistency of the proposed project with the environmental topics associated with the Priority Policies is discussed in Section E, Evaluation of Environmental Effects, of this Initial Study, providing information for use in the approval for the proposed project.

No inconsistencies with the General Plan Priority Policies were identified.

1995/2006 Significant Natural Resource Areas Management Plans

On January 19, 1995, the San Francisco Recreation and Park Commission approved the first SNRAMP. While San Francisco is by and large a densely developed urban area, fragments of unique plant and animal habitats, known as Significant Natural Resource Areas (“Natural Areas”), have been preserved within the parks of San Francisco and Pacifica that are managed by the SFRPD. The SNRAMP was developed to preserve, restore, and enhance the remnant Natural Areas and to promote environmental stewardship of these areas.

The proposed project is consistent with the adopted 1995 SNRAMP as it conforms with three of the overall Program Objectives: 1) determine management needs for natural resources, particularly those identified by other agencies as rare, threatened or endangered; 2) consult and coordinate with other city departments, agencies and groups with special expertise for implementation strategies; and 3) implement measures designed to address immediate problems. The proposed project was created in consultation with the USFWS, USACE and CDFW to protect

CRLF and SFGS while also implementing measures to improve the safety of workers around the pumphouse.

The project is also consistent with the following 1995 SNRAMP's General Policies and Management Actions listed under Vegetation, Wildlife, and Water Resources: 1) vegetation, by promoting indigenous plant species around the new pond, enhancing riparian areas in HSP and the connecting channel and preserving habitat which supports wildlife; 2) wildlife, by consulting with agencies such as the USFWS, USACE, and CDFW on habitat enhancement for CRLF and SFGS; 3) water resources, by maintaining and improving the water quality of the connecting channel and HSP and protecting this riparian zone from sedimentation. As such, this project is consistent with the 1995 SNRAMP.

Over the course of several years, the SFRPD updated and expanded the level of detail in the 1995 SNRAMP, ultimately resulting in a new SNRAMP, with a final draft plan published in February 2006. The San Francisco Recreation and Park Commission approved the final draft plan for CEQA evaluation in August 2006. The proposed 2006 SNRAMP contains detailed information on the biology, geology, and trails within 32 Natural Areas, 31 in San Francisco and one (Sharp Park) in Pacifica. The proposed 2006 SNRAMP is currently undergoing environmental review. A draft Environmental Impact Report ("Draft EIR") was published on August 31, 2011, and the Planning Department is currently preparing responses to comments received on the Draft EIR.

Sustainability Plan for San Francisco

The Sustainability Plan for San Francisco was endorsed by the San Francisco Board of Supervisors in 1997. Although the Board has not committed 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 should they be proposed for implementation. The underlying goals of the plan 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, 10 that 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), and five that are broader in scope and cover many issues (Economy and Economic Development; Environmental Justice; Municipal Expenditures; Public Information and Education; and Risk Management). Each topic area in the plan has a set of indicators that are to be used over time to determine whether San Francisco is moving in a sustainable direction in that particular area. The Biodiversity section, which includes 39 specific actions, addresses the goals of increased ecological understanding, protection, and restoration of remnant natural ecosystems; increased habitat value in developed and naturalistic areas; and collection, organization, and development of historic information on habitat and biodiversity.

The Sustainability Plan for San Francisco was developed to address San Francisco's long-term environmental sustainability, and it includes many of the goals and objectives of the 1995 SNRAMP. No inconsistencies with the Sustainability Plan for San Francisco were identified.

Regional Plans and Policies

San Francisco Bay Basin (Region 2) Water Quality Control Plan

The San Francisco Bay Basin (Region 2) Water Quality Control Plan contains water quality regulations adopted by the SFBRWQCB. It has been approved by the California State Water Resources Control Board, the Office of Administrative Law, and the U.S. Environmental

Protection Agency (USEPA).²⁶ It also contains statewide regulations adopted by the California Water Resources Control Board and other state agencies that refer to activities regulated by the board. No inconsistencies with the San Francisco Bay Basin (Region 2) Water Quality Control Plan were identified.

If the preferred method for sediment and emergent vegetation removal involves pumping water from HSP to lower the water level, the SFRPD would seek ~~modification of the existing~~ Section 401 and NPDES permits to be issued by the SFBRWQCB, as required by the SFBRWQCB. No inconsistencies with the San Francisco Bay Basin (Region 2) Water Quality Control Plan were identified.

Other Regional Plans and Policies

The five principal regional planning agencies and their policy documents that guide planning in the nine-county Bay Area are the Plan Bay Area,²⁷ the Bay Area Air Quality Management District's (BAAQMD's) 2010 Clean Air Plan, the Metropolitan Transportation Commission's (MTC's) Regional Transportation Plan – Transportation 2035, the SFBRWQCB's San Francisco Basin Plan, and the San Francisco Bay Conservation and Development Commission's (BCDC's) San Francisco Bay Plan. Due to the scope and nature of the proposed project, there would be no anticipated conflicts with regional plans.

California Coastal Act

The California Coastal Act (CCA) applies to development occurring in the coastal zone. The act limits development in wetlands and coastal waters to certain types of projects (restoration projects, for example, are included among the list of permitted projects) and stipulates criteria under which such projects may be permitted. Under the CCC's regulations, an area may be classified as a wetland ("CCA-only wetland") if it meets one or more of the three parameters required that define wetlands under Section 404 of the FCWA: hydric soils, hydrophytic vegetation, or wetland hydrology. A portion of Sharp Park near the LS wetland complex is in the Coastal Zone under the CCC jurisdiction.²⁸ The majority of the project activities would take place entirely within the CCC jurisdiction and require a coastal development permit from the CCC. The final location of the proposed pond would be determined in consultation with the CCC.

The CCA includes specific policies that address issues such as public access and recreation, lower cost visitor accommodations, terrestrial and marine habitat protection, visual resources, landform alteration, agricultural lands, commercial fisheries, industrial uses, water quality, offshore oil and gas development, transportation, development design, power plants, ports, and public works. The policies of the CCA are the statutory standards that apply to planning and regulatory decisions made by the CCC and by local governments pursuant to the CCA. The CCA's policies are implemented in part through local coastal programs, which include local government land use plans, zoning codes, and other implementing plans and ordinances.

²⁶ San Francisco Bay Regional Water Quality Control Board (SFBRWQCB). *Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin*. Available online at: http://www.waterboards.ca.gov/rwqcb2/basin_planning.shtml. Accessed May 16, 2013.

²⁷ Scott Edmondson, San Francisco Planning Department. *Email to Kei Zushi, San Francisco Planning Department, ABAG projections 2009*, July 23, 2013. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

²⁸ Darryl Rance, California Coastal Commission (CCC). *Memorandum sent to John R. Bock, Tetra Tech, Boundary Determination No. 08-2011, Sharp Park Restoration Plan, San Mateo County*, May 31, 2011. This memorandum is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

No inconsistencies with the CCA were identified (see Section E.1, Land Use and Land Use Planning for more information).

CRLF Recovery Plan

The Recovery Plan for CRLF²⁹ approved by the USFWS notes that the objective of the Recovery Plan is to delist CRLF. The Recovery Plan further states that the strategy for recovery of CRLF will involve: 1) protecting existing populations by reducing threats; 2) restoring and creating habitat that will be protected and managed in perpetuity; 3) surveying and monitoring populations and conducting research on the biology of and threats to the subspecies; and 4) reestablishing populations of the subspecies within its historic range. No inconsistencies with the Recovery Plan for CLRF were identified.

City of Pacifica Plans and Policies

Although the SFRPD and the proposed project in Sharp Park are not subject to City of Pacifica land use ordinances, plans, and policies, the following discussion is presented for informational purposes.

City of Pacifica Local Coastal Land Use Plan

The City of Pacifica's Local Coastal Land Use Plan (LUP) serves as the land use plan for the City of Pacifica's coastal zone and was written in accordance with the policies of the CCA. The LUP was adopted in 1980, and is undergoing an update. The LUP includes 33 Coastal Act policies, most of which are applicable to particular General Plan elements. The policies cover such topics as access, facilities, recreation, habitat protection, scenic and visual qualities, and cultural resources. No inconsistencies with the LUP were identified.

The majority of the project activities would take place entirely within the CCC jurisdiction and require a coastal development permit from the CCC. The final location of the proposed pond would be determined in consultation with the CCC.

Neighborhood Notification

A "Notification of Project Receiving Environmental Review" was sent out on January 15, 2013, to the owners of properties within 300 feet of the Sharp Park boundaries and to occupants of properties adjacent to the project site, as well as to other interested parties. The Planning Department received several letters in response to the notice. Respondents requested to receive environmental review documents and/or expressed concerns regarding the proposed project, which included: (1) impacts to CRLF and SFGS; (2) impacts to other special-status species and wetland habitats; and 3) historic resource impacts. These issues are addressed in the appropriate topic areas in Section E, Evaluation of Environmental Effects.

²⁹ USFWS, Region 1. *Recovery Plan for the California Red-legged Frog, (Rana aurora draytonii)*. Approved May 28, 2002. Available online at: <http://www.amphibians.org/wp-content/uploads/2013/07/California-Red-legged-Frog-Recovery-Plan.pdf>. Accessed December 17, 2013.

D. SUMMARY OF ENVIRONMENTAL EFFECTS

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

- | | | |
|---|--|--|
| <input type="checkbox"/> Land Use | <input checked="" type="checkbox"/> Air Quality | <input type="checkbox"/> Geology and Soils |
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Wind and Shadow | <input checked="" type="checkbox"/> Hydrology and Water Quality |
| <input type="checkbox"/> Population and Housing | <input type="checkbox"/> Recreation | <input type="checkbox"/> Hazards/Hazardous Materials |
| <input checked="" type="checkbox"/> Cultural and Paleo. Resources | <input type="checkbox"/> Utilities and Service Systems | <input type="checkbox"/> Mineral/Energy Resources |
| <input type="checkbox"/> Transportation and Circulation | <input type="checkbox"/> Public Services | <input type="checkbox"/> Agricultural Resources |
| <input type="checkbox"/> Noise | <input checked="" type="checkbox"/> Biological Resources | <input checked="" type="checkbox"/> Mandatory Findings of Significance |

This Initial Study examines the proposed project to identify potential effects on the environment. For each item on the Initial Study Checklist, the evaluation has considered the impacts of the proposed project both individually and cumulatively. All items on the Initial Study 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 has determined that the proposed project could not have a significant adverse environmental effect relating to that issue. A discussion is included for those items checked "Less than Significant with Mitigation Incorporated" and "Less than Significant Impact" and for most items checked "No Impact" or "Not Applicable." For all of the items checked "No Impact" or "Not Applicable" without discussion, the conclusions regarding potential significant adverse environmental effects are based upon field observation, staff experience and expertise on similar projects, and/or standard reference material available within the Planning Department, such as the Department's Transportation Impact Analysis Guidelines for Environmental Review, or the California Natural Diversity Database (CNDDDB) and maps, published by the CDFW. The environmental topics checked above have been determined to be "Less than Significant with Mitigation Incorporated."

E. EVALUATION OF ENVIRONMENTAL EFFECTS

<u>Topics:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporated</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>	<u>Not Applicable</u>
1. LAND USE AND LAND USE PLANNING—					
Would the project:					
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial impact upon the existing character of the vicinity?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

Implementation of the proposed project would occur entirely within the boundaries of Sharp Park (see Figure 3), which is an existing recreation facility that includes a golf course and open space. There is no existing established community within Sharp Park. Although the proposed construction of a perennial pond would result in the conversion of a portion of Sharp Park to open water wetland habitat for CRLF and SFGS, (see Figure 5), the proposed project would not include construction of any features that would divide Sharp Park or any existing community. None of the proposed project activities would alter the overall existing land use of the project site or vicinity, and the project site would remain as a public park, with a golf course and open space, upon completion of construction activities. Therefore, the proposed project would have no impact with respect to the physical division of an established community.

Impact LU-2: The proposed project would be consistent with the 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. (Less than Significant)

Land use regulations applicable to the project include the CCSF General Plan and CCA. As discussed in Section C, Compatibility with Existing Zoning and Plans, the project would not conflict with the General Plan. In addition, the proposed project is not subject to the City of Pacifica or San Mateo County plans and policies.

In Section C, Compatibility with Existing Zoning and Plans, the CCA is discussed and the City of Pacifica Local Coastal LUP is addressed for informational purposes. The primary objective of the CCA is the protection of wetlands and other environmentally sensitive habitats, water quality, public access and recreation, low cost visitor facilities, and the scenic and visual qualities of coastal areas and the control of coastal erosion and other hazards.^{30,31}

The proposed project would not restrict access to or within Sharp Park and would not affect low cost visitor facilities. As discussed in Section E.2, Aesthetics, none of the project elements would result in a significant impact to the visual quality of the nearby coastal areas. The proposed project would involve improvements to an existing pumphouse and habitat for CRLF and SFGS. The project would be subject to various mitigation measures to protect wetlands and other environmentally sensitive habits and water quality and minimize soil erosion and other hazards that could result from the proposed project (see Sections E.13, Biological Resources, E.14, Geology and Soils, E.15, Hydrology and Water Quality, and E.16, Hazards and Hazardous Materials, for more information).

A portion of Sharp Park near the LS wetland complex is in the Coastal Zone under the CCC jurisdiction.³² The majority of the project activities would take place entirely within the CCC jurisdiction and require a coastal development permit from the CCC. The final location of the proposed pond would be determined in consultation with the CCC. Development within the coastal zone may not commence until a coastal development permit has been issued by the CCC.

³⁰ CCC. *Program Overview*. Available online at: <http://www.coastal.ca.gov/whoweare.html>. Accessed July 19, 2013.

³¹ CCC. *Laws, Regulations, and Legislative Information*. Available online at: <http://www.coastal.ca.gov/ccatc.html>. Accessed July 19, 2013.

³² Darryl Rance, CCC. *Memorandum sent to John R. Bock, Tetra Tech, Boundary Determination No. 08-2011, Sharp Park Restoration Plan, San Mateo County*, May 31, 2011. This memorandum is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

Through its review of the coastal development permit, the CCC would ensure that the project would be consistent with the applicable provisions of the CCA.

In light of the above, the proposed project would be consistent with the San Francisco General Plan and CCA on balance, and therefore this impact is less than significant.

Impact LU-3: The proposed project would not have a substantial impact upon the existing character of the vicinity. (Less than Significant)

Sharp Park is an existing park, which includes a golf course and open space, including wetland habitat areas. It is bisected from north to south by PCH. To the north and south, portions of Sharp Park are bordered by residential development. Sharp Park is bounded by the Pacific Ocean to the west. The Mori Point GGNRA property borders the southwestern edge, and the Sweeney Ridge GGNRA property borders Sharp Park on the southeastern and eastern edges. The project site is primarily surrounded by open space and wetland habitat areas.

The proposed project would entail improvements to existing facilities and habitat areas within Sharp Park. The proposed improvements to the existing pumphouse and golf cart path realignment would be minor in scope, and would not alter the overall character of Sharp Park or its vicinity. The proposed project includes removal of emergent vegetation (cattails and bulrush) in HSP and the connecting channel to enhance habitat and establish native vegetation. This work would result in a reduction in the amount of vegetation in HSP and the connecting channel and could be noticeable to park visitors, but would not have a substantial impact on the existing character of Sharp Park. The proposed construction of a perennial pond would result in the conversion of a portion of Sharp Park to open water wetland habitat for CRLF and SFGS. The pond and associated wetland features would be aesthetically compatible with the existing character of the area. Project activities would not include construction of any features that would substantially affect the existing character of Sharp Park and its vicinity and Sharp Park would continue to be used as a park.

In light of the above, the proposed project would not result in any changes to the project site that could have a substantial impact on the character of Sharp Park or its vicinity, and this impact is less than significant.

Impact C-LU: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not make a considerable contribution to any cumulative significant land use impacts. (Less than Significant)

As of September 2013, there are no known past or present projects in the project vicinity that would interact with the proposed project to result in cumulative significant land use impacts. The Draft EIR prepared for the proposed 2006 SNRAMP, a reasonably foreseeable future project in the proposed project's vicinity, concluded that the proposed 2006 SNRAMP would not result in any significant land use impacts. A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the environment, including land use impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.³³ Thus, no cumulative impact to land use within the project site vicinity exists to which this project could potentially contribute.

³³ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

Moreover, the proposed project would not divide any existing community, conflict with plans and policies established for protecting the environment, or affect the existing land use characteristics of Sharp Park or its surroundings. Therefore, the proposed project would not contribute to a cumulative impact on land use and land use planning, even if one existed.

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
2. AESTHETICS—Would the project:					
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

A visual quality analysis is somewhat subjective and considers the proposed project in relation to the surrounding visual character, heights and building types of surrounding uses, the project’s potential to obstruct public scenic views, and its potential to create light and glare. A proposed project would have a substantial effect on the visual landscape if it were to cause a substantial demonstrable adverse change to the aesthetic value of the project site or its surroundings.

The intensity of the impact depends, in part, on viewers and their sensitivity to changes to scenic resources at the project site and its surroundings. Residents, for example, are normally sensitive to changes in their surroundings, as are those recreating. However, roadway travelers might not be as sensitive because changes to the environment are only viewed for a short period of time.

Sharp Park is bordered by the Pacific Ocean to the west and bisected by PCH. LS, HSP, and most of the Sharp Park Golf Course are on the western side of PCH; an archery range, the remaining golf course holes, and extensive canyon are on the eastern side. Sanchez Creek originates in the Upper Canyon of Sharp Park and approximately bisects the park in an east-west direction. Sharp Park is surrounded by open spaces, including Mori Point and Sweeney Ridge. The vegetation of Sharp Park is dominated by non-native (eucalyptus) forest and a golf course, but also contains areas with wetlands and scrub vegetation. Views of the project site are limited to the seawall, golf course, and GGNRA properties.

The proposed project does not include outdoor or indoor lighting or other components that would create new sources of light or glare. In addition, nighttime construction lighting would not be required because construction would be conducted between 7:00 a.m. and 5:00 p.m. Therefore, the project would result in no impact with respect to light and glare, and Question 2d is not discussed further.

Impact AE-1: The proposed project would not have a substantial adverse effect on scenic views and vistas. (Less than Significant)

A project would have a significant effect on scenic vistas if it would substantially degrade important public view corridors or obstruct scenic views from public areas viewable by a substantial number of people. View corridors are defined by physical elements such as buildings and structures that direct lines of sight and control view directions available to the public. The project site is adjacent to a golf course and open space, and therefore, no particular view corridors exist at or near the project site. Scenic views and vistas in the project site vicinity are limited to the seawall, golf course, and GGNRA properties.

The proposed project includes construction of steps and a maintenance walkway and replacement of an existing retaining wall around the existing pumphouse at HSP. These proposed structures would be constructed at locations lower in elevation than the existing nearby trails or access roads. In addition, these changes to the pumphouse are insignificant in scale and character and would not obstruct or restrict existing scenic views. Therefore, the proposed improvements would generally be unnoticeable to park visitors following project completion. The realigned golf cart path would be constructed at grade level and would not obstruct or restrict any scenic vistas. The proposed construction of a perennial pond would result in the conversion of a portion of Sharp Park to open water wetland habitat for CRLF and SFGS. The pond would be aesthetically compatible with the existing character of the areas and would not result in degradation of scenic views of the areas.

In summary, none of the proposed structures or other project improvements would substantially change existing scenic views and vistas. In light of the above, the proposed project's impact with respect to scenic views and vistas is less than significant.

Impact AE-2: The proposed project would not substantially damage any scenic resources. (Less than Significant)

Scenic resources are the visible physical features on a landscape (e.g., land, water, vegetation, animals, structures, and other features.) Changes to specific scenic resources of concern, such as vegetation, are described below. An existing access road located on top of the seawall, through which the primary project access would be provided, is not a designated scenic roadway.

While the visual setting of the project area would be temporarily altered by the presence of construction equipment such as a backhoe, Aquamog, long-arm excavator, and trucks, construction-related impacts would be short term and temporary and would not result in long-term adverse impacts to the scenic resources of the project area or Sharp Park as a whole.

Given the minor scope of the proposed project, scenic resources would not be substantially affected by the proposed project. The proposed changes to the pumphouse and golf cart path would be virtually unnoticeable to those recreating on publicly accessible areas including the seawall, Mori Point, and the golf course. Changes to HSP and the connecting channel resulting from the emergent vegetation (cattails and bulrush) removal would include diminished vegetation cover and may be noticeable to visitors. Over time, the progression of natural processes would reduce these impacts, and given the relatively minor scale of the vegetation removal work, this would not result in a significant impact to scenic resources. The proposed pond would blend in with the surrounding areas which are characterized by open space, shrubs, and wetland features.

In light of the above, the proposed project's impact to scenic resources is less than significant.

Impact AE-3: The proposed project would result in a change to the existing character of the project site, but this change would not degrade the visual character or quality of the site and its surroundings. (Less than Significant)

During the proposed project construction, equipment such as a backhoe, Aquamog, long-arm excavator, and trucks would be visible. The presence of construction equipment and construction activities would temporarily detract from the overall visual quality of the area. Less visible equipment would also be part of project construction and include, for example, workers weeding and constructing the proposed structures. Construction is anticipated to occur for approximately 60 days over 18 months in the appropriate construction window in accordance with the Biological Opinion. While the equipment and project activities would temporarily detract from the overall visual quality of the areas, the equipment and these types of activities are temporary and not considered completely out of place or new to Sharp Park because maintenance activities similar to those involved in the proposed project have been conducted on a regular basis. Therefore, there would be less-than-significant impacts on the visual character or quality of the area from the proposed construction.

The proposed project includes construction of steps and a maintenance walkway and replacement of an existing retaining wall around the pumphouse at HSP. These changes to the pumphouse would not constitute a substantial change in scale and character of the pumphouse. The proposed construction of a perennial pond would result in the conversion of a portion of Sharp Park to open water wetland habitat for CRLF and SFGS. The pond and associated wetland features would be aesthetically compatible with the existing character of the area and would not result in degradation of the visual character or quality of the areas.

In summary, although the project would result in small changes to the existing character of the project site, the project would not degrade the visual character or quality of the site and its surroundings. Therefore, this impact is less than significant.

Impact C-AE: The proposed project, in combination with past, present, and reasonably foreseeable future development in the site vicinity, would not make a considerable contribution to any cumulative significant aesthetics impacts. (Less than Significant)

The geographic context for the analysis of visual resources consists of Sharp Park and the immediate surroundings. As of September 2013, there are no known past or present projects in the project vicinity that would, in combination of the proposed project, result in cumulative significant aesthetics impacts. The Draft EIR prepared for the proposed 2006 SNRAMP, a reasonably foreseeable future project in the proposed project's vicinity, concluded that the proposed 2006 SNRAMP would not result in a significant impact with respect to aesthetics. A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the environment, including aesthetics impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.³⁴ Thus, no cumulative aesthetics impact within the project vicinity exists to which this project could potentially contribute.

The proposed project would not substantially affect the visual character or quality of Sharp Park or its surroundings. The proposed project would not substantially damage any scenic resources. Therefore, the proposed project would not contribute to a cumulative impact on aesthetics.

³⁴ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

<u>Topics:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporated</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>	<u>Not Applicable</u>
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Displace substantial numbers of existing housing units or create demand for additional housing, necessitating the construction of replacement housing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The proposed project involves improvements to existing facilities and creation of habitat for CRLF and SFGS. It would not displace any residential uses, thus Question 3c is not applicable.

Impact PH-1: The proposed project would not induce population growth on the project site or in its vicinity, either directly or indirectly. (Less than Significant)

The proposed project would not entail construction of new residences or businesses, and therefore would not result in any direct impacts related to growth inducement. Workers for the proposed project include up to three to ten individuals, including SFRPD employees and contractors. The proposed project would not be likely to attract new employees to San Francisco because the project only involves minor construction work, which typically does not provide wages high enough to induce relocation. Even if all of these individuals were to move to the San Francisco Bay Area for this project, the increase in the population would be considered insignificant compared to the overall population of the San Francisco Bay Area. Therefore, the project would not induce substantial population growth or create significant demand for additional housing, and this impact is less than significant.

Impact PH-2: The proposed project would not displace existing housing units, or substantial numbers of people, or create demand for replacement housing. (No Impact)

The proposed project would not result in the displacement of any housing units or residents. Therefore, the proposed project would not create demand for replacement housing and no impact with respect to the displacement of housing units or people would result from the proposed project.

Impact C-PH: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not make a considerable contribution to any cumulative significant population and housing impacts. (Less than Significant)

As of September 2013, there are no known past or present projects in the project vicinity that would, in combination of the proposed project, result in cumulative significant population or housing impacts. The Initial Study prepared for the proposed 2006 SNRAMP concluded that the proposed 2006 SNRAMP would not result in any significant impacts with respect to population or housing. A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the environment, including population impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.³⁵ Thus, no cumulative impact to population or housing within the project vicinity exists to which this project could potentially contribute.

The proposed project would not induce any population growth, nor have significant physical environmental effects on population or housing demand. Therefore, the proposed project would not contribute to a cumulative impact on population and housing, even if one existed.

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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Historic Resources

As part of the analysis conducted to prepare the Draft EIR for the proposed 2006 SNRAMP, an historical resources evaluation (HRE) of the Sharp Park Golf Course and an Historic Resource Evaluation Response (HRER) for Sharp Park were completed.^{36,37} In addition, an HRER has been

³⁵ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

³⁶ Tetra Tech, Inc. *Historical Resources Evaluation Report for the Sharp Park Golf Course, Part of the Natural Areas, City and County of San Francisco, Pacifica, San Mateo County*, January 2011. This report is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

prepared by the Planning Department for the proposed project.³⁸ Sharp Park is not listed on the state or national registries. The property is considered a “Category A” (Known Historic Resource) property for the purposes of the Planning Department’s CEQA review based upon the previous reviews cited above.

Under CEQA, a property qualifies as a historic resource if it is “listed in, or determined to be eligible for listing in, the California Register of Historical Resources.” To be a historical resource for the purpose of CEQA, a property must not only be shown to be significant under the California Register of Historical Resources criteria, but it must also retain historic integrity.³⁹

The HRER prepared for this project found that Sharp Park appears eligible for listing on the California Register as a historic landscape for its significance under Criteria 1 (Events) and 3 (Architecture). The golf course’s development is associated with the broader events of the golden age of golf in the U.S. and California. The course is also an important example of a seaside golf course designed by a master landscape architect, Alister Mackenzie.

The HRER for the proposed project states that the character-defining features of the property include:

- The original features and design of the clubhouse;
- The original features and design of the permanent maintenance building; and
- The original features and design of the golf course, including the 12 original holes (current holes 1, 2, 3, 8, 9, 10, 11, 13, 14, 15, 17, and 18), the original landscape features, and the cypress tree plantings that line the fairways.

Archeological Resources

As part of the analysis conducted to prepare the Draft EIR for the proposed 2006 SNRAMP, records searches were completed in June and October 2008 from the California Historical Resources Information System’s Northwest Information Center (NWIC) at Sonoma State University (File Nos. 07-1792 and 08-0414).

Impact CP-1: The proposed project would not result in a substantial adverse change in the significance of historical architectural resources, including the Sharp Park historic landscape. (Less than Significant)

The HRER prepared for this project concluded that the proposed project would not result in any significant impacts to historic resources, and is summarized below. Furthermore, the work would comply with the Secretary of the Interior Standards for the Treatment of Historic Properties and the Guidelines for Rehabilitating Cultural Landscapes.

³⁷ Shelley Caltagirone, San Francisco Planning Department. *Historic Resource Evaluation Response (HRER), Significant Natural Resource Areas Management Plan: Sharp Park Golf Course, Pacifica*, February 15, 2011. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

³⁸ Shelley Caltagirone, San Francisco Planning Department. *Historic Resource Evaluation Response (HRER), Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project*, February 12, 2013. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

³⁹ “Integrity” is defined as “the authenticity of a property’s historic identity, evidenced by the survival of physical characteristics that existed during the property’s period of significance.” Historic integrity enables a property to illustrate significant aspects of its past.

The proposed improvements to the HSP pumphouse would not significantly alter the overall form of the pumphouse structure or affect the historic setting or character of Sharp Park. The existing pumphouse is not considered to be an historic character-defining feature. In addition, the proposed changes would maintain the existing character and the setting of hole number 12, which is an altered but contributing feature of the historic landscape.

The proposed perennial pond would be located to the southeast of HSP, along the southern edge of Sharp Park. This periphery location would ensure the preservation of the Sharp Park setting. The proposed pond would be in keeping with the existing character of the wetland area in this location. While the proposed project would involve the removal of emergent vegetation in the wetland complex areas, it would not result in disturbance to any historically significant plantings (i.e., the cypress tree plantings that line the fairways).

The existing circulation pattern of the course would remain essentially unchanged, except that one segment of an existing golf cart path, which is not a character-defining feature of the site, would be slightly re-routed near the tee box for hole number 15. Hole number 15 is a contributing feature of the historic landscape. However, this change would not significantly alter the character of a historic fairway or hole as it would only shift the path 5 to 10 feet east of its current location, essentially maintaining the existing route. In addition, this change would not result in removal of any historically significant material.

In light of the above, the proposed project would not result in a significant impact to historical resources.

Impact CP-2: The proposed project ~~would~~ result in damage to, or destruction of, as-yet unknown archeological remains, should such remains ~~exist beneath the~~ be present within soils affected by activities resulting from the proposed project site. (Less than Significant with Mitigation)

When determining the potential for encountering archeological resources, relevant factors include the location, depth, and the extent of excavation proposed, as well as any recorded information on known resources in the area. An Environmental Planning Preliminary Archeological Review (PAR): Checklist has been prepared by the Planning Department's archeologist for the proposed project and is summarized below.

The PAR Checklist notes that there is no previous archeological documentation for the project site and that it is unknown to what extent grading or re-contouring has historically occurred within the project area or to what extent the current landscape is the result of human modifications as no geological or geotechnical studies were available for the review of this project.

The Sharp Park area is sensitive for prehistoric resources. A number of prehistoric shell midden sites (CA-SMA-162, CA-SMA-268, S-31602 and C-116) have been recorded/documented. CA-SMA-268 is a prehistoric shell midden settlement site that contained artifactual material, including obsidian projectile points, a groundstone pestle, chert debitage, and fire-cracked rock along Calera Creek to the southeast of the project site. There is a limestone quarry site near the coastal shoreline southwest of HSP. The limestone quarry was quarried by Mission neophytes working at the Mission Dolores asistencia of San Pedro y San Pablo to the east for whitewash and plaster for adobe structures at the asistencia, Mission Dolores and the Presidio de San Francisco. Ethnohistorically, the Aramai village of Timigtac is thought to have been located at Mori Point. CA-SFR-162, a prehistoric shell midden deposit is located just to the southwest of HSP. CA-SFR-162 may be a redeposited shell midden deposit. Finally, to the west of the

proposed project site is a recorded historical archeological feature associated with the Sharp Park Temporary Detention Station/Sharp Park State Relief Camp (1930s-1946).

~~Based on the above, the PAR Checklist concluded that the proposed project could have significant effects on archeological resources given the location of the project and the depth of excavation resulting from the project, which would be a maximum of five feet below ground surface (bgs), and that Although the proposed project is expected to result in shallow sub-grade effects (three feet below ground surface (bgs) within wetland deposits and five feet bgs within non-wetland deposits) the project's ecological setting and the general sensitivity of the project vicinity for prehistoric sites create a reasonable concern that otherwise undocumented prehistoric deposits could be affected by the proposed project. Although the shallowness of the potential project effects renders the potential to affect prehistoric deposits low to moderate, mitigation of this potential by accidental discovery or archeological consultant monitoring requirements may not be sufficient if any prehistoric shell midden deposit has been stained as a result of organic or iron-sulfide processes. Implementation of Mitigation Measure M-CP-2 requiring archeological testing below would reduce the potential impacts of the proposed project to adversely affect archeological resources to a less-than-significant level.~~

Mitigation Measure M-CP-2 - ~~Accidental Discovery~~ Archeological Testing

~~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; or to any project subcontractor (including demolition, excavation, grading, etc. firms) 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 and subcontractor(s)) 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 an archaeological consultant from the pool of qualified archaeological consultants maintained by the Planning Department archaeologist. 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 archaeological 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 describes 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 Archaeological 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 EP division of the Planning Department shall receive one bound copy, one unbound copy and one unlocked, searchable PDF copy on CD 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.~~

Based on a reasonable presumption that archeological resources may be present within the project site, the following measures shall be undertaken to avoid any potentially significant adverse effect from the proposed project on buried or submerged historical resources. The project sponsor shall retain the services of an archaeological consultant from the rotational Department Qualified Archaeological Consultants List (QACL) maintained by the Planning Department archaeologist. The project sponsor shall contact the Department archaeologist to obtain the names and contact information for the next three archeological consultants on the QACL. The archeological consultant shall undertake an archeological testing program as specified herein. In addition, the consultant shall be available to conduct an archeological monitoring and/or data recovery program if required pursuant to this measure. The archeological consultant's work shall be conducted in accordance with this measure at the direction of the Environmental Review Officer (ERO). All plans and reports prepared by the consultant as specified herein shall be submitted first and directly to the ERO for review and comment, and shall be considered draft reports subject to revision until final approval by the ERO. Archeological monitoring and/or data recovery programs required by this measure could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of construction can be extended beyond four weeks only if such a suspension is the only feasible means to reduce to a less than significant level potential effects on a significant archeological resource as defined in CEQA Guidelines Sect. 15064.5 (a)(c).

Consultation with Descendant Communities: On discovery of an archeological site⁴⁰ associated with descendant Native Americans, the Overseas Chinese, or other descendant group an appropriate representative⁴¹ of the descendant group and the ERO shall be contacted. The representative of the descendant group shall be given the opportunity to monitor

⁴⁰ By the term "archeological site" is intended here to minimally included any archeological deposit, feature, burial, or evidence of burial.

⁴¹ An "appropriate representative" of the descendant group is here defined to mean, in the case of Native Americans, any individual listed in the current Native American Contact List for the City and County of San Francisco maintained by the California Native American Heritage Commission and in the case of the Overseas Chinese, the Chinese Historical Society of America. An appropriate representative of other descendant groups should be determined in consultation with the Department archeologist.

archeological field investigations of the site and to consult with ERO regarding appropriate archeological treatment of the site, of recovered data from the site, and, if applicable, any interpretative treatment of the associated archeological site. A copy of the Final Archaeological Resources Report shall be provided to the representative of the descendant group.

Archeological Testing Program. The archeological consultant shall prepare and submit to the ERO for review and approval an archeological testing plan (ATP). The archeological testing program shall be conducted in accordance with the approved ATP. The ATP shall identify the property types of the expected archeological resource(s) that potentially could be adversely affected by the proposed project, the testing method to be used, and the locations recommended for testing. The purpose of the archeological testing program will be to determine to the extent possible the presence or absence of archeological resources and to identify and to evaluate whether any archeological resource encountered on the site constitutes an historical resource under CEQA.

At the completion of the archeological testing program, the archeological consultant shall submit a written report of the findings to the ERO. If based on the archeological testing program the archeological consultant finds that significant archeological resources may be present, the ERO in consultation with the archeological consultant shall determine if additional measures are warranted. Additional measures that may be undertaken include additional archeological testing, archeological monitoring, and/or an archeological data recovery program. No archeological data recovery shall be undertaken without the prior approval of the ERO or the Planning Department archeologist. If the ERO determines that a significant archeological resource is present and that the resource could be adversely affected by the proposed project, at the discretion of the project sponsor either:

- A) The proposed project shall be re-designed so as to avoid any adverse effect on the significant archeological resource; or
- B) A data recovery program shall be implemented, unless the ERO determines that the archeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible.

Archeological Monitoring Program. If the ERO in consultation with the archeological consultant determines that an archeological monitoring program shall be implemented the archeological monitoring program shall minimally include the following provisions:

- The archeological consultant, project sponsor, and ERO shall meet and consult on the scope of the AMP reasonably prior to any project-related soils disturbing activities commencing. The ERO in consultation with the archeological consultant shall determine what project activities shall be archeologically monitored. In most cases, any soils- disturbing activities, such as demolition, foundation removal, excavation, grading, utilities installation, foundation work, driving of piles (foundation, shoring, etc.), site remediation, etc., shall require archeological monitoring because of the risk these activities pose to potential archaeological resources and to their depositional context;
- The archeological consultant shall advise all project contractors to be on the alert for evidence of the presence of the expected resource(s), of how to identify the evidence of

- the expected resource(s), and of the appropriate protocol in the event of apparent discovery of an archeological resource;
- The archeological monitor(s) shall be present on the project site according to a schedule agreed upon by the archeological consultant and the ERO until the ERO has, in consultation with project archeological consultant, determined that project construction activities could have no effects on significant archeological deposits;
 - The archeological monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material as warranted for analysis;
 - If an intact archeological deposit is encountered, all soils-disturbing activities in the vicinity of the deposit shall cease. The archeological monitor shall be empowered to temporarily redirect demolition/excavation/pile driving/construction activities and equipment until the deposit is evaluated. If in the case of pile driving activity (foundation, shoring, etc.), the archeological monitor has cause to believe that the pile driving activity may affect an archeological resource, the pile driving activity shall be terminated until an appropriate evaluation of the resource has been made in consultation with the ERO. The archeological consultant shall immediately notify the ERO of the encountered archeological deposit. The archeological consultant shall make a reasonable effort to assess the identity, integrity, and significance of the encountered archeological deposit, and present the findings of this assessment to the ERO.

Whether or not significant archeological resources are encountered, the archeological consultant shall submit a written report of the findings of the monitoring program to the ERO.

Archeological Data Recovery Program. The archeological data recovery program shall be conducted in accord with an archeological data recovery plan (ADRP). The archeological consultant, project sponsor, and ERO shall meet and consult on the scope of the ADRP prior to preparation of a draft ADRP. The archeological consultant shall submit a draft ADRP to the ERO. The ADRP shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain. That is, the ADRP will identify what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historical property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archeological resources if nondestructive methods are practical.

The scope of the ADRP shall include the following elements:

- *Field Methods and Procedures.* Descriptions of proposed field strategies, procedures, and operations.
- *Cataloguing and Laboratory Analysis.* Description of selected cataloguing system and artifact analysis procedures.
- *Discard and Deaccession Policy.* Description of and rationale for field and post-field discard and deaccession policies.
- *Interpretive Program.* Consideration of an on-site/off-site public interpretive program during the course of the archeological data recovery program.

- Security Measures. Recommended security measures to protect the archeological resource from vandalism, looting, and non-intentionally damaging activities.
- Final Report. Description of proposed report format and distribution of results.
- Curation. Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

Human Remains and Associated or Unassociated Funerary Objects. The treatment of human remains and of associated or unassociated funerary objects discovered during any soils disturbing activity shall comply with applicable State and Federal laws. This shall include immediate notification of the Coroner of the City and County of San Francisco and in the event of the Coroner's determination that the human remains are Native American remains, notification of the California State Native American Heritage Commission (NAHC) who shall appoint a Most Likely Descendant (MLD) (Pub. Res. Code Sec. 5097.98). The archeological consultant, project sponsor, and MLD shall make all reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or unassociated funerary objects (CEQA Guidelines, Sec. 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.

Final Archeological Resources Report. The archeological consultant shall submit a Draft Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archeological resource and describes the archeological and historical research methods employed in the archeological testing/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.

Once approved by the ERO, copies of the FARR shall be distributed as follows: California Archaeological 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, one unbound and one unlocked, searchable PDF copy on CD 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 in or the high interpretive value of the resource, the ERO may require a different final report content, format, and distribution than that presented above.

Impact CP-3: The proposed project would have the potential to destroy paleontological resources or other unique geological features, should such remains exist beneath the project site. (Less than Significant with Mitigation)

The proposed project would involve excavation of up to five feet bgs. It is possible that this depth may reach Pleistocene deposits that may contain paleontological resources or a unique geological formation; therefore, it is anticipated that excavation associated with the proposed project could encounter paleontological resources, potentially resulting in a significant impact. With the implementation of **Mitigation Measure M-CP-3**, as outlined below, the proposed project's impacts on paleontological resources would be less than significant.

Mitigation Measure M-CP-3 - Paleontological Training Program and Alert Sheet

To reduce the potential for the proposed project to result in a significant impact on paleontological resources, the SFRPD 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 shall also include a review of penalties for looting and disturbance of these resources. An alert sheet shall be issued 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 instruct that if a paleontological deposit is encountered within a project area, all soil-disturbing activities in the vicinity of the deposit shall cease and the ERO shall be notified immediately.
3. If an unanticipated paleontological resource is encountered during project activities, all project activities shall stop, and a professional paleontologist shall be hired to assess the potential paleontological resource and its significance. The findings shall be presented to the ERO, who shall determine the additional steps to be taken before work in the vicinity of the deposit is authorized to continue.

Impact CP-4: The proposed project could substantially disturb human remains, should such remains exist beneath the project site. (Less than Significant with Mitigation)

There is a possibility that intact burials exist within the project area footprint. Therefore, the proposed project has the potential to result in significant impacts to human remains. With the implementation of **Mitigation Measure M-CP-4** as outlined below, the proposed project's impacts to human remains would be less than significant.

Mitigation Measure M-CP-4 - Human Remains, Associated or Unassociated Funerary Objects

The treatment of human remains and of associated or unassociated funerary objects discovered during any ground-disturbing activity shall comply with applicable State and Federal Laws, including immediate notification to the San Mateo County Coroner and in the event of the Coroner's determination that the human remains are Native American remains, notification to the Native American Heritage Commission (NAHC) who shall appoint a Most Likely Descendant (MLD) (Pub. Res. Code Sec. 5097.98). The project archaeological consultant, SFRPD, and MLD shall make all reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or unassociated funerary objects (CEQA Guidelines. Sec. 15064.5(d)). The agreement should take into consideration the appropriate excavation, removal, recordation, analysis, curation, possession, and final disposition of the human remains and associated or unassociated funerary objects.

Impact C-CP: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not make a considerable contribution to any cumulative significant impacts to cultural or paleontological resources. (Less than Significant with Mitigation)

Historic Resources

Potential cumulative impacts to historic resources caused by the proposed project and the proposed 2006 SNRAMP were evaluated in the HRER⁴² prepared for this project.

At the time of writing, the Final EIR for the proposed 2006 SNRAMP has not been prepared. However, the Draft EIR for the proposed 2006 SNRAMP identified several significant historical resource impacts to the golf course at Sharp Park, which include the following:

- The closure of hole number 12 would cause a significant impact to the historic resource as the work would eliminate an original hole and fairway on the west side of the course. Its removal would significantly alter the original golf course design and boundaries.
- Modifying approximately 13 acres of the golf course to create upland habitat along the east side of the lagoon would require slightly shortening or narrowing hole numbers 10 and 13. This alteration would significantly alter the character of these original fairways. Therefore, the work would cause a significant impact to the historic resource.
- The recreation analysis of the Draft EIR prepared for the proposed 2006 SNRAMP proposes a mitigation measure (Option 1) that would create a new hole on the east side of PCH as a replacement for hole number 12. This would result in a total of 13 holes on the west side of the highway and five holes on the east side. This arrangement would not maintain the historic balance of holes on either side of the highway and would change the historic boundaries of the course. This would cause a significant impact to the original design of the historic resource.
- The recreation analysis of the Draft EIR prepared for the proposed 2006 SNRAMP proposes a mitigation measure (Option 2) that would create a new hole on the west side of PCH as a replacement for hole number 12. While the mitigation measure would change the layout of the holes, this alternative mitigation measure would restore some of the elements that Alister Mackenzie had implemented in his original design by placing the new holes in areas of the course where holes were historically placed. The proposed holes would also be in keeping with the historic boundaries of the golf course. Because of the restorative aspect of the work, this mitigation would cause a less-than-significant impact to the resource.

In summary, the proposed 2006 SNRAMP project would result in significant impacts to several character-defining features of the golf course, including hole numbers 10, 12, and 13. Because the proposed project would not cause any substantial adverse changes to the historic resource, the project would not contribute considerably to any cumulative impacts to historic resources in combination with the proposed 2006 SNRAMP project. A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the environment, including historic resources impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.⁴³

⁴² Shelley Caltagirone, San Francisco Planning Department. *Historic Resource Evaluation Response (HRER), Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project*, February 12, 2013. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

⁴³ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

Archeological and Other Cultural Resources

The Draft EIR for the proposed 2006 SNRAMP concluded that with the implementation of mitigation measures the proposed 2006 SNRAMP would not result in any significant impacts to archeological and paleontological resources and human remains that could be present within Sharp Park. A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the environment, including archeological resources and other cultural resources impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.⁴⁴

As discussed above, the proposed project would have the potential to result in significant impacts, however, **Mitigation Measures M-CP-2, M-CP-3, and M-CP-4** would reduce the project’s potential impact to archaeological resources, paleontological resources, and human remains to a less-than-significant level. Therefore, the proposed project would not contribute considerably to a cumulative impact associated with archeological resources, paleontological resources, or human remains.

<u>Topics:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporated</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>	<u>Not Applicable</u>
5. TRANSPORTATION AND CIRCULATION –					
Would the project:					
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways (unless it is practical to achieve the standard through increased use of alternative transportation modes)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

⁴⁴ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

<u>Topics:</u>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Result in inadequate parking capacity that could not be accommodated by alternative solutions?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., conflict with policies promoting bus turnouts, bicycle racks, etc.), or cause a substantial increase in transit demand which cannot be accommodated by existing or proposed transit capacity or alternative travel modes?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sharp Park is bisected from north to south by PCH (see Figure 1). Public streets located near the project site include: Francisco Boulevard; Bradford Way; Fairway Drive; an existing access road located on top of the seawall; Clarendon Road; Lakeside Avenue; and Laguna Way. The main project access would be provided via the existing access road located on top of the seawall.

The project site is not located near a public or private airport or within an airport land use plan area. Therefore, Question 5c would not apply to the proposed project.

Impact TR-1: The proposed project would not 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, nor would the proposed project conflict with an applicable congestion management program, nor would it exceed any applicable level of service standards and travel demand measures. (Less than Significant)

The proposed project would not include any activities that would conflict with any applicable transportation or congestion management plan, ordinance, or policy. While vehicles would be used during project construction, the frequency of trips by these vehicles would be minimal. Workers for the proposed project would include approximately three to ten individuals, including SFRPD employees or contractors. The increase in the traffic volume resulting from the proposed project, which would be implemented over 18 months, would be negligible compared to the overall traffic volume in the project site vicinity or the San Francisco Bay Area. With the exception of the realigned golf cart path, the majority of the proposed improvements would be conducted in publicly inaccessible areas. Therefore, it is not anticipated that the proposed improvements would attract substantially more visitors. As such, the project would not be expected to generate a substantial number of additional visitors to the project site.

The proposed project would not be expected to generate substantially more traffic over existing levels following project construction. As a result, the proposed project would not increase traffic such that the project would result in exceedance of any level of service standard, and therefore this impact is less than significant.

Impact TR-2: The proposed project would not increase hazards as a result of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses. (No Impact)

The proposed project does not include any design features that would substantially increase traffic hazards (e.g., creating a new sharp curve or dangerous intersections), and would not

include any incompatible uses, as discussed above in Section E.1, Land Use and Land Use Planning. The proposed project does not include any changes to existing roadways, and involves minor realignment of an existing golf cart path. The realigned path would be substantially similar to the existing path in terms of width, shape, and material. Therefore, there would be no impacts associated with increased traffic hazards resulting from the proposed project.

Impact TR-3: The proposed project would not result in inadequate emergency access. (No Impact)

The proposed project would be implemented within the existing boundaries of Sharp Park, and would not result in any changes in access to adjacent facilities or residences or to Sharp Park itself. Therefore, no impact on emergency access would result from the proposed project.

Impact TR-4: The proposed project would not result in inadequate parking capacity that could not be accommodated by alternative solutions (Less than Significant)

The proposed project would not involve establishment of new land uses or a change in land use that would require additional parking spaces. As mentioned in Impact TR-1, it is not anticipated that the proposed improvements would attract substantially more visitors. As such, the project would not be expected to generate substantial parking demand and this impact is less than significant.

Impact TR-5: The proposed 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 features. (Less than Significant)

The proposed project would be implemented within the existing boundaries of Sharp Park, and would not conflict with any adopted policies, plans or programs regarding public transit. Furthermore, the proposed project would not impact any bicycle or pedestrian facilities (see Figure 3). During the construction period, several equipment storage and staging areas would be established in the project area. None of these storage and staging areas would significantly affect movements of park users on the project site or the seawall. As part of the proposed project, one segment of an existing golf cart path, totaling approximately 100 feet in length, would be relocated to shift the path approximately 5 to 10 feet further away from habitat areas (see Figure 6). The golf cart path segment becomes inundated during seasonal flooding and covered with mud or grass. The proposed realignment would enhance the safety and usability of the path and this impact is less than significant. Another nearby segment of the golf cart path (to the south of the path segment proposed for realignment) floods seasonally as well. It was determined that this south segment would not be realigned as part of this project and golf carts would be manually routed around the flooded area as needed.

Impact C-TR: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not make a considerable contribution to any cumulative significant transportation impacts. (Less than Significant)

As of September 2013, there are no known past or present projects in the project vicinity that would, in combination of the proposed project, result in cumulative transportation impacts during the construction period of the proposed project. A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the

environment, including transportation impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.⁴⁵

The Initial Study prepared for the proposed 2006 SNRAMP, a reasonably foreseeable future project in the proposed project’s vicinity, concluded that the proposed 2006 SNRAMP would not result in any significant transportation impacts to which this project could potentially contribute.

The proposed project would not result in any significant project-specific impacts to transportation and circulation. The number of trips generated as a result of the proposed project would be minimal. The project would not result in any significant impacts on transit, bicycle, and pedestrian facilities. Therefore, the proposed project would not contribute to a cumulative transportation impact.

<u>Topics:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporated</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>	<u>Not Applicable</u>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Be substantially affected by existing noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

⁴⁵ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

The project site is not within an airport land use plan area, nor is it in the vicinity of a private airstrip. Therefore, Questions 6e and 6f are not applicable.

Impact NO-1: The proposed project would not result in a substantial permanent increase in ambient noise levels in the project vicinity, nor would it expose persons to noise levels and vibration in excess of standards established in the local general plan or noise ordinance. (Less than Significant)

There are no known or established noise standards applicable to the proposed project. With respect to project-generated traffic, generally, traffic must double in volume to produce a noticeable increase in average noise levels. Project-generated traffic during construction would not result in an audible change given the small scale of this project, which would involve a total of three to ten SFRPD employees and contractors. The proposed project involves improvements to existing facilities (primarily the existing pumphouse) and habitat. Once construction is complete, noise resulting from the project would be the same as under existing, or baseline, conditions. Further, the proposed project would not add any new source of permanent groundborne vibration or noise. As a result, the proposed project would not substantially increase ambient noise levels⁴⁶ or expose persons to substantial noise levels and vibration. Therefore, this impact is less than significant.

Impact NO-2: The proposed project would not result in a substantial temporary or periodic increase in ambient noise levels and vibration in the project vicinity. (Less than Significant)

During project implementation, construction equipment operation (a backhoe, Aquamog, long-arm excavator, and trucks) would temporarily increase noise levels and vibration in the project area and its vicinity, and could be considered an annoyance by occupants of nearby properties or visitors to Sharp Park. Construction noise and vibration levels would fluctuate depending on the construction phase, equipment type and duration of use, distance between noise source and receptor, and presence or absence of barriers. During construction, which is anticipated to occur for approximately 60 days over 18 months in the appropriate construction window in accordance with the Biological Opinion, there would be truck traffic to and from the site, delivering building materials and transporting material and debris removed from the project site. Potential noise impacts are expected to be discontinuous and of very short duration during the day time. Given the relatively minor scope of the proposed project, temporary and intermittent use of construction equipment would not be considered to result in substantial noise or vibration. As a result, the proposed project's impacts associated with noise and vibration would be less than significant.

Impact C-NO: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not make a considerable contribution to any cumulative significant noise impacts. (Less than Significant)

As of September 2013, there are no known past or present projects in the project vicinity that would, in combination of the proposed project, result in cumulative construction noise impacts during the construction period of the proposed project. The Initial Study prepared for the proposed 2006 SNRAMP, a reasonably foreseeable future project in the proposed project's vicinity, concluded that the proposed 2006 SNRAMP would not result in any significant impacts with respect to noise. Furthermore, the proposed project's construction activities would not overlap with those identified in the proposed 2006 SNRAMP. [A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration \(Planning Department Case No. 2013.1008E\)](#)

⁴⁶Ambient noise—the background noise in an area or environment, being a composite of sounds from many sources near and far.

concluded that the proposed restoration would not result in any significant effects on the environment, including noise impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.⁴⁷ Thus, no construction noise cumulative impact within the project vicinity exists to which this project could potentially contribute.

Even if a cumulative impact due to traffic noise were to result from future foreseeable residential and non-residential development in the vicinity, because the proposed project would not substantially increase traffic volumes, the project would not contribute considerably to any cumulative traffic-related increases in ambient noise. Therefore, the project’s cumulative noise impacts are considered less than significant.

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
7. AIR QUALITY					
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Setting

Sharp Park is located within the San Francisco Bay Area Air Basin (SFBAAB). The BAAQMD is the regional agency with jurisdiction over the nine-county 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),

⁴⁷ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

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. The most recent air quality plan, the *2010 Clean Air Plan (CAP)*, was adopted by the BAAQMD on September 15, 2010. The *2010 CAP* 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 establishes emission control measures to be adopted or implemented. The *2010 CAP* 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 proposed project consists of the following construction elements:

- Construction of steps (approximately 3 feet in width and 14.3 feet in length) from the access road to the existing HSP pumphouse;
- Construction of a maintenance walkway (approximately 4.6 feet in width);
- Replacement of a wooden retaining wall with a concrete retaining wall;
- Removal of sediment and emergent vegetation within HSP and the connecting channel that links HSP with LS;
- Construction of a perennial pond approximately 1,600 sf; and
- Realignment of a segment of the existing golf cart path.

Construction activities are required to be undertaken between June 1 and October 31 in accordance with the USFWS-issued Biological Opinion. Construction is anticipated to occur for approximately 60 days over 18 months in the appropriate construction window in accordance with the Biological Opinion. Upon completion of construction activities, short-term air pollutant emissions would cease. Ongoing maintenance activities that may result in emissions of air pollutants, including those from vehicle trips, would be substantially similar to existing levels and therefore operational air pollutant emissions would not measurably increase upon completion of the proposed project. Therefore, the following analysis focuses on construction-related air quality impacts that would result from implementation of the proposed project.

Impact AQ-1: The proposed project would not conflict with or obstruct implementation of the applicable air quality plan. (Less than Significant)

Air quality plans developed to meet federal requirements are referred to as State Implementation Plans. The CAA and CCAA require plans to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM₁₀ standard). As discussed above, on September 15, 2010, the BAAQMD, in cooperation with the Metropolitan Transportation Commission and the Association of Bay Area Governments (ABAG), adopted the *2010 Clean Air Plan (CAP)*.⁴⁸ The *2010 CAP* 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 an applicable air quality plan.

The *2010 CAP* includes stationary-source control measures to be implemented through BAAQMD regulations; mobile-source control measures to be implemented through incentive

⁴⁸ Bay Area Air Quality Management District (BAAQMD). *2010 Clean Air Plan*. Available online at: <http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Clean-Air-Plans.aspx>. Accessed December 26, 2012.

programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with the Metropolitan Transportation Commission, local governments, transit agencies, and others. The 2010 CAP represents the Bay Area's most recent triennial assessment of the region's strategy to attain the state one-hour ozone standard.

In determining whether the proposed project would conflict with the 2010 CAP, the following analysis considers the degree to which the proposed project: (1) supports the primary goals of the 2010 CAP; (2) is consistent with the 55 control measures listed in the 2010 CAP; and (3) whether the project would hinder implementation of the 2010 CAP.

The proposed project would not introduce a new land use that would induce traffic trips in numbers that would constitute a significant impact on the local roadway network, local transit lines, or local bicycle and pedestrian networks. During the project's approximately 60-day (over 18 months in accordance with the Biological Opinion) construction period, temporary and intermittent traffic impacts would result from truck movements to and from the project site. However, construction would be a temporary activity and would not result in long-term air pollutant emissions. Given the nature and relatively minor scope of the proposed project, the proposed project would be consistent with the 2010 CAP, would not conflict with the primary goals of the plan, and would not disrupt, delay, or otherwise hinder implementation of the plan. Thus, the proposed project would not conflict with or obstruct implementation of the applicable air quality plan and this impact would be less than significant.

Impact AQ-2: The proposed project would result in significant fugitive dust emissions during construction. (Less than Significant with Mitigation)

Project-related excavation, grading, and other construction activities may cause wind-blown dust that could contribute particulate matter into the local atmosphere. These emissions are termed "fugitive dust." 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. Dust can be an irritant causing watering eyes or irritation to the lungs, nose, and throat. Depending on exposure, adverse health effects can occur due to this particulate matter in general and also due to specific contaminants such as lead or asbestos that may be constituents of soil. The current health burden of particulate matter demands that, where possible, public agencies take feasible available actions to reduce sources of particulate matter exposure.

Fugitive dust emissions are typically generated during construction phases. Studies have shown that the application of BMPs at construction sites significantly control fugitive dust.⁴⁹ Individual measures have been shown to reduce fugitive dust by anywhere from 30 to 90 percent.⁵⁰ The BAAQMD recommends that construction projects within the SFBAAB employ a set of BMPs to control fugitive dust emissions during construction and considers these projects to result in less-than-significant fugitive dust impacts.⁵¹

Construction associated with improvements to the pumphouse and wetland complex could generate fugitive dust during soil-disturbing activities including soil/vegetation removal, excavation, site grading, installation of proposed structures and realignment of the golf cart path.

⁴⁹ Western Regional Air Partnership. 2006. *WRAP Fugitive Dust Handbook*. September 7, 2006. This document is available online at http://www.wrapair.org/forums/dejff/dh/content/FDHandbook_Rev_06.pdf. Accessed February 16, 2012.

⁵⁰ BAAQMD, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, October 2009, page 27.

⁵¹ BAAQMD, *CEQA Air Quality Guidelines*, May 2011.

Although the proposed project would involve mostly wet soils and earthen access routes, unmitigated, fugitive dust generated by the proposed project could result in significant air quality impacts. Under such conditions, watering active construction areas would address most impacts from fugitive dust. **Mitigation Measure M-AQ-2**, below, requires the SFRPD to incorporate the following measures to reduce constructed-related fugitive dust emissions.

Mitigation Measure M-AQ-2 - Preparation and Implementation of a Dust Control Plan

The SFRPD shall comply with the following requirements to control fugitive dust:

- The SFRPD shall designate an individual to monitor compliance with dust control requirements identified in this mitigation measure;
- Water all active construction areas sufficiently to prevent dust from becoming airborne (without creating runoff) in any area of land clearing, earth movement, excavation, and other dust-generating activity. Watering shall occur as needed, and whenever wind speeds exceed 15 miles per hour. Reclaimed water shall be used whenever possible;
- Establish shutdown conditions based on wind, soil migration, and other factors;
- Limit the area subject to construction activities at any one time;
- During excavation and dirt-moving activities, wet sweep or vacuum the routes and paths where work is in progress at the end of the workday;
- Cover any inactive (no disturbance for more than seven days) stockpiles greater than ten cubic yards or 500 square feet of excavated materials, backfill material, import material, gravel, sand, road base, and soil with a 10 mil (0.01 inch), wildlife-friendly polyethylene plastic or equivalent tarp and brace it down or use other equivalent soil stabilization techniques;
- Limit the amount of soil in hauling trucks to the size of the truck bed, and secure the load with a tarpaulin;
- Enforce a 10-mile per hour (mph) speed limit for vehicles entering and exiting construction areas;
- All soil stockpiles, if any, shall be protected against wind and rainfall erosion at all times. Wildlife-friendly plastic sheeting or other similar material shall be used to cover soils and shall be securely anchored by sandbags or other suitable means. At no time shall any stockpiled materials be allowed to erode into any water body or drainage facility or onto any roadway; and
- Install and use wheel washers to clean truck tires.

The SFRPD shall prepare and submit a site-specific Dust Control Plan to the ERO for records. The Plan shall detail a protocol for project compliance with the above requirements.

Implementation of **Mitigation Measure M-AQ-2**, above, includes the BAAQMD-recommended BMPs and additional dust control measures and would reduce construction-related fugitive dust emissions to a less-than-significant level.

Impact AQ-3: The proposed project would emit criteria air pollutants during construction, but not at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants. (Less than Significant)

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 (NO₂), sulfur dioxide (SO₂), 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. The SFBAAB is designated as either in attainment⁵² or unclassified for most criteria pollutants with the exception of ozone, PM_{2.5}, and PM₁₀,⁵³ for which these pollutants are designated as non-attainment under the state or federal standards. By its very nature, regional air pollution is largely a cumulative impact in that no single project is sufficient in size to, by itself, result in non-attainment of regional air quality standards. 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.⁵⁴

As discussed above, the proposed project would contribute to regional criteria air pollutants during construction, but would not result in a measurable increase in emissions thereafter. Table 1, below, identifies air quality significance thresholds that are the basis for determining significant air quality impacts for the proposed project, followed by a discussion of each threshold. The thresholds identified in Table 1 are based on the BAAQMD's *Revised Draft Options and Justification Report, California Environmental Quality Act Air Quality Significance Thresholds*.⁵⁵ 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 1. Criteria Air Pollutant Significance Thresholds

Pollutant	Construction Thresholds
	Average Daily Emissions (lbs./day)
ROG	54
NO _x	54
PM ₁₀	82 (exhaust)
PM _{2.5}	54 (exhaust)
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices

Ozone Precursors. As discussed above, the SFBAAB is currently designated as non-attainment for ozone and particulate matter (PM₁₀ and PM_{2.5}). 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). 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. The federal New Source Review (NSR) program was created by the federal CAA to ensure that sources of air pollution are constructed in a manner that is consistent with attainment of federal health based ambient air quality standards. Similarly, to ensure that new

⁵² "Attainment" status refers to those regions that are meeting federal and/or state standards for a specified criteria pollutant. "Non-attainment" refers to regions that do not meet 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.

⁵³ PM₁₀ is often termed "coarse" particulate matter and is made of particulates that are 10 microns in diameter or larger. PM_{2.5}, termed "fine" particulate matter, is composed of particles that are 2.5 microns or less in diameter.

⁵⁴ BAAQMD, *California Environmental Quality Act Air Quality Guidelines*, May 2011, page 2-1.

⁵⁵ BAAQMD, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, October 2009.

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 emissions level is an annual average of 10 tons per year (or 54 pounds (lbs.) per day).⁵⁶ These levels represent emissions by which sources of air pollution are not anticipated to contribute to an air quality violation or result in a considerable net increase in criteria air pollutants.

Particulate Matter (PM₁₀ and PM_{2.5}). For PM₁₀ and PM_{2.5}, the emissions limit under the federal NSR is 15 tons per year. These emissions limits represent levels at which a source is not expected to have an impact on air quality.⁵⁷ Similar to ozone precursor thresholds identified above, these thresholds can be applied to the proposed project to evaluate the impact of the project's construction emissions on regional air quality.

Impact Analysis

Construction activities would emit criteria air pollutants from the combustion of fuel used by construction equipment, construction worker vehicles, and trucks delivering and removing materials to and from the site.

An evaluation of potential air quality impacts resulting from project construction activities was prepared using the California Emissions Estimator Model™ (CalEEMod), version CalEEMod.2011.1.⁵⁸ CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for quantifying criteria air pollutant emissions from the construction and operation of land use projects. CalEEMod contains the California Air Resources Board (ARB) Mobile Vehicle Emission Inventory Program 2007 and data specific to the SFBAAB. Construction equipment assumptions were provided by the SFRPD. Where specific information was unknown, default equipment, horsepower and operating hours were used, providing a conservative (i.e., worst case) estimate of criteria air pollutants. Results of the criteria air pollutant analysis are shown below in Table 2. These results reflect criteria air pollutant emissions that would result from both the improvements at the pumphouse and within the wetland complex.⁵⁹

⁵⁶ BAAQMD, *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, October 2009, page 17.

⁵⁷ *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, October 2009, page 16.

⁵⁸ California Emissions Estimator Model (CalEEMod). Available online at: <http://www.caleemod.com/>. Accessed February 26, 2013.

⁵⁹ Detailed modeling assumptions and CalEEMod output sheets are available for public review as part of Case File No. 2012.1427E, at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, CA 94103.

Table 2. Project Construction Emission and Air Quality Significant Thresholds

Air Pollutant	Construction Emissions (lbs./day)	
	Project Emissions	Significance Threshold
Reactive organic gases (ROG)	1.9	54
Nitrogen oxides (NO _x)	11.5	54
Coarse particulate matter (PM ₁₀)	1.2 (exhaust only)	82 (exhaust only)
Fine particulate matter (PM _{2.5})	0.8 (exhaust only)	54 (exhaust only)

As shown in Table 2, the proposed project would result in construction emissions that are well below the applicable air quality significance thresholds. Therefore, the proposed project would not violate an air quality standard, contribute to an existing or projected air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants. Criteria air pollutant impacts would be less than significant.

Impact AQ-4: The proposed project would not expose sensitive receptors to substantial pollutant concentrations. (Less than Significant)

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. The ARB identified diesel particulate matter (DPM) as a TAC in 1998, primarily based on evidence demonstrating cancer effects in humans.⁶⁰ Mobile sources such as trucks and buses are among the primary sources of diesel emissions, and concentrations of DPM are higher near heavily traveled roadways. 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. Heavy-duty vehicles and equipment used during construction activities would result in emissions of DPM, an identified TAC.

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. 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.

⁶⁰ California Air Resources Board (ARB). *Fact Sheet, The Toxic Air Contaminant Identification Process: Toxic Air Contaminant Emissions from Diesel-fueled Engines*, October 1998.

The project area is located within Sharp Park, which includes a golf course, many trails/two , and passive recreational areas. The nearest sensitive receptors from the HSP area, in which the proposed sediment and emergent vegetation removal and other project activities would occur, are residential uses located approximately 600 feet east and southeast of the project site. The nearest sensitive receptors from the area, in which the proposed realignment of the golf cart path would take place, are residential uses located approximately 350 feet northeast of the project site.

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.⁶¹ 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.⁶² 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, of which DPM is a major component of, have decreased by 83 percent from previous estimates for the SFBAAB.⁶³ 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).⁶⁴

Additionally, a number of federal and state regulations require 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 would 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 for several 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.⁶⁵ Furthermore, California regulations limit maximum idling times to five minutes, which further reduces public exposure to DPM emissions.⁶⁶

Moreover, 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

⁶¹ ARB. *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.

⁶² ARB. *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.

⁶³ ARB. *In-Use Off-Road Equipment, 2011 Inventory Model*, Query accessed online, April 2, 2012, http://www.arb.ca.gov/msei/categories.htm#inuse_or_category.

⁶⁴ ARB. *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.

⁶⁵ United State Environmental Protection Agency (USEPA). “Clean Air Nonroad Diesel Rule: Fact Sheet,” May 2004.

⁶⁶ California Code of Regulations, Title 13, Division 3, § 2485.

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."⁶⁷

In summary, project-level analyses of construction activities have a tendency to produce overestimated assessments of long-term health risks. As discussed above, DPM is a component of PM₁₀, which is often used as a surrogate for estimating DPM emissions. As shown above in Impact AQ-3, the proposed project's DPM emissions would be well below the criteria air pollutant significance thresholds; on-road heavy-duty diesel vehicles and off-road equipment would be used only temporarily during the approximate 60-day (over 18 months in accordance with the Biological Opinion) construction duration and would not expose sensitive receptors to substantial air pollutants. Furthermore, the proposed project's construction contractors would be required to comply with California regulations limiting idling to no more than five minutes, which would further reduce nearby sensitive receptor's exposure to temporary and variable DPM emissions. Therefore, construction period TAC emissions would result in a less-than-significant impact to nearby sensitive receptors.

Impact AQ-5: The proposed project would not create objectionable odors affecting a substantial number of people. (Less than Significant)

Organic material in soil can decompose through anaerobic processes⁶⁸ and generate methane and hydrogen sulfide gases, which can then be released into the environment once soil is exposed. Soil excavation and soil/vegetation removal associated with the proposed project would be minimal and temporary, and therefore would not generate odors that would affect a substantial number of people. Similarly, equipment exhaust could occasionally emit odors attributed to gasoline combustion, but any such odors would be temporary, limited only to the approximately 60-day (over 18 months in accordance with the Biological Opinion) construction period, and would cease upon completion of construction activities. Therefore, the proposed project's construction activities would not create objectionable odors affecting a substantial number of people and odor impacts would be less than significant.

Impact C-AQ: The proposed project, in combination with past, present, and reasonably foreseeable future development in the project area, would not make a considerable contribution to any cumulative significant air quality impacts. (Less than Significant with Mitigation)

As described in Impact AQ-3, 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.⁶⁹ 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 cumulatively considerable net increase in criteria air pollutants. Therefore, because the proposed project's construction criteria air pollutant impact (Impact AQ-3) would not exceed the project-level thresholds for criteria air pollutants, the

⁶⁷ BAAQMD, *CEQA Air Quality Guidelines*, May 2011, page 8-6.

⁶⁸ Anaerobic process means a process which only occurs in the absence of molecular oxygen.

⁶⁹ BAAQMD, *CEQA Air Quality Guidelines*, June 2010; and adopted Thresholds of Significance, June 2010, p. 2-1. Available online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA_Guidelines.aspx. Accessed April 18, 2012.

proposed project would not result in a cumulatively considerable contribution to regional air quality impacts.

The project’s temporary and incremental increase in DPM emissions resulting from construction activities would be minor and would not contribute substantially to cumulative concentrations of DPM or other toxic air contaminants that could affect nearby sensitive land uses.

With regard to fugitive dust emissions, these emissions result in a localized air quality impact as larger particulate matter particles tend to settle out of the atmosphere relatively close to dust generating activities. Construction of the proposed project is not anticipated to occur in proximity to other construction activities such that cumulative fugitive dust impacts would occur. However, should other construction activities occur concurrently and in close proximity to the project’s construction activities, there is a potential, although a relatively low potential, for significant cumulative fugitive dust impacts. The proposed project would be required to comply with **Mitigation Measure M-AQ-2**, reducing the project’s contribution to any potential cumulative fugitive dust impact to a less-than-significant level.

<u>Topics:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporated</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>	<u>Not Applicable</u>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

Gases that trap heat in the atmosphere are referred to as greenhouse gases (GHGs) because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse does. The accumulation of GHGs has been implicated as the driving force for global climate change. The primary GHGs are carbon dioxide, methane, nitrous oxide, ozone, and water vapor.

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 (CO₂), methane (CH₄), and nitrous oxide (N₂O) are largely emitted from human activities, accelerating the rate at which these compounds occur within 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 CO₂. Black carbon is produced naturally and by human activities as a result of the incomplete combustion of fossil fuels, biofuels and biomass.⁷⁰

⁷⁰ Center for Climate and Energy Solutions. *What is Black Carbon?*, April 2010. Available online at: <http://www.c2es.org/docUploads/what-is-black-carbon.pdf>. Accessed September 27, 2012.

N₂O is a byproduct of various industrial processes and has a number of uses, including use as an anesthetic and as an aerosol propellant. Other GHGs include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, and are generated in certain industrial processes. Greenhouse gases are typically reported in “carbon dioxide-equivalent” measures (CO₂E).⁷¹

There is international scientific consensus that human-caused increases in GHGs have and will continue to contribute to global warming. 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.⁷² Secondary effects of climate change are likely to include a global rise in sea level, impacts to agriculture, the state’s electricity system, and native freshwater fish ecosystems, an increase in the vulnerability of levees in the Sacramento-San Joaquin Delta, changes in disease vectors, and changes in habitat and biodiversity.^{73,74}

The California Air Resources Board (ARB) estimated that in 2009 California produced about 457 million gross metric tons of CO₂E (MMTCO₂E).⁷⁵ The ARB found that transportation is the source of 38 percent of the State’s GHG emissions, followed by electricity generation (both in-state generation and imported electricity) at 23 percent and industrial sources at 18 percent. Commercial and residential fuel use (primarily for heating) accounted for nine percent of GHG emissions.⁷⁶ In the Bay Area, the transportation (on-road motor vehicles, off-highway mobile sources, and aircraft) and industrial/commercial sectors were the two largest sources of GHG emissions, each accounting for approximately 36 percent of the Bay Area’s 95.8 MMTCO₂E emitted in 2007.⁷⁷ Electricity generation accounts for approximately 16 percent of the Bay Area’s GHG emissions followed by residential fuel usage at seven percent, off-road equipment at three percent and agriculture at one percent.⁷⁸

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 emissions of GHGs would be progressively reduced, as follows: by 2010, reduce GHG emissions to 2000 levels (approximately 457 MMTCO₂E); by 2020, reduce emissions to 1990 levels (estimated at 427 MMTCO₂E); and by 2050 reduce statewide GHG emissions to 80 percent below 1990 levels (approximately 85 MMTCO₂E).

⁷¹ 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.

⁷² California Climate Change Portal. Available online at: <http://www.climatechange.ca.gov>. Accessed September 25, 2012.

⁷³ California Climate Change Portal. Available online at: <http://www.climatechange.ca.gov>. Accessed September 25, 2012.

⁷⁴ California Energy Commission. California Climate Change Center. *Our Changing Climate 2012*. Available online at: <http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf>. Accessed August 21, 2012.

⁷⁵ ARB. *California Greenhouse Gas Inventory for 2000-2009 – by Category as Defined in the Scoping Plan*. Available online at: http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-09_2011-10-26.pdf. Accessed August 21, 2012.

⁷⁶ ARB. *California Greenhouse Gas Inventory for 2000-2009 – by Category as Defined in the Scoping Plan*. Available online at: http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-09_2011-10-26.pdf. Accessed August 21, 2012.

⁷⁷ BAAQMD. *Source Inventory of Bay Area Greenhouse Gas Emissions: Base Year 2007*, February 2010. Available online at: http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/Emission%20Inventory/regionalinventory2007_2_10.ashx. Accessed August 21, 2012.

⁷⁸ BAAQMD. *Source Inventory of Bay Area Greenhouse Gas Emissions: Base Year 2007, Updated: February 2010*. Available online at: http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/Emission%20Inventory/regionalinventory2007_2_10.ashx. Accessed August 21, 2012.

In response, the California legislature passed Assembly Bill No. 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 feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction from forecast emission levels).⁷⁹

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.⁸⁰ The Scoping Plan estimates a reduction of 174 million metric tons of CO₂E (MMTCO₂E) (about 191 million U.S. tons) from the transportation, energy, agriculture, forestry, and high global warming potential sectors, see Table 3, below. ARB has identified an implementation timeline for the GHG reduction strategies in the Scoping Plan.⁸¹

Table 3. GHG Reductions from the AB 32 Scoping Plan Sectors^{82,83}

GHG Reduction Measures By Sector	GHG Reductions (MMT CO₂E)
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	9
• Extended Producer Responsibility	
• Environmentally Preferable Purchasing	
Total	41.8-42.8

⁷⁹ 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. Available online at: <http://opr.ca.gov/docs/june08-ceqa.pdf>. Accessed August 21, 2012.

⁸⁰ ARB. *California’s Climate Plan: Fact Sheet*. Available online at: http://www.arb.ca.gov/cc/facts/scoping_plan_fs.pdf. Accessed August 21, 2012.

⁸¹ ARB. *Assembly Bill 32: Global Warming Solutions Act*. Available online at: <http://www.arb.ca.gov/cc/ab32/ab32.html>. Accessed August 21, 2012.

⁸² ARB. *Climate Change Scoping Plan*, December 2008. Available online at: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed August 21, 2012.

⁸³ ARB. *California’s Climate Plan: Fact Sheet*. Available online at: http://www.arb.ca.gov/cc/facts/scoping_plan_fs.pdf. Accessed August 21, 2012.

The AB 32 Scoping Plan recommendations are intended to curb projected business-as-usual growth in GHG emissions and reduce those emissions to 1990 levels. Therefore, meeting AB 32 GHG reduction goals would result in an overall annual net decrease in GHGs as compared to current levels and accounts 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 the State's GHG reduction goals. SB 375 requires regional transportation plans, developed by Metropolitan Planning Organizations (MPOs), to incorporate a "sustainable communities strategy" in their regional transportation plans (RTPs) 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 and the Bay Area Metropolitan Transportation Commission's 2013 RTP, Plan Bay Area, would be its first plan subject to SB 375.

AB 32 further anticipates that local government actions will result in reduced GHG emissions. ARB has identified a GHG reduction target of 15 percent from current levels for local governments themselves and noted that successful implementation of the Scoping Plan relies on local governments' land use planning and urban growth decisions 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.⁸⁴ The BAAQMD has conducted an analysis of the effectiveness of the region in meeting AB 32 goals from the actions outlined in the Scoping Plan and determined that in order for the Bay Area to meet AB 32 GHG reduction goals, the Bay Area would need to achieve an additional 2.3 percent reduction in GHG emissions from the land use driven sector.⁸⁵

At a local level, the City has developed a number of plans and programs to reduce the City's 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 City's GHG emissions for the year 1990, the baseline level with reference to which target reductions are set; by 2017, reduce GHG emissions by 25 percent below 1990 levels; by 2025, reduce GHG emissions by 40 percent below 1990 levels; and finally by 2050, reduce GHG emissions by 80 percent below 1990 levels. San Francisco's Greenhouse Gas Reduction Strategy documents the City's actions to pursue cleaner energy, energy conservation, alternative transportation and solid waste policies. As identified in the Greenhouse Gas Reduction Strategy, the City has implemented a number of mandatory requirements and incentives that have measurably reduced GHG emissions including, but not limited to, 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 (including buses), and a mandatory recycling and composting ordinance.

The Greenhouse Gas Reduction Strategy concludes that San Francisco's policies and programs have resulted in a reduction in GHG emissions below 1990 levels, exceeding statewide AB 32

⁸⁴ ARB. *Climate Change Scoping Plan*. December 2008. Available online at:

http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed August 21, 2012.

⁸⁵ BAAQMD. *California Environmental Quality Act Guidelines Update, Proposed Thresholds of Significance*, December 2009. Available online at:

<http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/Proposed%20Thresholds%20of%20Significance%20Dec%207%202009.ashx>. Accessed September 25, 2012.

GHG reduction goals. San Francisco’s communitywide 1990 GHG emissions were approximately 6,201,949 MTCO₂E. As stated above, San Francisco GHG emissions in 2010 were 5,299,757 MTCO₂E, which is a 14.5 percent reduction in GHG emissions compared to 1990 levels. The reduction has largely come from the electricity sector, from 2,032,085 MTCO₂E (year 1990) to 1,333,959 MTCO₂E (year 2010), and waste sector, from 472,646 MTCO₂E (year 1990) to 244,625 MTCO₂E (year 2010).⁸⁶

Impact C-GG: The proposed project would generate greenhouse gas emissions, but not in 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 associated with land use decisions are CO₂, CH₄, and N₂O.⁸⁷ Individual projects contribute to the cumulative effects of climate change by directly or indirectly emitting GHGs during construction and operational phases. As discussed in Section E.7, Air Quality, ongoing maintenance activities that result in operational GHG emissions (e.g., vehicle trips, etc.) are expected to be substantially similar to existing levels, and therefore operational GHG emissions would not measurably increase upon project completion. This analysis therefore focuses on GHG emissions that would be emitted during construction activities.

The project’s construction activities would contribute to temporary increases in GHGs emissions. During construction, which is anticipated to occur for approximately 60 days over 18 months in the appropriate construction window in accordance with the Biological Opinion, GHGs would be emitted from the combustion of fuel used for construction equipment, vehicles used for worker commuting, and trucks transporting materials to and from the project site.

CO₂E emissions from project construction activities were quantified using the CalEEMod modeling software (version CalEEMod.2011.1).⁸⁸ Results of this analysis indicate that the proposed project would emit 30 MTCO₂E during construction. While neither the BAAQMD, nor any other jurisdiction, has identified quantifiable thresholds for construction period GHG emissions, the BAAQMD, in their 2011 CEQA Air Quality Guidelines, did identify an operational GHG threshold of 1,100 MTCO₂E per year. Estimated construction emissions would be well below this level and would cease upon completion of construction activities. Thus, GHG emissions from the proposed project would result in a less-than-significant impact.

<u>Topics:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporated</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>	<u>Not Applicable</u>
----------------	---------------------------------------	---	-------------------------------------	------------------	-----------------------

9. WIND AND SHADOW—Would the project:

⁸⁶ San Francisco Department of Environment (SFDOE). *San Francisco Community -Wide Carbon Emissions by Category, Excel spreadsheet provided via email between Pansy Gee, SFDOE and Wade Wietgreffe, San Francisco Planning Department, June 7, 2013.*

⁸⁷ OPR. *Technical Advisory- CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review*, June 19, 2008. Available at the Office of Planning and Research’s website at: <http://www.opr.ca.gov/ceqapdfs/june08-ceqa.pdf>. Accessed March 3, 2010.

⁸⁸ CalEEMod. Available online at: <http://www.caleemod.com/>. Accessed February 26, 2013.

<u>Topics:</u>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
a) Alter wind in a manner that substantially affects public areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Impact WS-1: The proposed project would not alter wind in a manner that substantially affects public areas. (No Impact)

The proposed project would not include construction of any above-ground structures that would alter wind patterns. The proposed project would not remove any structures or trees in a way that would result in substantial changes in wind patterns on the project site or in its vicinity. Therefore, the proposed project would not substantially alter wind patterns on the project site and in its vicinity, and no wind impact would result from the proposed project.

Impact WS-2: The proposed project would not create new shadow in a manner that could substantially affect outdoor recreation facilities or other public areas. (No Impact)

No new above-ground structures would be constructed except for the minor structures to be constructed around the pumphouse and realigned golf course path segment. Given the height and scale of these structures, no new shadow that would affect the use or enjoyment of Sharp Park would result from the proposed project. As a result, no shadow impact would result from the proposed project.

Impact C-WS: the proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not make a considerable contribution to any cumulative significant impacts related to wind or shadow. (Less than Significant)

As of September 2013, there are no known past or present projects in the project vicinity that would, in combination of the proposed project, result in cumulative wind or shadow impacts during the construction period of the proposed project. The Draft EIR prepared for the proposed 2006 SNRAMP, a reasonably foreseeable future project in the proposed project’s vicinity, addressed potential ground-level wind hazards and windthrow risks resulting from tree removal and concluded that the proposed 2006 SNRAMP would not result in any significant impacts with respect to wind. The Initial Study prepared for the proposed 2006 SNRAMP concluded that the proposed 2006 SNRAMP would not result in any significant impacts with respect to shadow. A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the environment, including wind and shadow impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.⁸⁹ Therefore, no cumulative wind or shadow impact within the project vicinity exists to which this project could potentially contribute.

⁸⁹ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

The proposed project, as discussed above, would not substantially alter wind on the project site and in its vicinity and would have no impacts on shadow. Therefore, the proposed project would not contribute to a cumulative wind or shadow impact, even if one existed.

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Physically degrade existing recreational resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Impact RE-1: The proposed project would not physically degrade existing recreational resources or increase the use of existing neighborhood parks or other recreational facilities, such that substantial physical deterioration of the facilities would occur or be accelerated. (Less than Significant)

The proposed project would not close or substantially modify any portion of the Sharp Park Golf Course. The proposed project involves improvements to existing facilities and creation of habitat for CRLF and SFGS at Sharp Park. Most of the proposed activities, except for the realignment of the golf cart path segment, would occur in areas that are not used for recreation or are off limits to the public.

The realignment of the golf cart path segment would take approximately 5 days to complete. Given the small scale of this project and SFRPD’s intent to provide continuous play during construction, the proposed project would not substantially affect recreational resources on the project site or in its vicinity, and therefore would not result in physical deterioration of Sharp Park or result in increased use of nearby parks.

In light of the above, this impact is less than significant.

Impact RE-2: The proposed project would not require construction or expansion of recreational facilities that would have an adverse physical effect on the environment. (No Impact)

The proposed project would not result in new uses that would increase the demand for parks or recreational facilities. Therefore, the proposed project would not require construction or expansion of recreational facilities, and would have no impact.

Impact C-RE: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not make a considerable contribution to any cumulative significant recreation impacts. (Less than Significant)

The Draft EIR prepared for the proposed 2006 SNRAMP, a reasonably foreseeable future project in the proposed project's vicinity, concluded that the proposed 2006 SNRAMP in combination with the GGNRA Dog Management Plan would result in a significant and unavoidable cumulative impact with respect to recreation as a result of closure of Dog Play Areas. However, dogs are not now, and will not under proposed project conditions, be allowed at Sharp Park, so none of the significant recreation impacts identified in the Draft EIR for the proposed 2006 SNRAMP would combine with any element of the proposed project to result in a cumulatively considerable recreation impact.

A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the environment, including recreation impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.⁹⁰

As discussed above, the proposed project would not generate additional demand for parks or recreational facilities. Therefore, the proposed project would not contribute to a cumulative impact with respect to recreation.

<u>Topics:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporated</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>	<u>Not Applicable</u>
11. UTILITIES AND SERVICE SYSTEMS – Would the project:					
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

⁹⁰ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

<u>Topics:</u>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Impact UT-1: Implementation of the proposed project would not significantly affect wastewater collection and treatment facilities or exceed wastewater treatment requirements of the SFRWQCB, and would not require or result in the construction of new stormwater drainage facilities or expansion of existing facilities. (No Impact)

The project would not generate wastewater or stormwater, and therefore would not result in the construction of new wastewater or stormwater facilities or the expansions of existing facilities. Therefore, no impact would result from the proposed project with respect to wastewater collection or treatment facilities.

Impact UT-2: the proposed project would not require expansion or construction of new water supply or treatment facilities. (Less than Significant)

The project would likely require water for cleaning of construction equipment and may use water during construction to control fugitive dust as discussed in Section E.7, Air Quality. Additionally, the project could require water for irrigation of plants to ensure successful establishment (approximately once a month between June and September). Water would be provided by the existing golf course water source, which is municipal water provided by the North Coast County Water District.

The demand for such water use can be fully met by existing water supply capacity and would not require new or expanded water supply resources. Therefore, the proposed project's impacts on water supply would be less than significant.

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

Minor quantities of solid waste and recyclable material would be generated during the construction of the proposed project. The sediment and vegetation removed from the site would be transported to the former rifle range site, on the east side of PCH, within Sharp Park. A small amount of construction debris would be generated from the demolition of the retaining wall and would be disposed of at a landfill with sufficient capacity that would be selected by the project contractor. As such, the project would not substantially impact landfill capacity.

Impact UT-4: The proposed project would follow all applicable statutes and regulations related to solid waste. (No Impact)

The proposed project would follow all applicable statutes and regulations related to solid waste, and therefore no impact would result from the proposed project.

Impact C-UT: the proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not make a considerable contribution to any cumulative significant impacts related to utilities or service systems. (Less than Significant)

As of September 2013, there are no known past or present projects in the project vicinity that would, in combination of the proposed project, result in cumulative impacts with respect to utilities and service systems. The Draft EIR prepared for the proposed 2006 SNRAMP, a reasonably foreseeable future project in the proposed project’s vicinity, concluded that the proposed 2006 SNRAMP would not result in any significant impacts with respect to utilities or service systems.

The Final Draft Supplemental Initial Study/Mitigated Negative Declaration was prepared by the North Coast County Water District concerning the amended Sharp Park Recycled Water Project, which consists of construction of infrastructure necessary to provide tertiary treated water from Calera Creek Water Recycling Plant to irrigation sites in the Sharp Park area. The Final Draft Supplemental Initial Study/Mitigated Negative Declaration determined that with implementation of mitigation measures the amended Sharp Park Recycled Water Project would not result in any significant impacts.⁹¹

A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the environment, including utilities and service systems impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.⁹² Thus, no cumulative impact to utilities or service systems within the project vicinity exists to which this project could potentially contribute.

The proposed project would not require a substantial amount of water and would not result in any significant impacts on utilities or service systems in the project area. Existing service management plans address anticipated growth in the region. The proposed project would not contribute to a cumulative impact on utilities and service systems, even if one existed.

<u>Topics:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporated</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>	<u>Not Applicable</u>
12. PUBLIC SERVICES— Would the project:					

⁹¹ North Coast County Water District. *Draft Supplemental Initial Study/Mitigated Negative Declaration, North Coast County Water District Water Recycling Storage Tank Location Project*, July 2007. This document is available online at: <http://www.nccwd.com/Draft%20Supplemental%20July%202007.pdf>. Accessed August 29, 2013.

⁹² San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

<u>Topics:</u>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Impact PS-1: The proposed project would not increase demand for fire protection or police service to an extent that would result substantial adverse impacts associated with the provision of such service. (No Impact)

The proposed project does not include any new habitable structures which would require fire protection and police services. Workers for the proposed project would consist of SFRPD employees and contractors, totaling approximately three to ten individuals. Potential increases in visitor use levels as a result of an improved Sharp Park, if any, would be adequately served by the existing capabilities of service providers. Therefore, no impact to fire protection or police service would result from the proposed project.

Impact PS-2: The proposed project would not indirectly generate new students, and would not require new or physically altered school facilities. (No Impact)

The project does not propose any new habitable structures, and therefore would not generate new students. Therefore, the project would not require a new school or expansion of school facilities and no impact to public schools would result from the proposed project.

Impact C-PS: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not make a considerable contribution to any cumulative significant effects related to public services. (No Impact)

As of September 2013, there are no known past or present projects in the project vicinity that would, in combination of the proposed project, result in impacts to public. The Initial Study prepared for the proposed 2006 SNRAMP concluded that the proposed 2006 SNRAMP would not result in any significant impacts with respect to public services. A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the environment, including public services impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.⁹³ Thus, no cumulative impact to public services within the project vicinity exists to which this project could potentially contribute.

Public service providers accommodate growth within their service areas by responding to forecasted population growth and land use changes. The proposed project would have no

⁹³ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

impacts to public services. Therefore, the proposed project would not contribute to a cumulative impact on public services, even if one existed.

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Regulatory Setting

Endangered Species Act

The FESA (16 United States Code [USC], 1531-1543) was enacted in 1973. Under the FESA, the Secretary of the Interior and the Secretary of Commerce have the authority to list a species as threatened or endangered (16 USC Section 1533[c]). The FESA is administered by both the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) and the USFWS. NOAA NMFS is responsible for the protection of FESA-listed marine species, including marine fish, most marine mammals, and anadromous fish. The USFWS has

jurisdiction over listed wildlife, plant, and commercial fish species and proposed or candidate species.

Pursuant to the requirements of the FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any FESA-listed threatened or endangered species may be present in the project site and determine whether the proposed project would have a potentially-significant impact on such species. In addition, the agency is required to determine whether the proposed project is likely to jeopardize the continued existence of⁹⁴ any species listed or proposed to be listed under the FESA or result in the destruction or adverse modification of critical habitat designated or proposed to be designated for such species (16 USC Section 1536). If so, project-related impacts to these species or their habitats would be considered significant and would require mitigation.

Section 9 of the FESA lists those actions that are prohibited, including take⁹⁵ of listed species of fish and wildlife. "Take" of listed species can be authorized through either the Section 7 consultation process for actions undertaken by federal agencies, or through the Section 10 permit process for actions undertaken by non-federal agencies where a Section 404 permit or other federal approval is not required.

Federal actions include activities that are on federal land, conducted by a federal agency, funded by a federal agency, or authorized by a federal agency (including issuance of federal permits and licenses). Under Section 7, the federal agency conducting, funding, or permitting an action (the federal lead agency) must consult the NOAA NMFS or USFWS, as appropriate, to ensure that the proposed action will not jeopardize endangered or threatened species or destroy or adversely modify designated critical habitat. Regulations governing interagency cooperation under Section 7 are found at 50 Code of Federal Regulations (CFR), Part 402.

If a proposed project "may affect" a listed species or designated critical habitat, the project sponsor is required to prepare a Biological Assessment evaluating the nature and severity of the expected effect. In response, the NOAA NMFS or USFWS issues a Biological Opinion with a determination that the proposed action may either jeopardize the continued existence of one or more listed species (jeopardy finding), result in the destruction or adverse modification of critical habitat (adverse modification finding), not jeopardize the continued existence of any listed species (no jeopardy finding), or not result in adverse modification of critical habitat (no adverse modification finding). The Biological Opinion issued by the NOAA NMFS or USFWS may stipulate discretionary "reasonable and prudent" conservation measures, and if the project would not jeopardize a listed species, the NOAA NMFS or USFWS issues an incidental take statement to authorize the proposed activity. Projects that would result in a "take" of a federally-listed threatened or endangered species would be required to obtain authorization from NOAA NMFS or USFWS through an incidental take permit.

The proposed improvements to the existing pumphouse and sediment and emergent vegetation removal activities would require a Section 404 permit pursuant to the FCWA, as described below. The USACE is the federal agency that issues a permit under Section 404 of the FCWA and thus

⁹⁴ "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of the species. 50 Code of Federal Regulations (C.F.R) §402.02.

⁹⁵ FESA defines "take" as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns, such as breeding, feeding, or sheltering. "Harass" is further defined as actions that create the likelihood of injury to listed species to an extent that significantly disrupts normal behavior patterns, which include breeding, feeding, and sheltering.

establishes a federal nexus with the FESA, requiring Section 7 consultation. The SFRPD has already consulted with the USFWS under the Section 7 consultation process, and the USFWS issued a Biological Opinion in October, 2012 concerning the proposed project.⁹⁶

Clean Water Act

The FCWA (33 USC, 1251-1376) was enacted as an amendment to the Federal Water Pollution Control Act of 1972, which outlined the basic structure for regulating discharges of pollutants into waters of the U.S. The FCWA serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands.

Waters of the U.S. are areas subject to federal jurisdiction pursuant to Section 404 of the FCWA. In order to be protected under the FCWA Sections 404 and 401, wetlands and other waters of the U.S. must be classified as one of the following:⁹⁷

- Traditional navigable waters;
- Wetlands next to traditional navigable waters;
- Nonnavigable tributaries of traditional navigable waters that are relatively permanent, where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); or
- Wetlands that directly abut the tributaries described in the previous bullet.

The USACE would decide jurisdiction over the following waters, based on a fact-specific analysis, to determine whether they have a significant nexus with a traditional navigable water:⁹⁸

- Nonnavigable tributaries that are not relatively permanent;
- Wetlands next to nonnavigable tributaries that are not relatively permanent; or
- Wetlands next to but that do not directly abut a relatively permanent nonnavigable tributary.

Waters of the U.S. are typically divided into two types: 1) wetlands and 2) other waters of the U.S. Wetlands are "areas that are inundated or saturated by surface or groundwater 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" (33 CFR Section 328.3[b], 40 CFR Section 230.3). To be considered subject to federal jurisdiction, a wetland must normally support hydrophytic vegetation (plants growing in water or wet soils), hydric soils, and wetland hydrology.⁹⁹ Other waters of the U.S. are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface water features, that exhibit an ordinary high-water mark but lack positive indicators for the three wetland parameters (33 CFR Section 328.4).

Under FCWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the U.S. must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water

⁹⁶ USFWS. *Biological Opinion*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

⁹⁷ U.S. Army Corps of Engineers (USACE). *Revised Guidance on Clean Water Act Jurisdiction Following the Supreme Court Decision in Rapanos v. U.S. and Carabell v. U.S.*, December 2, 2008. Available online at: <http://www.usace.army.mil/missions/civilworks/regulatoryprogramandpermits/relatedresources/cwaguidance.aspx>. Accessed May 17, 2013.

⁹⁸ Ibid.

⁹⁹ USACE. *Corps of Engineers Wetland Delineation Manual*, January 1987. Available online at: <http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf>. Accessed May 17, 2013.

pollution control agency with jurisdiction over affected water at the point where the discharge would originate. The California Regional Water Quality Control Boards (RWQCBs) administer this certification. Therefore, all projects that have a federal component and that may affect state water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with FCWA Section 401.

FCWA Section 402 authorizes the USEPA to regulate water quality in California by controlling the discharge of pollutants to water bodies from point sources (a municipal or industrial discharge at a specific location or pipe) and nonpoint sources (diffuse runoff of water from adjacent land uses) through the NPDES. Federal regulations issued in November 1990 and revised in 2003 expanded the authority of the California State Water Resources Control Board to permit stormwater discharges from municipal storm sewer systems, industrial processes, and construction sites that disturb areas larger than one acre. Within the San Francisco limits, NPDES permits are administered by the SFBRWQCB.

FCWA Section 404 regulates the discharge of dredged and fill materials into waters of the U.S. Applicants must obtain a permit from the USACE for discharges of dredged or fill material into waters of the U.S., including wetlands, before proceeding with a proposed activity. The USACE may issue either an individual permit evaluated on a case-by-case basis or a general permit evaluated at a program level for a series of related activities. General permits are preauthorized and are issued to cover multiple instances of similar activities expected to cause only minimal adverse environmental effects. Nationwide permits (NWP) are a type of general permit issued to cover particular activities that would result in the deposition of fill material into waters of the U.S. Each NWP specifies particular conditions that must be met for the NWP to apply to a particular project. Waters of the U.S. in the project area are under the jurisdiction of the San Francisco District of the USACE.

Implementing regulations by the USACE are found at 33 CFR, Parts 320-330. Guidelines for implementation are referred to as the Section 404(b)(1) Guidelines and were developed by the USEPA in conjunction with the USACE (40 CFR, Part 230). The guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

The proposed project would require a Section 404 CWA NWP for the proposed work within the jurisdictional wetlands.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 USC, 703-711) implements a treaty signed by the United States, Canada, Mexico, and Japan that makes it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill migratory birds. The law also applies to the removal of nests (such as swallow nests on bridges) occupied by migratory birds during the breeding season. The MBTA states that it is unlawful to take these species, their nests, their eggs, or their young anywhere in the United States.

California Endangered Species Act (CESA)

CESA (Fish & Game Code Section 2050, et seq.), which is administered by the CDFW,¹⁰⁰ prohibits the take¹⁰¹ of plant and animal species designated by the Fish and Game Commission as either threatened or endangered in the State of California. Section 2081 of CESA allows the CDFW to

¹⁰⁰ Formally known as the CDFG

¹⁰¹ "Take" in the context of CESA means to hunt, pursue, kill, or capture a listed species, as well as any other actions that may result in adverse impacts when attempting to take individuals of a listed species. The take prohibitions also apply to candidates for listing under CESA.

authorize exceptions to the state's prohibition against take of a listed species, such as for educational, scientific, or management purposes. Private developers whose projects do not involve a state lead agency under CEQA may not take a listed species without formally consulting with the CDFW and agreeing to strict measures and standards for protection of listed species.

Species in the project area, CRLF, WPT, salt marsh common yellowthroat, and San Francisco dusky-footed woodrat are not formally designated as threatened or endangered under the CESA, but are considered a California SSC. No formal consultation with the CDFW under the CESA is required for this project.

California Fish and Game Code

Sections 1600-1616

Under these sections of the Fish and Game Code, CDFW jurisdiction is determined to occur within the water body of any natural river, stream, or lake. The term stream, which includes creeks and rivers, is defined in Title 14, CCR, Section 1.72. The applicant is required to notify CDFW before constructing any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental review process. When a fish or wildlife resource may be substantially adversely affected, CDFW is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project. The proposed project would require a Streambed Alteration Agreement from the CDFW.

Sections 3511, 4700, 5515, and 5050

The classification of fully protected species was the state's initial effort to identify and provide additional protection to those animals that were rare or that faced possible extinction. Lists were created for fish, amphibians and reptiles, birds, and mammals. Most of the species on these lists have subsequently been listed under either the state or federal endangered species act or both, although there are several exceptions, including the golden eagle. The Fish and Game Code sections dealing with fully protected species state that these species "...may not be taken or possessed at any time and no provision of this code or any other law would be construed to authorize the issuance of permits or licenses to take any fully protected" species, although take may be authorized for necessary scientific research. This language arguably makes the "fully protected" designation the strongest and most restrictive regarding the take of these species. In 2003, the code sections dealing with fully protected species were amended to allow the CDFW to authorize the taking of those species for necessary scientific research, including efforts to recover fully protected, threatened, or endangered species.

SFGS is a fully protected species under the CESA and the proposed project, which is designed to enhance habitat for this species and its primary food source, CRLF, constitutes a recovery action pursuant to the Fish and Game Code. The SFRPD is required to consult with the CDFW prior to implementation of the proposed project.

Sections 3503 and 3513

Section 3503 prohibits the take and possession of any bird egg or nest, except as otherwise provided by the Fish and Game Code or subsequent regulations. Further, Section 3513 provides for the adoption of the MBTA's provisions. As with the MBTA, this state code offers no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of nongame migratory birds. The administering agency for these sections is the CDFW.

Environmental Setting

The proposed project would be implemented entirely within Sharp Park (see Figure 3). Sharp Park provides habitat which supports several special-status species and high natural resource and recreational values that include Sanchez Creek, a free-flowing creek, LS, a large brackish lake, and associated wetlands including HSP and the connecting channel. It is situated between two regionally significant open spaces, Milagra and Sweeney Ridges. Sharp Park also provides: regionally important wildlife habitat and connections between habitat, attractive habitat for resident and migratory birds, and significant stands of coastal scrub habitat.

The information contained in this section is based on the information contained in the Biological Assessment¹⁰² prepared by the SFRPD for this project, the Biological Opinion issued by the USFWS in October 2012 for this project, and two wetland delineation reports^{103,104} prepared in November 2008 and May 2013.

Special-Status Species

The analysis of special-status species in this Initial Study addresses all special-status species anticipated to occur within the project area. For the purposes of this Initial Study, the term “special-status species” includes species that are: 1) legally protected by the FESA, CESA, or MBTA; or 2) locally significant sensitive species, including species on the National Audubon Society’s Watch List or those under threat of local extirpation, as determined by the Yerba Buena chapter of the California Native Plant Society (CNPS) or the Golden Gate chapter of the National Audubon Society. State and federally listed species known to occur or that have been recorded historically in the project vicinity are presented in Table 4, below.

Legally protected species include species that are federally listed as endangered, threatened, or candidate species,¹⁰⁵ that are state listed as endangered, rare, threatened, California fully protected, or SSC, or that are listed in the MBTA. Protected species also include those listed as 1A or 1B on the CNPS plant list; that is, the 1A list is for plants presumed extirpated in California, and the 1B list is for plants that are rare, threatened, or endangered in California and elsewhere. No special-status plant species that are required to be addressed under CEQA Guidelines 15380¹⁰⁶ are known to occur within the project area.

¹⁰² SFRPD. *Biological Assessment*. This Biological Assessment was amended on August 16, 2012. These documents are available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁰³ Tetra Tech, Inc. *LS Wetland Determination Report*. This report is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁰⁴ SFRPD. *Single Parameter Wetland Delineation Report*. This document is available for as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁰⁵ “Candidate species” are plants and animals for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the FESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities.

¹⁰⁶ CEQA Guidelines Section 15380 provides that a plant or animal species may be treated as rare or endangered even if it is not on one of the official lists but otherwise meets the criteria for an endangered or rare species (e.g., it is likely to become endangered in the foreseeable future). For this reason, this Initial Study also addresses locally significant species, which include species on CNPS List 2A (plants presumed extirpated in California, but more common elsewhere), CNPS List 2B (plants rare, threatened, or endangered in California, but more common elsewhere), CNPS List 3 (plants about which more information is needed), and CNPS List 4 (plants of limited distribution).

The species from all lists are important for local conservation efforts and thus are analyzed in this Initial Study. However, impacts to federal, state, and CNPS 1A and 1B listed species are given additional consideration because of their protected status by federal and/or state laws.

The Biological Opinion issued by the USFWS for the proposed project concluded that the proposed project would not be likely to adversely affect the mission blue butterfly (*Icaricia icarioides missionensis*) given that the project site is located at least 0.5 miles away from mission blue butterfly habitat and the mission blue butterfly is not expected to occur in the intervening areas.¹⁰⁷ The former rifle range site, to which the removed sediment and debris would be transported, is located approximately 0.4 miles from the closest known potential habitat for the mission blue butterfly.¹⁰⁸ Therefore, this Initial Study concludes that no impact would result from the proposed project. Thus, this species is not addressed further in this Initial Study.

The CNDDDB reports the occurrence of the bumblebee scarab beetle (*Lichnanthe ursina*) within Sharp Park. This species is not federally listed, but was a candidate for listing in the early 1990s. According to the CNDDDB, specimens were collected from dunes near LS and although the collection date is unknown, the population is presumed to be extant. The larval stage of this species lives in sand layers, while the adult phase prefers coastal dunes. As the proposed project would affect a very limited extent of coastal dune areas of Sharp Park and would not occur in the beach areas, it would not have a substantial impact on this species.

In addition to those species listed in Table 4, a number of bird species breed or occur at Sharp Park. Some of these bird species are designated as Species of Local Concern by the Golden Gate Audubon Society including: American goldfinch; American kestrel; band-tailed pigeon; black-crowned night heron; clark's grebe; gadwall; great horned owl; hairy woodpecker; hutton's vireo; pacific-slope flycatcher; pied-billed grebe; purple finch; red-shouldered hawk; red-tailed hawk; say's phoebe; steller's jay; swainson's thrush; tree swallow; and violet-green swallow.¹⁰⁹ Some of these bird species inhabit primarily forests or woodlands, which are a substantial distance away from the project area. Others may nest in the wetland and coastal scrub habitats present in the project area.

¹⁰⁷ USFWS. *Biological Opinion*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁰⁸ Lisa Wayne, SFRPD. *Email to Kei Zushi, San Francisco Planning Department, MBB: Sharp Park*, July 16, 2013. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁰⁹ EIP Associates (EIP). *Final Draft 2006 SNRAMP, Sharp Park, February 2006*. Available online at: <http://sfrecpark.org/parks-open-spaces/natural-areas-program/significant-natural-resource-areas-management-plan/snramp/>. Accessed September 11, 2013.

Table 4. Listed species that could potentially occur in the Project Area^{110,111,112}

Common Name	Scientific Name	Federal/State/ CNPS Status	Habitat	Likelihood of Occurrence/Notes on Occurrence
Reptiles and Amphibians				
California red-legged frog	<i>Rana aurora draytonii</i>	FT/SSC/--	Lowlands and foothills in or near permanent sources of deep water, with dense, shrubby, or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development.	C/ Recently observed at Sharp Park.
San Francisco garter snake	<i>Thamnophis sirtalis elegans</i>	FE/SE, SFP/--	Freshwater marshes, ponds, and slow-moving streams. Prefers dense cover and water depths of at least one foot.	C/ Reported near HSP in 2008.
Western pond turtle	<i>Clemmys marmorata</i>	--/SSC/--	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Needs basking sites and upland habitat for egg-laying. ¹¹³	C/ Presumed to occur at Sharp Park.
Birds				
Salt marsh common yellowthroat	<i>Geothlypis trichas sinuosa</i>	--/SSC/--	Saltwater and freshwater marshes. Requires thick cover for foraging and dense vegetation for nesting. ¹¹⁴	C/ Presently occurs at Sharp Park.

¹¹⁰ USFWS. *Biological Opinion*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹¹¹ USFWS. *Species*. Available online at: <http://www.fws.gov/species/>. Accessed July 11, 2013.

¹¹² CDFG. *California Natural Diversity Database, Special Animals (898 Taxa)*, January 2011. Available online at: <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdf>. Accessed July 11, 2013.

¹¹³ Swaim Biological Incorporated. *Sharp Park Wildlife Surveys and Special Status Reptile and Amphibian Restoration Recommendations*, December 4, 2008 (“Sharp Park Wildlife Surveys”). This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹¹⁴ Shuford, W. D., and Gardali, T., editors, Western Field Ornithologists and CDFG. *California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California, Studies of Western Birds No. 1*, February 2008. Available online at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentVersionID=19854>. Accessed July 12, 2013.

Black-crowned night heron	<i>Nycticorax nycticorax</i>	--/SA/--	Foothills and lowlands. Nesting takes place in thick-foliaged trees, dense fresh or brackish emergent wetlands, or dense shrubbery or vines near aquatic feeding areas. ¹¹⁵	P/ Presently occurs at Sharp Park.
Mammals				
San Francisco dusky-footed woodrat	<i>Neotoma fuscipes annectens</i>	--/SSC/--	Riparian and oak woodland forests with dense understory cover or thick chaparral habitat. ¹¹⁶	U/ Observed in Sharp Park, only on the east side of PCH.
Insects				
Myrtle's silverspot butterfly	<i>Speyeria zerene myrtleae</i>	FE/--/--	Coastal dunes, coastal prairie, and coastal scrub at elevations ranging from sea level to 1,000 feet, and as far as three miles inland. The adult butterflies prefer areas protected from onshore winds. Critical factors in the distribution of this species include presence of the presumed larval host plant, western dog violet (<i>Viola adunca</i>), and availability of nectar sources for adults. ¹¹⁷	U/ The CDFW's Natural Diversity Database indicates that this species was extirpated. By the late 1970s populations of this species south of the Golden Gate Bridge were believed to be extinct and extant populations were known only from Marin County at the Point Reyes National Seashore. ¹¹⁸
San Bruno elfin butterfly	<i>Callophrys mossii bayensis</i>	FE/--/--	Coastal chaparral, on steep north facing slopes, and in the fog-belt of the mountains near San Francisco Bay. This species closely follows the narrow, fragmented distribution of its larval host	U/ There are no rocky substrates or grassland habitats that contain the host plant for this species in the project area or its vicinity.

¹¹⁵ CDFW. *Stanislaus River Report, Black-crowned Night Heron*. Available online at: <http://www.dfg.ca.gov/delta/reports/stanriver/sr437.asp>. Accessed July 11, 2013.

¹¹⁶ H. T. Harvey & Associates. *Junipero Serra Traffic Calming Project Biological Resources Project, Project No. 3283-01*, September 26, 2011. This document is available for review as part of Case File No. 2012.1247E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹¹⁷ USFWS. *Recovery Plan for Seven Coastal Plants and the Myrtle's Silverspot Butterfly*, September 29, 1998. Available online at: http://ecos.fws.gov/docs/recovery_plan/980930d.pdf. Accessed July 11, 2013.

¹¹⁸ Ibid.

			plant, broadleaf stonecrop (<i>Sedum spathulifolium</i>). ¹¹⁹	
Bay checkerspot butterfly	<i>Euphydryas editha bayensis</i>	FT/--/--	Native grasslands on very large serpentine outcrops; secondary or “satellite” habitat islands of smaller serpentine outcrops with native grassland; and “tertiary” habitat areas, where both larval food plants occur on soils not derived from serpentine, but which have similarities to serpentine-derived soils. ¹²⁰	U/ There is no serpentine grassland habitat or grasslands supporting larval food plants of the bay checkerspot butterfly in the project area or its vicinity.
Plants				
San Francisco Bay spineflower	<i>Chorizanthe cuspidata var. cuspidata</i>	--/--/CNPS List 1B	Barren, disturbed sites on loose mineral soils. This species has been found in coastal prairie, coastal dune, coastal scrub, and coastal bluff scrub habitats. It occurs in Sonoma, Marin, San Francisco, San Mateo, and possibly Santa Clara counties; it is believed to have been extirpated in Alameda County. ¹²¹	U/ Last observed in 1925 in Sharp Park. Presumed extirpated from Sharp Park. ¹²²

¹¹⁹ USFWS. *San Bruno Elfin Butterfly and Mission Blue Butterfly, 5-year Review: Summary and Evaluation*, February 2010. Available online at: http://ecos.fws.gov/docs/five_year_review/doc3216.pdf. Accessed July 11, 2013.

¹²⁰ USFWS. *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area*, September 30, 1998. Available online at: http://ecos.fws.gov/docs/recovery_plan/980930c_v2.pdf. Accessed July 11, 2013.

¹²¹ Michael Wood, California Native Plant Society (CNPS), Yerba Buena Chapter. *Focus on Rarities (from the quarterly Yerba Buena Chapter Newsletter)*, San Francisco Bay spineflower, September 1997. Available online at: http://www.cnps-yerbabuena.org/experience/focus_on_rarities.html#pageTop. Accessed July 11, 2013.

¹²² CDFG. *Natural Diversity Database. Chorizanthe cuspidata var. cuspidata, San Francisco Bay spineflower*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

Federal Status

FE = Endangered. Species in danger of extinction throughout all or a significant portion of its range.

FT = Threatened. Species likely to become endangered within foreseeable future throughout all or a significant portion of its range.

California State Status

SE = Endangered. Species whose continued existence in California is jeopardized.

SSC = Species of Special Concern

SFP = State Fully Protected under Sections 3511 and 4700 of the Fish and Game Code.

SA = Special Animal

California Native Plant Society

1A = Plants presumed extirpated in California

1B = Plants that are rare, threatened, or endangered in California and elsewhere

2A = Plants presumed extirpated in California, but more common elsewhere

2B = Plants rare, threatened, or endangered in California, but more common elsewhere

3 = Plants about which more information is needed

4 = Plants of limited distribution (a watch list)

LS = Locally Significant

Occurrence

P = Potential

C = Confirmed

U = Unlikely

This space intentionally left blank

The following provides a description of the biology of special-status species that are known to occur on the project site or in its vicinity.

San Francisco Garter Snake

SFGS was listed as an endangered species under the FESA on March 11, 1967 and was listed as endangered by the State of California in 1971. SFGS is a fully protected species under California law. Historically, SFGSs occurred in scattered wetland areas on the San Francisco Peninsula from approximately the San Francisco County line south along the eastern and western bases of the Santa Cruz Mountains, at least to the Upper Crystal Springs Reservoir, and along the coast south to Año Nuevo Point in San Mateo County, and Waddell Creek in Santa Cruz County, California. Currently, the species has been reduced to only six significant populations in San Mateo County and northern Santa Cruz County. These sites include Pescadero Marsh, Año Nuevo, the San Francisco State Fish and Game Refuge, San Francisco Airport/Milbrae, Sharp Park Golf Course at Laguna Salada, and Cascade Ranch. There are two significant components to SFGS habitat, which include: 1) ponds that support CRLF and Pacific tree frogs; and 2) surrounding upland habitat that supports burrowing mammals such as Botta's pocket gopher and California vole. The preferred habitat of SFGS is vegetated ponds with an open water component near open hillsides where they can sun themselves, feed, and find cover in rodent burrows. SFGS avoids brackish marsh areas because their preferred prey base, primarily CRLF and Pacific tree frogs, have low tolerance to saline conditions. Adult SFGS sometimes overwinters and aestivates (passes the summer in a state of torpor) in rodent burrows during summer months when the ponds are dry. Mating occurs during both the spring and fall, but principally during the first few warm days of March.¹²³

California Red-legged Frog

CRLF is a federally listed threatened species and California SSC. CRLF was listed as a threatened species on May 23, 1996. A Recovery Plan was published for CRLF on September 12, 2002. The historic range of CRLF extended from the vicinity of Elk Creek in Mendocino County, California, along the coast inland to the vicinity of Redding in Shasta County, California, and southward to northwestern Baja California, Mexico. CRLF predominately inhabits permanent water sources such as streams, lakes, marshes, natural and manmade ponds, and ephemeral drainages in valley bottoms and foothills up to 4,921 feet in elevation. They also inhabit ephemeral creeks, drainages, and ponds with minimal riparian and emergent vegetation. CRLF breeds from November to April, although earlier breeding records have been reported in southern localities. Breeding generally occurs in still or slow-moving water often associated with emergent vegetation, such as cattails, tules or overhanging willows. Sheltering habitat for CRLF potentially includes all aquatic, riparian, and upland areas within the range of the species and includes any landscape feature that provides cover, such as animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. CRLF does not have a distinct breeding migration. Dispersal distances are typically less than 0.5 miles, with a few individuals moving up to 1 to 2 miles.^{124,125}

Western Pond Turtle

While the federal government does not list WPT, WPT is a California SSC. Historically, this species was relatively continuously distributed in most Pacific slope drainages, from Klickitat County, Washington, along the Columbia River to northern Baja California, Mexico. In

¹²³ USFWS. *Biological Opinion*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹²⁴ CDFG. *Amphibian and Reptile Species of Special Concern in California*, 1994. Available online at: http://www.dfg.ca.gov/wildlife/nongame/publications/docs/herp_ssc.pdf. Accessed April 9, 2013.

¹²⁵ USFWS. *Biological Opinion*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

California, it was historically present in most Pacific slope drainages between the Oregon and Mexican borders. WPT requires still or slow water. This aquatic turtle usually leaves the aquatic site to reproduce and aestivates, and overwinters. WPT may overwinter on land or in water, or they may remain active in water during the winter. Mating typically occurs in late April or early May, but may occur year-round.¹²⁶

Salt Marsh Common Yellowthroat

The salt marsh common yellowthroat is one of 12 subspecies of the common yellowthroat recognized north of Mexico, and is listed as a California SSC. This subspecies is in decline due to loss of wetlands. The salt marsh common yellowthroat feeds on invertebrates and seeds, and is known as one of the three most frequent hosts of the cowbird, which lays its own eggs in the nests of other bird species.¹²⁷

Black-crowned Night Heron

The black-crowned night heron is designated as a Special Animal by the CDFW. This bird species is a fairly common year-long resident of the foothills and lowlands throughout most of California. Nesting takes place in thick-foliaged trees, dense fresh or brackish emergent wetlands, or dense shrubbery or vines near aquatic feeding areas. The black-crowned night heron feeds primarily at night. Foraging is conducted largely along the margins of lacustrine, riverine, and fresh and saline emergent wetlands.¹²⁸

San Francisco Dusky-footed Woodrat

The San Francisco dusky-footed woodrat occurs in a variety of woodland and scrub habitats throughout the South Bay and the adjacent central coast range, south to the Pajaro River in Monterey County. Woodrats prefer riparian and oak woodland forests with dense understory cover or thick chaparral habitat. Dusky-footed woodrats build large, complex nests of sticks and other woody debris, which may be maintained by a series of occupants for several years. Woodrats are also very adept at making use of human-made structures and can nest in electrical boxes, pipes, wooden pallets, and even portable storage containers. While the San Francisco dusky-footed woodrat is described as a generalist omnivore, individuals may specialize on local plants that are available for forage. The breeding season for dusky-footed woodrats begins in February and sometimes continues through September, with females bearing a single brood of one to four young per year.¹²⁹

Migratory Fish and Birds

Some small fish species, such as sculpin, have been observed in LS and HSP. Other species such as mosquitofish may also occur. Many migratory birds use some areas of Sharp Park for foraging, nesting, and perching habitat.

Wildlife Corridors

Sharp Park is bordered in part by undeveloped areas, including Sweeney and Milagra Ridges, which allows it to serve as a relatively undisturbed corridor for wildlife, particularly birds. Sharp Park's connectivity to high-quality natural habitats also allows it to support medium size and

¹²⁶ Swaim Biological Incorporated. *Sharp Park Wildlife Surveys*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹²⁷ Ibid.

¹²⁸ CDFW. *Stanislaus River Report, Black-crowned Night Heron*. Available online at: <http://www.dfg.ca.gov/delta/reports/stanriver/sr437.asp>. Accessed July 11, 2013.

¹²⁹ H. T. Harvey & Associates. *Junipero Serra Traffic Calming Project Biological Resources Project, Project No. 3283-01*, September 26, 2011. This document is available for review as part of Case File No. 2012.1247E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

large mammals, including numerous general wildlife species, such as the black-tailed deer, bobcat, common porcupine, coyote, and mountain lion.

Native Wildlife Nursery Sites

Many areas in Sharp Park support potential or confirmed native bird nesting habitat and potential breeding habitat for other wildlife species. Native birds that may nest within this portion of Sharp Park include waterbirds, songbirds, and raptors and include such habitats as wetlands, grasslands, riparian scrub, and coastal scrub.

Habitat Types

Several different types of wetlands are present within Sharp Park, such as free-flowing creeks, open water, wet meadow, willow scrub, and fresh-to-brackish water marsh. Habitat types within or adjacent to the project area include coastal scrub, non-native grasslands, and wetlands. The area in which the proposed pond would be constructed is generally characterized as coastal scrub. The areas near the former rifle range site on the east side of PCH are generally covered with non-native grasslands.

Areas that meet the USACE criteria for wetlands or other waters of the U.S. may be protected under Section 1600 of the California Fish and Game Code and thus may be regulated by the CDFW. In addition, these areas are considered wetlands and thus are protected under the CCA. The USEPA and USACE assert jurisdiction over the following waters:¹³⁰

- Traditional navigable waters;
- Wetlands next to traditional navigable waters;
- Nonnavigable tributaries of traditional navigable waters that are relatively permanent, where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); or
- Wetlands that directly abut the tributaries described in the previous bullet.

Under the CCA, an area is classified as a wetland if it meets only one of the three parameters required by Section 404 of the FCWA definition of a wetland: hydric soils, hydrophytic vegetation, or wetland hydrology.¹³¹ Some wetlands may also meet criteria as “waters of the state” and be regulated by the SFBRWQCB.

In November 2008 a wetland delineation report was prepared for the LS wetland complex. Most of the wetlands delineated were characterized as freshwater marsh (19.56 acres), followed by wet meadow (2.44 acres) and willow scrub (0.93 acres).¹³² These areas meet the USACE criteria for classification as wetlands. The unvegetated open water (4.49 acres) meets the USACE criteria for “other waters of the U.S.,” due to the presence of an ordinary high water mark. In March 2009, the USACE confirmed this wetland delineation report.¹³³ All of these wetlands also meet the CCA criteria.

¹³⁰ USACE. *Revised Guidance on Clean Water Act Jurisdiction Following the Supreme Court Decision in Rapanos v. U.S. and Carabell v. U.S.*, December 2, 2008. Available online at: <http://www.usace.army.mil/missions/civilworks/regulatoryprogramandpermits/relatedresources/cwaguidance.aspx>. Accessed May 17, 2013.

¹³¹ USACE. *Corps of Engineers Wetland Delineation Manual*, January 1987. Available online at: <http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf>. Accessed May 17, 2013.

¹³² Tetra Tech, Inc. *LS Wetland Determination Report*. This report is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹³³ USACE. *Letter to Ms. Kelly Bayer, Tetra Tech, Inc., Subject: File Number 2009-00044S*, March 9, 2009. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

Another wetland delineation report was prepared in May 2013 that evaluated wetlands located within the proposed project area that meet the CCA-only criteria.¹³⁴ The May 2013 wetland delineation report found that the proposed project would not affect any CCA-only wetlands. The acreage of each jurisdictional habitat type within the LS wetland complex is shown in Table 5, below.

Table 5. Wetland Habitat Types in LS Wetland Complex^{135,136}

Habitat Type	Determination	Jurisdiction	Area (Acres)
Freshwater marsh	Wetlands	USACE/CCA	19.56
Willow scrub	Wetlands	USACE/CCA	0.93
Wet meadow	Wetlands	USACE/CCA	2.44
Unvegetated pond	Other Waters of the U.S.	USACE/CCA	4.49
Total wetlands/waters			27.46

Project Impacts

USFWS's Biological Opinion

A Biological Assessment was prepared by the SFRPD for the proposed project to facilitate a consultation, pursuant to Section 7 of the FESA.¹³⁷ Based on this Biological Assessment, the USACE's October 25, 2011 request for the initiation of formal consultation with the USFWS, numerous phone calls and emails between the SFRPD and USFWS, and other information available to the USFWS, the USFWS prepared and issued a Biological Opinion regarding this project under the authority of the FESA.¹³⁸ The Biological Opinion describes the proposed project,¹³⁹ evaluates the potential effect of the proposed project on CRLF and SFGS, and identifies Conservation Measures that would reduce impacts to federally-listed species.¹⁴⁰ The Biological

¹³⁴ SFRPD. *Single Parameter Wetland Delineation Report*. This document is available for as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹³⁵ Tetra Tech, Inc. *LS Wetland Determination Report*. This report is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹³⁶ SFRPD. *Single Parameter Wetland Delineation Report*. This document is available for as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹³⁷ SFRPD. *Biological Assessment*. This Biological Assessment was amended on August 16, 2012. These documents are available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹³⁸ USFWS. *Biological Opinion*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹³⁹ The proposed project is part of the project for which the Biological Opinion was issued by the USFWS. The proposed project, except for the construction of a 1,600-sf pond, is outlined under "Construction Action" on pages 5 and 6 of the Biological Opinion. The proposed construction of a 1,600-sf pond is outlined under "Conservation Measures for Golf Course Maintenance and Operations" on page 19 of the Biological Opinion.

¹⁴⁰ The Biological Opinion issued by the USFWS included the proposed project, as well as the ongoing operations and maintenance of the golf course. Although ongoing golf course operations and maintenance activities, such as pump

Opinion concluded that the proposed project would not be likely to jeopardize the continued existence of the CRLF or SFGS based on the Conservation Measures to be implemented as part of the project. These Conservation Measures are intended to minimize the likelihood or potential for take of individual CRLF and SFGS.

An Incidental Take Statement is also included in the Biological Opinion.¹⁴¹ The Incidental Take Statement provides the maximum amount of incidental take of CRLF and SFGS anticipated for the proposed project, effects of the take, and terms and conditions related to the Incidental Take Statement. The proposed project is subject to these Terms and Conditions. According to the Incidental Take Statement, the USFWS anticipates, even with implementation of the Conservation Measures as outlined on pages 11 through 13 of the Biological Opinion, that:

- 1) All CRLF in the 0.624-acre area¹⁴² within the HSP construction site will be subject to incidental take in the form of harassment and capture;
- 2) In total one CRLF adult will be subject to incidental take in the form of death or injury as a result of construction activities;¹⁴³
- 3) All SFGS in the 0.624-acre construction area will potentially be harassed as a result of ground disturbing activities, and take of this species is expected to be in the form of harassment and no SFGS is expected to be killed or injured as a result of construction activities; and
- 4) All SFGS and CRLF in the restoration¹⁴⁴ area footprint will be subject to incidental take in the form of harassment as a result of the direct effects of removal of plants, revegetation activities, and other activities associated with pond construction.

Impact BIO-1: The proposed project would not conflict with an adopted habitat conservation plan or natural community plan. (Less than Significant)

The only adopted conservation or management plan applicable to Sharp Park is the 1995 SNRAMP. The proposed 2006 SNRAMP is currently under environmental review and has not yet been adopted. As discussed in Section C, Compatibility with Existing Zoning and Plans, the project would not conflict with the 1995 or the proposed 2006 SNRAMP. Therefore, this impact is less than significant.

management and operation, mowing, and golf cart use, are discussed in the Biological Opinion, these ongoing operations and maintenance activities are not considered part of the proposed project for purposes of this CEQA analysis, but rather are considered part of the existing, or baseline, conditions.

¹⁴¹ "Incidental Take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the FESA provided that such taking is in compliance with the Incidental Take Statement.

¹⁴² The 0.624-acre area includes the areas where the "Construction Activities" would take place. "Construction Activities" in the Biological Opinion include all of the elements of the proposed improvements to the pumphouse (construction of steps and a maintenance walkway and replacement of the existing wooden retaining wall), removal of sediment and emergent vegetation in HSP and the connecting channel, and realignment of the existing golf cart paths.

¹⁴³ "Construction Activities" in the Biological Opinion include all of the elements of the proposed improvements to the pumphouse (construction of steps and a maintenance walkway and replacement of the existing wooden retaining wall), removal of sediment and emergent vegetation in HSP and the connecting channel, realignment of the existing golf cart paths.

¹⁴⁴ "Restoration" includes the proposed creation of a perennial pond per Conservation Measure 32 of the Biological Opinion and the restoration of one half acre of upland habitat per Conservation Measure 29 of the Biological Opinion. See page 37 of the Biological Opinion for more information. A Categorical Exemption (Planning Case No. 2013.1008E) was issued on August 5, 2013 concerning the restoration of one half acre of upland habitat.

Impact BIO-2: The proposed project could have a substantial adverse effect, either directly or through habitat modifications, on special-status species. (Less than Significant with Mitigation)

The proposed project includes improvements to existing facilities and enhancement and creation of habitat for CRLF and SFGS. The project's potential impacts to each of the special-status species that are known or have the potential to occur at the project site are addressed below.

California Red-legged Frog and San Francisco Garter Snake

Potential effects of the proposed project to CRLF and SFGS are addressed in the Biological Opinion prepared by the USFWS.¹⁴⁵ The jeopardy analysis in the Biological Opinion relies on four components: 1) the status of the species, which evaluates CRLF's and SFGS's range-wide conditions, the factors responsible for that condition, and their survival and recovery needs; 2) the environmental baseline, which evaluates the condition of these species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of these species; 3) the effects and action, which determines the direct and indirect effects of the proposed federal action and the effects of any interrelated or interdependent activities on these species; and 4) cumulative effects, which evaluate the effects of future, non-federal activities in the action area on them.

The Biological Opinion noted that because CRLF and SFGS have been observed throughout the project site, the effects of the construction activities to wetland and upland habitat and to individual CRLF and SFGS will be throughout the 0.624-acre construction footprint. Injury, exposure disorientation and disruption of normal behaviors will likely result from: 1) excavation of sediments and vegetation as part of the golf cart path realignments; 2) the removal and/or disturbance of vegetation, sediments, and cover sites including animal burrows, boulders of rocks, organic debris such as downed trees or logs in HSP and the connecting channel; 3) construction of a maintenance walkway around the pumphouse at HSP; and 4) soil disturbance and fill associated with replacement of the wooden retaining wall with a concrete retaining wall at HSP. Construction noise, vibration, and increased human activity during the construction may interfere with normal behaviors such as feeding, sheltering, movement between refugia and foraging grounds, and other essential behaviors. This can result in avoidance of areas that have suitable habitat and can cause disturbance to the species. Direct effects may include injury or mortality from being crushed by earth moving equipment, construction debris, and worker foot traffic. Work activities, including noise and vibration, may result in adverse effects to CRLF and SFGS by causing them to leave the work area. This disturbance may increase the potential for predation and desiccation.

The Biological Opinion further states that, as demonstrated at Mori Point, the proposed creation of a pond can benefit CRLF and SFGS and that the proposed removal of emergent vegetation (cattails and bulrush) would improve breeding habitat for CRLF. Although ultimately serving as a long-term conservation measure for CRLF and SFGS, these activities may also result in adverse effects to both species during construction. Short-term direct and indirect adverse effects to CRLF and SFGS are likely to be minimized, provided that the SFRPD constructs the pond following the scope and design of the existing GGNRA ponds at Mori Point.

The Biological Opinion concluded that the proposed project would not be likely to jeopardize the continued existence of the CRLF or SFGS with implementation of conservation measures

¹⁴⁵ USFWS. *Biological Opinion*, Pages 30 through 32, 37, and 38. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

included in the Biological Opinion. These conservation measures, along with the applicable Terms and Conditions included in the Incidental Take Statement, would minimize the likelihood of potential for take of individual CRLF and SFGS and are included in **Mitigation Measure M-BIO-2a**, as outlined below.¹⁴⁶

The proposed project would also be subject to the Terms and Conditions related to the Incidental Take Statement issued by the USFWS for this project. To be exempt from the prohibitions of Section 9 of the FESA, the USACE and the SFRPD shall ensure compliance with these Terms and Conditions. The Terms and Conditions include measures intended to minimize the impact of incidental take on CRLF and SFGS.

The measures included in the Terms and Conditions in the Biological Opinion that are applicable to the proposed project are incorporated in **Mitigation Measure M-BIO-2a**, as outlined below.

Mitigation Measure M-BIO-2a - Protection of CRLF, SFGS, and WPT

1. All sensitive habitats outside the construction site shall be avoided during and following project implementation. All biologists working on the project and their roles shall be approved by the USFWS and CDFW¹⁴⁷ based on their qualifications. All approved biologists shall be part of the Project Implementation Team. The SFRPD shall designate one of the USFWS/CDFW-approved biologists to oversee and coordinate all avoidance and survey tasks of the Project Implementation Team. Prior to the commencement of any project-related construction activity, an approved biological monitor shall flag the sensitive areas and/or the limits of the construction site with suitable markers that are easily discernible by construction equipment operators. No construction equipment or personnel shall enter the sensitive areas designated for avoidance by the project;
2. The lead USFWS/CDFW-approved biological monitor shall be present at all planning meetings prior to project implementation. A USFWS/CDFW-approved biological monitor shall present an educational program at one or more such meetings regarding the listed species and their habitats. Every person who works on project implementation shall receive this education program and sign a form indicating they have attended and agree to abide by the terms and conditions being implemented to avoid take of listed species and/or habitat. A USFWS/CDFW-approved biological monitor shall be present at the site during all construction activities including, but not limited to, vegetation and sediment removal, placement of concrete support structures for the walkway, replacement of the retaining wall and pathway repair. The biological monitor shall have the authority to stop work temporarily in order to protect the listed species or the flagged sensitive areas;
3. Prior to commencement of any construction activities and daily prior to construction each day, a USFWS/CDFW-approved biological monitor shall survey the site for listed species. A USFWS/CDFW-approved biologist shall also oversee the installation of exclusion fencing in segments or fully enclosing components of the construction site as appropriate. The biological monitor shall inspect the integrity of the exclusion fencing on a daily basis;
4. During the proposed sediment and vegetation removal activities, if required, up to three biological monitors shall be present to: 1) monitor the area of vegetation or sediment

¹⁴⁶ The conservation measures in the Biological Opinion have been modified to include measures to protect WPT and included in Mitigation Measure M-BIO-2a.

¹⁴⁷ Formally known as CDFG

- removal; 2) observe the material as it is transferred to the shoreline; and 3) inspect material as it is loaded into a container/dump bed that will allow the water in the excavated sediment to drain out before removal from the site;
5. Biological monitors shall complete a daily monitoring log that records information on compliance and construction activities as well as avoidance measures implemented each day during the project. Each monitor shall submit a daily monitoring report from to the lead biologist before the start of the next construction day. Photographic documentation of project activities shall accompany each daily monitoring log. Within 60 days of completion of the project, the SFRPD shall submit a report to the USFWS and CDFW documenting compliance with the terms and conditions and avoidance of unauthorized take of species or habitat;
 6. No earthmoving or soil disturbing work shall occur starting October 31 and ending June 1, the breeding season for CRLF and the season when SFGS are less active on the site;
 7. Terrestrial vegetation in undisturbed areas around HSP and the connecting channel shall be cleared by manual means to a height of four inches (or a height that allows visibility of the ground) under the supervision of an approved biological monitor and checked for the presence of CRLF, SFGS, and WPT;
 8. Prior to ground disturbing activities associated with construction, including the use of staging or vehicle access areas or the removal or placement of fill or construction materials, rodent burrows in the construction site shall be hand excavated by a USFWS/CDFW-approved biologist until the burrow terminates or until a maximum depth of 30 centimeters;
 9. Vehicle speeds in the project area shall not exceed 10 miles an hour. The USFWS/CDFW-approved biological monitor shall inspect for CRLF, SFGS, and WPT underneath any vehicle that is parked for 30 minutes or more prior to moving the vehicle. All construction personnel shall inspect under their tires and vehicle if it is in idle for more than five minutes and has not been inspected by the on-site monitor. Vehicles accessing the construction site shall be limited to the minimum necessary to complete the project. Project personnel shall park personal vehicles at a staging area located away from all aquatic habitats or areas of sensitive upland habitat;
 10. Any workers on the site that observe any frog, snake, or turtle shall immediately report their findings to the on-site biological monitor and immediately suspend work that may be harmful to the individual. The monitor shall identify the animal if it has not left the area. If a CRLF, SFGS, or WPT is observed in the work area, it shall be relocated by a USFWS/CDFW-approved biological monitor to the nearest suitable aquatic habitat out of harm's way. Work may only recommence if CRLF, SFGS, and WPT move out of harm's way or the animal is relocated by the biological monitor. Work may not recommence until the biological monitor has returned to the work area and gives approval;
 11. Only USFWS/CDFW-approved personnel shall be allowed to capture or attempt to capture and move CRLF, SFGS, WPT, or other non-listed wildlife (e.g., treefrogs, small rodents) in the work area;
 12. Erosion control best management practices (silt fences, coir rolls, straw bales) shall be employed as part of the dewatering of sediments after removal and while soils are exposed. The erosion control measures shall not include netting, plastic or natural monofilament netting or other materials that may entrap CRLF, SFGS, or WPT;

13. After completion of the project, the access routes in the wetland shall be revegetated with appropriate native plants and erosion control measures, as described in Measure 12, as outlined above, shall be installed on exposed soils with slopes of 3:1 or greater;
14. All construction activities shall occur in uplands and on the golf course. Stockpiling and staging areas shall be located in the uplands and in areas cleared for species and the golf course. Construction materials (bricks, boards, shoring, concrete forms, etc.) shall be elevated approximately four to six inches above ground to minimize the potential for species to take cover under these items. If feasible, materials shall be staged on a trailer/truck bed to avoid contact with the ground. Construction materials shall be brought to on-site staging areas as close to the time they are needed as possible;
15. The SFRPD shall minimize the potential for harm, harassment, injury, and death of federally listed wildlife species resulting from project-related activities including implementation of the Conservation Measures in the Biological Opinion;
16. If requested, during or upon completion of construction activities, the SFRPD shall ensure the USFWS, CDFW, or their authorized agents have immediate access to the project area. The on-site biologist and/or a representative from the USACE/SFRPD shall accompany USFWS personnel on an on-site inspection of the project area(s) to review project effects to CRLF and SFGS and their habitat;
17. The SFRPD shall ensure compliance with the Reporting Requirements of the Biological Opinion;
18. During the course of construction activities, biological monitors may determine that relocation of a CRLF or SFGS is necessary for the safety of individual animals. If it is determined that a SFGS needs to be moved, the USFWS shall be contacted for further guidance. Individuals shall be relocated to appropriate sites away from disturbance on Sharp Park property;
19. Within nine months of issuance of the Biological Opinion, the SFRPD shall develop, for the USFWS review and approval, a monitoring plan for the new perennial pond. The plan shall include monitoring of: 1) the use of the pond by all life stages of CRLF and SFGS, 2) the amount of emergent vegetation and open water available, and 3) how effective barriers are at preventing entry by people and off-leash dogs. If predators become established in the pond they shall be immediately removed and the USFWS shall be notified; and
20. Implementation of the pond monitoring plan shall begin immediately following the construction of the new pond.

In response to the Neighborhood Notice circulated on January 15, 2013, some of the commenters raised concerns related to impacts to CRLF and SFGS and their habitat resulting from acid sulfate soils being disturbed in the water during the proposed removal of sediment and emergent vegetation in HSP and the connecting channel and culverts that link HSP and LS. During implementation of sediment and vegetation removal work, sediment present at the bottom of the water would be disturbed, resulting in a temporary suspension of sediment in the water column. Although unlikely, these sediments may contain sulfides and other components which, once disturbed or suspended in the water column, could have adverse impacts to special-status species, their habitat, or water quality.

When exposed to dissolved or atmospheric oxygen, sulfides transform to sulfuric acid, which in turn results in the formation of acid sulfate soils. An increase in the amount of exposed acid sulfate soils in water bodies generally causes a decrease of the pH of water (an increase in acidity of the water) and a decrease in the amount of dissolved oxygen in the water, causing anoxic conditions¹⁴⁸ in which resuspension of anoxic hydrogen sulfide sediments may result in pulses of low oxygen conditions in HSP. This could cause mortality of CRLF larvae and juveniles.¹⁴⁹

Anoxic sediments containing sulfides have associated bacteria like *Thiobacillus* sp. that reduce sulfur. Bacterial respiration near the bottom of a waterbody can modify oxygen concentrations in overlying water causing some level of anoxia. When this condition occurs, the pH of the water begins to decline resulting in an acidic environment. Depletion of oxygen in the water column is mediated by the rate of photosynthesis during peak portions of a day. The degree to which water becomes acidified depends on the length of time that sulfides are suspended in the water column and the amount of sulfides in the water column. In general, the longer that sulfidic soils are suspended in the water column, the more chance there is for acidic conditions to occur. Even if acid sulfate soils are present, the suction hydraulic equipment could be used to minimize suspension of sediments relative to other sediment removal methods, and sulfides will settle out of the water column quickly. Therefore, anoxic conditions are expected to be localized and short-term. CRLF larvae and juveniles are likely to escape these small, short-lived anoxic zones as they dissipate with settling of the sediment and dilution by the pond.^{150,151}

The Biological Opinion¹⁵² issued by the USFWS concluded that the proposed project would not jeopardize the continued existence of the CRLF or SFGS with the implementation of the Conservation Measures included in the Biological Opinion, which limit the construction to June 1 through October 31 and include measures to protect species, such as pre-construction avoidance and survey tasks, site monitoring by USFWS/CDFW-approved biologists during construction activities, limitations on vehicle speeds in the project area, erosion control measures, and others. The Biological Opinion concluded that the Conservation Measures, which limit the construction period to June 1 through October 31, would minimize the likelihood that adult or juvenile CRLF would be present and would reduce potential adverse effects on CRLF.

A literature search indicates that very little research has been done on acid sulfate soils in the San Francisco Bay Area. One case in which acid sulfate soils have arisen as a concern is at the Bair Island tidal marsh restoration area, in Redwood City, California. In that case, the main concern was that sediments that had been excavated and stockpiled for re-use at the site contained

¹⁴⁸ "Anoxic condition" means a condition in which hydrogen ion availability increases and binds with sulfides mobilized from sediments.

¹⁴⁹ Harry Gibbons and Robert Plotnikoff, Tetra Tech, Inc. *Technical Memorandum, Revised Review of Acid Sulfate Soils, Potential Release Mechanism, and Risk of Release in the Horse Stable Pond and Connecting Channel Sediment Removal Project*. August 27, 2013 ("Acid Sulfate Soils Technical Memorandum"). This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁵⁰ Robert Plotnikoff, Tetra Tech, Inc. *Email to Stacy Bradley, SFRPD, Suggested Change to the MND*, December 3, 2013. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁵¹ Robert Plotnikoff, Tetra Tech, Inc. *Email to Alexis Ward, SFRPD and David Munro, Tetra Tech, Inc., Sharp Park*, December 30, 2013. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁵² USFWS. *Biological Opinion*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

sulfides that converted to sulfates as the sediments dried out. Re-use of these materials could result in acidic and hypoxic conditions. Since materials excavated at the LS wetlands complex would not be re-used as part of the project, hypoxic conditions would not result from re-use of dried sediments as part of the proposed project. Specific case studies of instances where acid sulfate soils effects have occurred in Bay Area restoration sites have not been identified.¹⁵³

Removal of sediment in the connecting channel between HSP and LS, similar to the proposed sediment removal, was reported to have occurred more than 10 years ago. At that time, no effects that would normally be associated with acid sulfate soils, including acidification of waters and sediment surfaces, were identified. At the time of the previous removal, it was reported that the bottom of HSP was lined with gravel. The previous sediment removal activity removed sediments that had accumulated after the seawall, which eliminated saline water input into the wetland complex, was constructed. Because the sediment to be removed as part of the proposed project is likely to have only accumulated since the last removal activity, it is unlikely that acid sulfate soils would exist in the excavated sediments. The construction of the seawall eliminated saline water input into the wetland complex. Sources of these sediments include input from the watershed during storms, as well as accumulated organic matter from dead and decaying vegetation in the watershed complex. This means that these sediments accumulated without the saline conditions that allow acid sulfate soils to form, and can be eliminated as a contributor to acid sulfate soils conditions.¹⁵⁴ This supports the conclusion that the proposed sediment and vegetation removal would not likely result in substantial disturbance of acid sulfate soils in the water column, which may in turn result in a significant impact to special-status species.

Environmental effects that may occur from excavating sediments in the presence of acid sulfate soils may include one or more of the following: 1) increase in sulfuric acid; 2) decline in pH; 3) increase in dissolved metal concentrations (aluminum, iron, and arsenic); and 4) increased incidence of hypoxia.¹⁵⁵ Any of the above effects could result in significant impacts (e.g., effects that could jeopardize the continued existence of a population of special-status species or effects to water quality beyond thresholds indicated in state or federal water quality standards) to special-status species or water quality. In order to ensure that hypoxic conditions do not materialize and to mitigate such conditions in the unlikely event that they do occur, **Mitigation Measure M-BIO-2b** as outlined below would be implemented by the SFRPD during construction to reduce the potential for adverse impacts to special-status species as a result of acid sulfate soils and other components. **Mitigation Measure M-BIO-2b** requires that sediment core sampling tests be conducted and specific remediation measures be implemented by the SFRPD if results of the sediment core sampling tests reveal the need for such remediation measures prior to commencement of any on-site work related to the removal of sediment and emergent vegetation in HSP or the connecting channel and culverts that link HSP and LS. **Mitigation Measure M-BIO-2b** requires that a toxics pathway analysis be conducted for potential risks and toxicities to species that may be affected by localized increases in acidity, hypoxia, or dissolved metals concentration should the potential for acid sulfate soils and anoxic conditions be present. This method for analyzing potential for bioaccumulation of toxics in the environment is a recommended approach for determining risk to wildlife and plants.¹⁵⁶ Pathway analysis is used to

¹⁵³ Harry Gibbons and Robert Plotnikoff, Tetra Tech, Inc. *Acid Sulfate Soils Technical Memorandum*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁵⁴ Harry Gibbons and Robert Plotnikoff, Tetra Tech, Inc. *Acid Sulfate Soils Technical Memorandum*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁵⁵ Ibid.

¹⁵⁶ USEPA. *Framework for Metals Risk Assessment*, EPA 120/R-07/001, March 2007. Available online at: <http://www.epa.gov/raf/metalsframework/pdfs/metals-risk-assessment-final.pdf>. Accessed July 17, 2013.

determine environmental conditions that would mobilize toxics and increase exposure that could have chronic or acute effects.

Mitigation Measure M-BIO-2b - Protection of Special-Status Species and Water Quality from Acid Sulfate Soils and Other Components

Prior to commencement of any on-site work related to the proposed removal of sediment and emergent vegetation in HSP or the connecting channel and culverts that link HSP and LS, sediment core sampling tests shall be conducted in the manner specified in this mitigation measure.

The result of the sediment core sampling tests and remediation measures recommended by a qualified SFRPD biological/hydrological consultant, if any, shall be submitted to the USFWS and CDFW for review and approval prior to commencement of any on-site remediation work or sediment/vegetation removal work at HSP or the connecting channel and culverts. If the USFWS or CDFW determines, based on the results of the sediment core sampling tests, that remediation measures are required, the SFRPD shall submit a remediation and monitoring plan to all applicable resource agencies for review and approval prior to implementation of the remediation measures. Copies of all correspondence with the resource agencies shall be submitted to the ERO for review. The sediment core sampling tests shall include the following elements:

1. Work Plan

A Work Plan for sediment core sampling tests shall be prepared by a qualified SFRPD biological/hydrological consultant and submitted to the USFWS and CDFW for review and comment prior to commencement of any on-site work related to the sampling tests. The Work Plan shall describe, at a minimum, compliance with ~~Item Tasks~~ 2 through 6 of this mitigation measure. Copies of all correspondence with the ~~resource~~resource responsible agencies shall be submitted to the ERO for review.

2. Sampling of Sediment Cores

The sampling test shall include collection of, at minimum, one sediment core from HSP, two from the connecting channel, and one from LS. The exact locations of sampling shall be determined pursuant to the work plan developed in accordance with ~~Item Task~~ 1, above. Sample sediment cores shall include the soils between the current surface sediment level and approximately two to three feet below the current surface. This depth shall be at least one foot below the proposed depth of the future sediment-water interface.

3. Analysis of Sediment Cores and Estimation of the Potential for Formation of Acid Sulfate Soils

The sediment cores shall be analyzed every five centimeters over the first 20 centimeters of core depth and then every 10 centimeters for the remainder of the core length for the following components: Total Organic Carbon (TOC), carbonate/bicarbonate, sulfate, sulfide, sulfites, pH, calcium, sodium, iron, aluminum, chloride, conductivity, redox potential, refractory organics, organic nitrogen, total phosphorus, ammonia, nitrate+nitrite nitrogen, soluble reactive phosphorus, organic phosphorus, loosely-sorbed phosphorus, iron-phosphorus, iron-phosphorus, aluminum-phosphorus, and calcium-phosphorus. Sediment core chemistry shall be analyzed to assess the potential reduction

of sulfate to form hydrogen sulfate, iron sulfides, and reduction buffering capacity relative to acid-neutralizing capacity.

In addition, sediment oxygen demand (SOD) in the sediment cores shall be measured. Results shall be compared to the total oxidizable organic material, which would be estimated from the difference of TOC and refractory organic carbon (labile carbon). These results shall be used in the analysis of potential for formation of anoxic conditions within the newly restored HSP and connecting channel.

Sediment cores shall be analyzed based on Toxicity Reference Values (TRVs) from the USEPA and Screening Quick Reference Tables (SQuiRT) from the NOAA.¹⁵⁷ A draft summary of potential toxics shall be provided to the USFW, CDFW, and ERO for review and, if needed, revision will be made to the toxicity ranges appropriate for use in analyzing the sediment cores.

The potential for formation of acid sulfate soils and anoxic conditions in the water column shall be estimated based on this analysis and in coordination with the USFWS and CDFW. If this analysis determines that acid sulfate soils could be present in this location, the SFRPD shall perform a toxic pathway analysis¹⁵⁸ to determine the appropriate remediation measures. The analysis results and determination shall be submitted to the USFWS, CDFW, and ERO for review.

4. Toxics Pathway Analysis

Should the potential for acid sulfate soils and anoxic conditions be present, a toxics pathway analysis shall be conducted for potential risks and toxicities to species that may be affected by localized increases in acidity, hypoxia, or dissolved metals concentration. During this Task, toxicity standards shall be established by the USFWS, CDFW, and ERO based on the results of ~~Item~~ Tasks 2 and 3 above, site-specific hydrologic conditions including water exchange and dissolved oxygen levels, the species that are known to be present, and literature review. The results of this task shall be submitted to the USFWS and CDFW and any applicable resource-responsible agencies for review and approval. Copies of all correspondence with the resource-responsible agencies shall be submitted to the ERO for review.

Should the results of the sediment core tests reveal that there has been an appreciable increase in the amount of nitrogen and related compounds in the sediment cores, any necessary measures to remediate such compounds shall be undertaken in accordance with Task 5, below. The SFRPD shall hire a qualified biological/hydrological consultant to prepare a remediation and monitoring plan which shall be submitted to the USFWS and CDFW for review and approval. Copies of all correspondence with the resource agencies shall be submitted to the ERO for review.

5. Remediation

If results of the sediment core chemistry analysis reveal the potential for reduction of sulfate to form hydrogen sulfate, iron sulfides, and its reduction in buffering capacity relative to acid-neutralizing capacity, or if the toxics pathway analysis indicates that their

¹⁵⁷ The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration. *SQuiRT Cards*. Available online at: <http://response.restoration.noaa.gov/cpr/sediment/squirt/squirt.html>. Accessed July 17, 2013.

¹⁵⁸ A toxics pathway analysis identifies potential risks and toxicities to species that may be affected by localized increases in acidity, hypoxia, or dissolved metals concentration.

presence could potentially result in substantial stress to special-status species, the SFRPD shall implement remediation measures, as approved by the USFWS and CDFW.

Remediation measures could include, but are not limited to:

- a. Addition of lime to neutralize any acid that exists or which may form during the sediment removal process;
- b. Injection of sodium nitrate to oxidize the sediments, thereby satisfying the sediment oxygen demand; or
- c. Use of suction hydraulic sediment removal that reduces re-suspension of any form of sediments.

Depending on the severity of the condition (e.g., hypoxia), the remediation measure selected for implementation would be the least intensive beginning with Item a, when signs of hypoxia are present, to the most intensive with Item c, when hypoxia is persistent and/or widespread. The SFRPD shall select the remediation measure in consultation with the USFWS and CDFW. The remediation measure shall be selected based on immediate threats to species and sensitive life stages present during occurrence of the hypoxic condition.

6. Monitoring

During sediment and vegetation removal in HSP and the connecting channel and culverts, pH levels immediately above the sediment shall be monitored by the SFRPD to ensure that implementation of the proposed project would not adversely affect special-status species.¹⁵⁹ To ensure that residual acid sulfates in the water column would not adversely impact special-status species, pH levels in HSP and the connecting channel shall be monitored by the SFRPD for a period of six weeks after the proposed sediment and vegetation removal is completed. A remediation measure, such as addition of lime or injection of sodium nitrate, shall be implemented if the monitoring warrants such a remediation measure to protect special-status species based on the toxicity standards that are established in accordance with Task 4 above.¹⁶⁰

To facilitate the proposed sediment and emergent vegetation removal and to reduce potential impacts to CRLF, the water level of HSP and the connecting channel may be lowered through the use of the existing pumps in consultation with the USFWS and CDFW. If water levels in HSP or LS fall below sea level and beach groundwater levels, then saline groundwater may flow into the lagoon from the beach.¹⁶¹ CRLF cannot breed when salinity levels exceed approximately four

¹⁵⁹ pH is an indicator of anoxic conditions at the sediment-surface water interface. Under anoxic conditions, hydrogen ion availability increases and binds with sulfides mobilized from sediments. Rates of transformation of sulfur are mediated by microorganisms in both the sediments and surface water. Suspension of hydrogen sulfide (H₂S) in the water column is oxidized in surface water to form sulfuric acid (H₂SO₄).

¹⁶⁰ David Munro, Tetra Tech, Inc. *Email to Stacy Bradley, SFRPD, Sharp Park Appeal: M-BIO-2b - Post Construction Monitoring*, January 7, 2014. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁶¹ USFWS. *Biological Opinion*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

parts per thousand (ppt).¹⁶² Although salinity levels may increase in HSP, the construction period would be short and would not correspond to the breeding season of CRLF. After construction is complete, winter storm runoff would result in substantial freshwater inputs to the wetland complex, causing any increased salinity levels to return to baseline levels. Therefore, the potential impacts to CRLF associated with increased salinity levels would be temporary and would occur outside the breeding season for CRLF, and would not be considered significant.

To facilitate the proposed sediment and emergent vegetation removal and to reduce potential impacts to CRLF, suction hydraulic equipment may be used in consultation with the USFWS and CDFW to minimize the disturbance of sediments in the water. While generally resulting in a higher percentage of water in the excavated materials than a clamshell dredge, the use of suction hydraulic equipment generally results in less turbidity and overall disturbance at the point of use than a clamshell. In sensitive environments, the use of suction hydraulic equipment is often preferred provided that the excavated materials and residual water are properly handled so they do not result in a significant impact on the environment. If suction hydraulic equipment is to be used as part of this project, the slurry that is created by suction hydraulic equipment would go into a settling area until the sediments settle out and the decant water can be tested for its acidity. If the result of such testing indicates that the water is pH neutral, it would either be released into HSP or pumped into the Pacific Ocean.^{163,164} Should any permit be required by the SFRWQCB for the discharge of the water into the Pacific Ocean as part of this project, the SFRPD will seek such a permit and comply with any conditions that may be attached to the permit. In light of the above, the use of suction hydraulic equipment as part of the proposed sediment and vegetation removal would not result in any significant impacts on the environment.

The Biological Opinion discusses the possibility of CRLF mortality through entrainment (individuals being pulled along with water and trapped against screening or pulled into the pumps) of egg masses and individual larvae at the pumps (see pages 33 and 34 in the Biological Opinion). The Biological Opinion further discusses the restoration actions and conservation measures that the SFRPD is committing to in order to reduce these effects and protect the species. The Biological Opinion concludes that this project, including the conservation measures, the uplands restoration work, and the continued operations and maintenance of the golf course, is not likely to jeopardize the continued existence of CRLF or SFGS. The conservation measures set forth in the Biological Opinion and incorporated into the project description and mitigation measures would reduce the adverse effects of the proposed construction and operations and maintenance activities on the survival and recovery of CRLF and SFGS. As a result, the proposed installation of secondary screen would not result in significant impacts to CRLF or SFGS.

Although construction activities could result in temporary impacts to CRLF and SFGS that are considered significant as discussed above, implementation of **Mitigation Measures M-BIO-2a** and **M-BIO-2b** would reduce the project's impacts to CRLF and SFGS to a less-than-significant level.

Western Pond Turtle

¹⁶² Swaim Biological Incorporated. *Sharp Park Wildlife Surveys*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁶³ David Munro, Tetra Tech. *Email to Stacy Bradley, SFRPD, Feedback on MND Appeal*, November 26, 2013. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁶⁴ David Munro, Tetra Tech. *Email to Stacy Bradley, SFRPD, Revised Text*, November 26, 2013. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

Impacts to WPT from the proposed project would be similar to those described above for CRLF. However, because the restoration activities would occur during the WPT nesting season, the magnitude of those impacts would be potentially greater for this species. Temporary impacts from construction activities would result in the disturbance of feeding, breeding, aestivation sites and dispersal behaviors. The removal of nonnative vegetation may disturb western pond turtles sheltering within the plants as well as remove basking sites along the wetland banks. Increased sedimentation could adversely affect shallow water habitat for hatchlings as well as basking sites along the banks. These effects of the proposed project would result in significant impacts to WPT.

Implementation of **Mitigation Measures M-BIO-2a** and **M-BIO-2b**, as outlined above, would reduce short-term impacts to WPT resulting from the proposed project to a less-than-significant level.

San Francisco Dusky-footed Woodrat

The San Francisco dusky-footed woodrat, which inhabits forests with moderate canopy and moderate to dense understory, is known to occur in the Upper Canyon at Sharp Park. As part of the proposed project, the sediment and vegetation removed from HSP and the connecting channel would be transported by trucks to a remediated former rifle range site on the east side of PCH. Habitat for the San Francisco dusky-footed woodrat occurs in the non-native forest and riparian areas surrounding the former rifle range site. Although habitat exists in the surrounding area, disposal of the sediment and vegetation would occur in the non-native grassland area, which is located well away from the San Francisco dusky-footed woodrat habitat. Therefore, there would be no impact to this species or its habitat. While additional truck trips would occur in the area, potentially resulting in greater noise, the area currently receives intermittent vehicular traffic and the level of additional noise and disturbance along with the distance between the disposal site and habitat for the San Francisco dusky-footed woodrat would not result in a significant impact on this species. Therefore, the proposed project would result in less-than-significant impacts to the San Francisco dusky-footed woodrat.

Salt Marsh Common Yellowthroat and Black-Crowned Night Heron

Construction activities associated with the proposed project could also result in the temporary disturbance to the salt marsh common yellowthroat from an increase in noise, vehicle traffic, and human presence. The salt marsh common yellowthroat uses saltwater or freshwater marsh habitat with dense vegetation for nesting, cover, and foraging. The proposed project may result in temporary impacts to this species through the disturbance and loss of nesting habitat from sediment and emergent vegetation removal activities. These impacts would be considered a significant impact. Similar temporary impacts to the black-crowned night heron could occur as a result of the proposed project. Implementing **Mitigation Measure M-BIO-2c** as outlined below, requires that all vegetation removal activities be conducted outside the breeding season for bird species (February 1 through August 31, as designated by the CDFW), unless a breeding bird survey is conducted prior to vegetation removal activities and determines that no nesting birds are present. If active nests (or large abandoned stick nests) are discovered as part of the breeding bird survey, a 150-foot-radius avoidance buffer would be centered on the nest sites to prevent the nesting birds from being disturbed by construction activities.

In addition, there would be permanent loss of some nesting habitat as vegetated areas are converted to open water. However, the overall area of fresh-to-brackish water marsh habitat that

would be removed represents approximately one percent¹⁶⁵ of the total habitat present in the LS wetland complex for these bird species. Furthermore, the fresh-to-brackish water marsh would likely re-establish through natural succession over time. Because the impact area represents a small portion of the total habitat in the LS wetland complex and ample habitat would remain in adjacent areas at Sharp Park, the proposed project would not result in a significant permanent impact to nesting and other habitat of the salt marsh common yellowthroat or black-crowned night heron.

With implementation of **Mitigation Measure M-BIO-2c**, the proposed project would result in less-than-significant impacts to the salt marsh common yellowthroat and black-crowned night heron.

Mitigation Measure M-BIO-2c - Protection of Bird Species

Vegetation removal activities shall be conducted outside the breeding season (February 1 to August 31), unless the following specific conditions are met: a breeding bird survey by a qualified biologist has been conducted prior to any vegetation removal activities. If active nests (or large abandoned stick nests) of a sensitive species are discovered, a 150-foot-radius avoidance buffer shall be centered on the nest site(s) to prevent nesting birds from being disturbed by power tools or other equipment. Weeds may be pulled by hand no closer than 50 feet from the nest.

Locally Significant Bird Species

As discussed above, a number of bird species, considered Species of Local Concern by the Golden Gate Audubon Society, breed or occur at Sharp Park. These bird species include: American goldfinch; American kestrel; band-tailed pigeon; black-crowned night heron; clark's grebe; gadwall; great horned owl; hairy woodpecker; hutton's vireo; pacific-slope flycatcher; pied-billed grebe; purple finch; red-shouldered hawk; red-tailed hawk; say's phoebe; steller's jay; swainson's thrush; tree swallow; and violet-green swallow. Some of these species primarily inhabit forests or woodlands. Nonetheless, all of these species or their nests could potentially be present in the project area.

Locally significant bird species including those listed above may occur in the project area or their habitat may be affected by the proposed project as a result of vegetation removal and an increase in noise, vehicle traffic, and human presence during construction activities. Impacts to locally significant bird species would be similar to those described above for the salt marsh common yellowthroat and black-crowned night heron. If nesting of locally significant bird species is present, in compliance with the MBTA, the SFRPD would be required to avoid damaging or removing the nests of any migratory bird species. Implementation of **Mitigation Measure M-BIO-2c** as outlined above, and compliance with the MBTA, would reduce the project's impacts on such bird species to a less-than-significant level.

Impact BIO-3: The project could interfere with the movement of native resident or migratory wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (Less than Significant with Mitigation)

¹⁶⁵ Based on the wetland delineation report prepared by Tetra Tech in November 2008, a total of approximately 19.56 acres (approximately 852,033 sf) of freshwater marsh were delineated in the LS wetland complex. Based on the wetland delineation report prepared by the SFRPD in May 2013, a total of approximately 8,612 sf of freshwater marsh would be permanently impacted by the proposed project. Therefore, the proposed project would permanently impact approximately one percent of the total freshwater marsh present in the LS wetland complex.

Migratory Corridors and Nursery Sites

Sharp Park is bordered in part by undeveloped areas, including Sweeney Ridge, Mori Point, and Milagra Ridge, which allows it to serve as a relatively undisturbed corridor for wildlife, particularly birds. No special-status fish are known to occur in LS, HSP, or the connecting channel. Many migratory birds use some areas of Sharp Park for foraging, nesting, and perching habitat.

The potential impacts on wildlife movement, migratory corridors, and nursery sites as a result of the proposed project would include the temporary disturbance from human presence as well as the disturbance of foraging and nesting habitat from vegetation removal and construction of the proposed pond. These activities may result in localized and temporary impacts to wildlife movement due to equipment and human presence and the amount of disturbance from earthmoving activities and removal of sediment and vegetation, which could be considered a significant impact. However, the proposed project would ultimately result in long-term beneficial impacts on wildlife movement by improving habitat quality for native species and allowing for greater habitat connectivity between Sharp Park and contiguous areas.

Implementation of **Mitigation Measures M-BIO-2a, M-BIO-2b, and M-BIO-2c** as outlined above and **M-BIO-4a** and **M-BIO-4b** as outlined below would minimize the potential temporary impacts to wildlife movement within the LS wetland complex by implementing protection measures to avoid and minimize impacts to special-status species as well as wetland and riparian areas. These measures require pre-construction surveys, worker education programs, biological monitoring, exclusion fencing, and consultation with the USFWS and CDFW. With implementation of **Mitigation Measures M-BIO-2a, M-BIO-2b, M-BIO-2c, M-BIO-4a, and M-BIO-4b**, the project's impacts on fish and wildlife movement, migratory corridors, and nursery sites would be less than significant.

Impact BIO-4: The proposed project would not have a substantial adverse effect on sensitive natural communities. (Less than Significant with Mitigation)

The sensitive natural communities present within the project site include coastal scrub, non-native grasslands, and wetland habitats.¹⁶⁶

Coastal Scrub and Non-native Grasslands

The proposed creation of a perennial pond would convert some of the areas currently characterized as coastal scrub with native and invasive species to open water wetland habitat for CRLF and SFGS. The areas surrounding the perennial pond would be replanted with native coastal scrub vegetation where appropriate. Removal of invasive vegetation is expected to result in an overall benefit to native coastal scrub habitat. As a result, this impact to the coastal scrub community would be less than significant.

No native grasslands would be affected by the proposed project. Sediment and emergent vegetation removed from HSP and the connecting channel would be transported to and spread at the former rifle range site on the east side of PCH. The former rifle range site is characterized by non-native grasslands, and therefore disposal of sediment and vegetation at this site would not affect native grasslands.

Wetlands and Waters of the U.S.

¹⁶⁶ Tetra Tech, Inc. *LS Wetland Determination Report*. This report is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

The project would result in a permanent impact to wetland habitat as a result of the construction of a maintenance walkway at the HSP pumphouse and replacement of the retaining wall. The support structures for the proposed maintenance walkway and replaced retaining wall would result in 1.2 CYs and 0.4 CYs, respectively, of permanent fill in wetlands and waters of the U.S.¹⁶⁷

As previously mentioned, a wetland delineation report was prepared in 2008 to delineate the USACE/CCC jurisdictional wetlands¹⁶⁸ in the LS wetland complex. In addition, the May 2013 wetland delineation report evaluates the proposed project's impacts to CCC-only wetlands located in the proposed project area as part of the requirements for the Coastal Development Permit required by the CCC for this project (see Figure 7).¹⁶⁹ Elements of the proposed project that may affect either the USACE/CCC jurisdictional wetlands and/or waters of the U.S. include:¹⁷⁰

- Removal of sediment and emergent vegetation (cattails and bulrush) within HSP and the connecting channel that links HSP and LS;
- Construction of a maintenance walkway; and
- Replacement of a wooden retaining wall with a concrete retaining wall at the pumphouse.

The May 2013 wetland delineation report concluded that no wetlands would be affected by the proposed construction of steps at the HSP pumphouse, construction of a 1,600-sf perennial pond, or realignment of a segment of the golf cart path segment.¹⁷¹ The area of each type of wetland or waters of the U.S. that would be permanently affected and created as part of the proposed project, and the area of each type of wetland that would be temporarily affected by the proposed project are shown in Tables 6 and 7, respectively, and discussed below.

The May 2013 wetland delineation report found that a total of 8,612 sf of freshwater marsh (USACE/CCA jurisdictional wetlands) would be permanently affected by the proposed sediment and emergent vegetation removal in HSP and the connecting channel, construction of a maintenance walkway at the pumphouse, and replacement of a retaining wall at the pumphouse. Of the 8,612 sf of affected freshwater marsh, 8,600 sf would be converted to open water wetlands as part of this project and 12 sf represents a permanent loss of wetlands that would result from the construction of the footings for the proposed walkway and replacement of the existing retaining wall at the pumphouse.

The proposed emergent vegetation (cattails and bulrush) removal would result in conversion of a portion of the existing vegetated wetland to open water habitat, consistent with historical conditions of the wetland complex which previously provided productive CRLF and SFGS habitat. Over the years, cattails and bulrush have encroached into the historically open water habitat, converting this habitat to freshwater marsh and/or wet meadow and limiting its value as breeding habitat for CRLF. Removing accumulated sediment and encroaching vegetation would reverse the effects of a trend that would eventually result in the conversion of the remaining open

¹⁶⁷ USFWS. *Biological Opinion*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁶⁸ See pages 59 and 60 of this Initial Study for the definitions of USACE/CCC jurisdictional wetlands.

¹⁶⁹ SFRPD. *Single Parameter Wetland Delineation Report*. This document is available for as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁷⁰ *Ibid.*

¹⁷¹ The May 2013 wetland delineation report included realignment of two golf cart path segments. The project has since been modified to realign only one golf cart path segment (north segment) and maintain the other golf cart path segment (south segment) at its current location. The May 2013 wetland delineation report identified that no wetlands would be affected by the proposed alignment of the north golf cart path segment.

water to vegetated wetland and ultimately conversion of those wetlands to upland. The proposed conversion of wetland to open water habitat would not result in a loss of waters of the U.S., and would be consistent with the historical conditions of wetland complex.

The proposed project includes construction of a new 1,600-sf perennial pond and would result in 8,600 sf of open water habitat in HSP. This means that a total of 10,200 sf of wetlands and/or waters of the U.S. would be created as part of this project. Therefore, the proposed project would result in a net increase of 1,588 sf of wetlands and/or waters of the U.S. within the project site, and would not result in a significant permanent impact to wetlands.

The proposed project would also temporarily affect a total of 3,700 sf of USACE/CCA jurisdictional wetlands and/or waters of the U.S. The 3,700 sf includes 3,000 sf of open water habitat, which would remain as open water habitat upon the completion of the proposed sediment and emergent vegetation removal in HSP, and 700 sf of freshwater marsh, which would be affected by the access areas required for the sediment and emergent removal activities in HSP. Most of these areas temporarily affected during construction would be protected by all applicable BMPs during construction and revegetated with native plant species upon the project completion. Nevertheless, these temporary impacts to wetlands could be considered significant. Implementation of **Mitigation Measures M-BIO-4a** and **M-BIO-4b**, as outlined below, would ensure that these temporary impacts would be reduced to a less-than-significant level.

As discussed in Impact BIO-2, temporary impacts to wetlands resulting from the proposed sediment and emergent vegetation removal in HSP and the connecting channel could include impacts due to the potential presence of acid sulfate soils or other components in HSP and the connecting channel or anoxic conditions potentially caused by the sediment removal activities. Implementation of **Mitigation Measure M-BIO-2b** would reduce these temporary impacts to a less-than-significant level.

This space intentionally left blank

Sharp Park, Pacifica, CA
 Figure 2: Elements related to construction

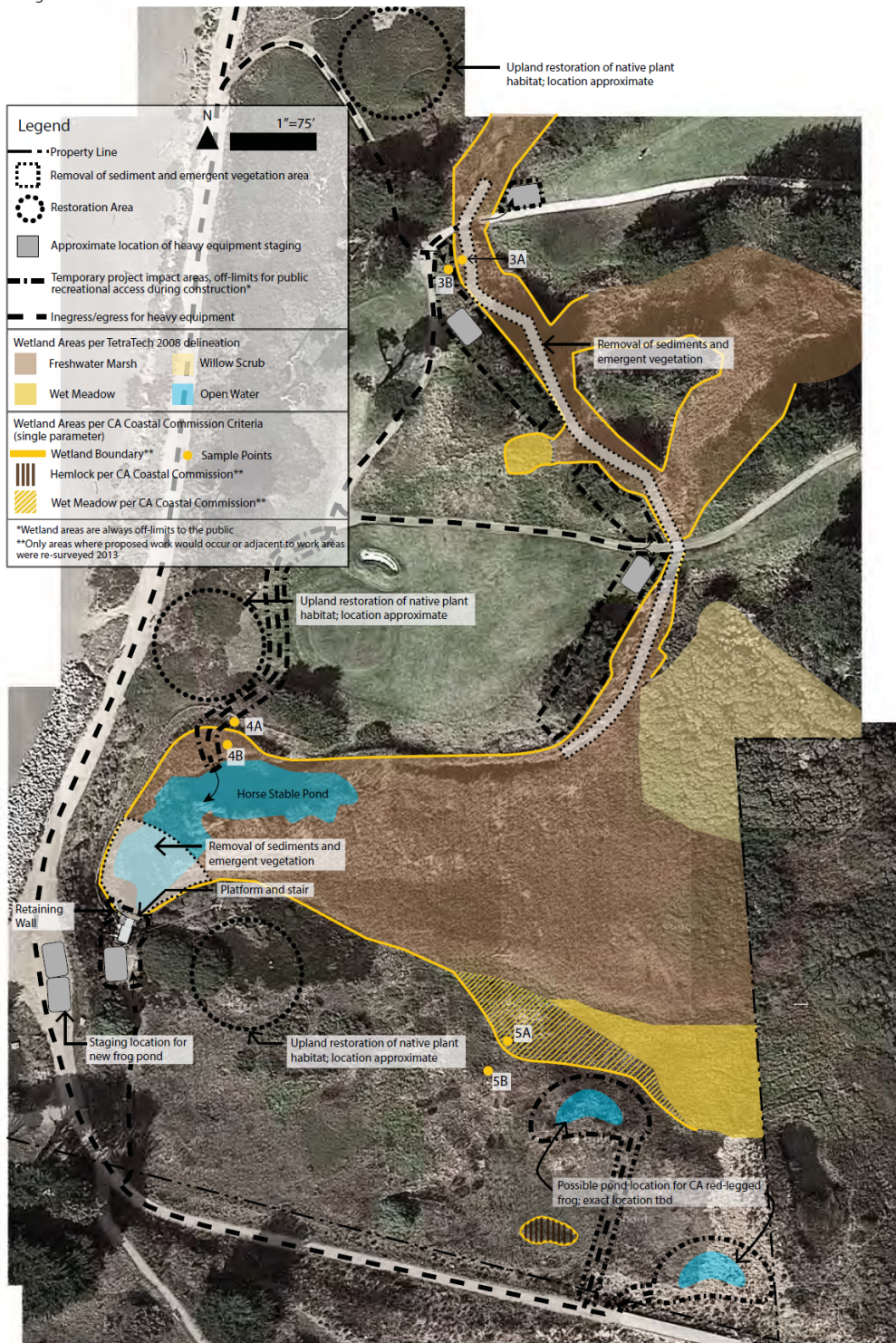


Figure 7. Affected Wetlands and Waters of the U.S. near HSP¹⁷²

Source: San Francisco Recreation and Park Department

¹⁷² SFRPD. *Single Parameter Wetland Delineation Report*. This document is available for as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

Table 6. Permanently Affected Wetlands and Waters of the U.S.¹⁷³

Affected Area - Permanent		Created (Post Construction) - Permanent	
Habitat Type	Area (square feet)	Habitat Type	Area (square feet)
Freshwater marsh	8,612	Open water	8,600
Total	8,612	Freshwater marsh / Open Water (new pond)	1,600
		Total	10,200
		Net Increase	1,588

Table 7. Temporarily Affected Wetlands and Waters of the U.S.¹⁷⁴

Affected Area - Temporary	
Habitat Type	Area (square feet)
Freshwater marsh	700
Open water	3,000
Total	3,700

¹⁷³ SFRPD. *Single Parameter Wetland Delineation Report*. This document is available for as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁷⁴ Ibid.

As discussed above, implementation of the project would result in temporary impacts to wetlands, which could be considered a significant impact. Implementation of **Mitigation Measures M-BIO-2b, M-BIO-4a, and M-BIO-4b** as outlined below would reduce these temporary impacts to a less-than-significant level. Prior to implementing the proposed project, the SFRPD would be required to obtain a Section 404 permit from the USACE, a Section 401 water quality certification from SFBRWQCB, a coastal development permit from the CCC, and a lake or streambed alteration agreement from the CDFW. These resource agencies may require measures to protect wetlands in addition to **Mitigation Measures M-BIO-4a and M-BIO-4b**.

Mitigation Measure M-BIO-4a - Protection of Wetlands and Natural Habitat

The SFRPD shall obtain all applicable permits from the SFBRWQCB, CCC, USACE, and CDFW to protect wetlands and natural habitat. Measures identified in these permits shall be applied, in addition to the following measures, unless otherwise specified by resource agencies:

1. In areas where work is not directly taking place, a minimum 100-foot buffer surrounding all wetlands, ponds, streams, drainages, and other aquatic habitats located on or within 100 feet of the project site shall be clearly designated on the final project construction plans and marked on the site with wildlife-friendly orange construction fencing or silt fencing. If the area is on a slope, silt fencing or other comparable management measures will be installed to prevent polluted runoff, as well as equipment, from entering the buffer area. Signs shall be installed every 100 feet on or adjacent to the buffer fence that read, "Environmentally Sensitive Area – Keep Out." Fencing and management measures shall be installed and inspected prior to project implementation and maintained throughout the restoration period. No equipment mobilization, grading, clearing, storage of equipment or machinery, vehicle or equipment washing, or similar activity, may occur until a representative of the SFRPD has inspected and approved the fencing and/or management measures installed around these features;
2. Vehicle and equipment operators shall use existing access roads and shall remain outside of wetlands and riparian areas that are not directly associated with the proposed project. Project construction and staging areas shall be delineated with construction fencing and shall avoid wetland habitat to the maximum extent feasible; and
3. All vehicles shall be brought in clean and free of weeds to prevent the spread or introduction of invasive plant species. Vehicles and equipment shall be fueled, maintained, and parked at least 100 feet from wetlands. Each morning, operators shall inspect all equipment that requires the use of fuel or fluids for leaks.

Mitigation Measure M-BIO-4b - Wetland Mitigation Plan for Temporarily Affected Areas

Consistent with the requirements for a Section 401 water quality certification permit, the SFRPD shall prepare a wetland mitigation plan for temporarily effected wetlands. Additionally, because the proposed project includes habitat restoration (i.e., construction of a perennial pond), the CCC may require an objective performance evaluation to determine project success which would include a monitoring program and methods for evaluating performance, which could be accomplished through implementation of the wetland mitigation plan. The wetland mitigation plan shall include, at a minimum, a description of the following:

- Proposed project's physical and biological impacts;
- Mitigation goals;

- Mitigation work plan;
- Management and maintenance plan;
- Success criteria and performance indicators;
- Monitoring plan; and
- Site protection measures.

The components of the above mitigation plan may be altered, supplemented, or deleted during the SFBRWQCB’s review process, as the SFBRWQCB has final authority over the terms of the water quality certification.

Impact C-BIO: The proposed project, combined with past, present, and reasonably foreseeable future projects in the vicinity, would not make a considerable contribution to any cumulative significant biological resources impacts. (Less than Significant with Mitigation)

The Draft EIR prepared for the proposed 2006 SNRAMP, a reasonably foreseeable future project in the proposed project’s vicinity, concluded that the proposed 2006 SNRAMP in combination with the GGNRA Dog Management Plan would result in a significant and unavoidable cumulative impact related to special-status plant and wildlife species. The Draft EIR for the proposed 2006 SNRAMP concluded that with mitigation measures the proposed 2006 SNRAMP would not result in any significant biological impacts. A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the environment, including biological resources impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.¹⁷⁵

As discussed above, the proposed project with identified mitigation would not result in any significant biological impacts. Therefore, the proposed project’s contribution to cumulative biological resources impacts would be reduced to less than significant with incorporation of **Mitigation Measures M-BIO-2a, M-BIO-2b, M-BIO-2c, M-BIO-4a, and M-BIO-4b.**

<u>Topics:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporated</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>	<u>Not Applicable</u>
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:					

¹⁷⁵ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
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.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Change substantially the topography or any unique geologic or physical features of the site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 14e would not be applicable because the project does not involve the use of any septic systems.

Impact GE-1: The proposed project would not result in exposure of people and structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, expansive soils, seismic ground-shaking, liquefaction, lateral spreading, or landslides. (No Impact)

The proposed project does not involve the construction of any residences or inhabitable structures. The proposed project would involve construction of minor structures such as steps and a maintenance walkway and replacement of an existing retaining wall near the existing pumphouse at HSP. All of these structures would be constructed in compliance with the California Uniform Building Code. The topography of the project site is relatively flat. The proposed project would not expose people or structures to substantial adverse effects involving the rupture of a known earthquake fault or strong seismic shaking. Ground rupture most commonly occurs along preexisting faults. No known active faults cross Sharp Park, and the project site is not within an Alquist-Priolo Earthquake Hazard Zone. While there is a potential for strong ground shaking at the project site due to a nearby earthquake fault line, the proposed project would not increase the likelihood that people or structures would experience adverse

effects from strong ground shaking. Therefore, no impact would result from the proposed project.

Impact GE-2: The proposed project would not result in substantial loss of topsoil or erosion. (Less than Significant)

The proposed project includes minor improvements to existing facilities and the creation of habitat in Sharp Park. Ground disturbance resulting from these construction activities can expose soils to erosion, resulting in a loss of topsoil. However, the magnitude of loss of topsoil or erosion is not expected to be substantial given the minor scope and nature of the proposed project. Therefore, this impact is less than significant. BMPs for erosion control would be implemented for all elements of the proposed project, such as installation of fiber rolls, silt fences, straw blankets, hydroseeding, and straw mulch/wood chips, and these measures would further ensure that the project would not result in a substantial loss of topsoil or erosion.

Impact GE-3: The proposed project would not result in substantial impacts to site topographical features. (Less than Significant)

The proposed project would not substantially change the topography of the project site. Unique geologic features generally include picturesque rock outcrops and some of the last remaining sand dune systems. While the proposed project includes construction of an approximately 1,600-sf pond, this would not be considered a significant change in the topography of the site given the size and depth (approximately 5 feet) of the pond. Therefore, the proposed project would not result in substantial impacts with respect to changes in topographical features at the project site. Therefore, this impact is less than significant.

Impact C-GE: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the site vicinity, would not make a considerable contribution to any cumulative significant impacts related to geology and soils. (Less than Significant)

Geology impacts are generally site-specific and do not have cumulative effects with other projects. There are no known past, present, or future projects that in combination with the proposed project could result in cumulatively significant impacts to geology or soil resources. Thus, the project would not contribute to a cumulative impact on geology or soils.

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
15. HYDROLOGY AND WATER QUALITY—					
Would the project:					
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Question 15g is not applicable to the proposed project because the project would not involve the construction of any residences or inhabitable structures.

Setting

Climate

The climate in the San Francisco Bay Area is generally characterized as a Mediterranean pattern of cool and mild temperatures along the coast, with higher temperatures inland, cool wet winters, and relatively warm dry summers. Pacifica receives an average of approximately 29.5 inches of precipitation a year, mostly between October and April. Average monthly temperatures range from 50.5 degrees Fahrenheit in January to 62.0 degrees in September.¹⁷⁶

Regional Hydrology

Pacifica is in the San Francisco Bay watershed, U.S. Geological Survey (USGS) hydrologic unit code 18050004. The California State Water Resources Control Board and the nine RWQCBs manage water quality in California and administer federal water pollution control laws. The state board administers water rights and water pollution control, while the RWQCBs conduct planning, permitting, and enforcement. Within this context, Pacifica is in the San Francisco Bay Basin, which is administered by the SFBRWQCB. The SFBRWQCB has developed a water quality control plan (Basin Plan) for the San Francisco Bay region, dividing the basin into several hydrologic planning areas. Most of San Francisco and Pacifica are in the San Mateo Coastal Hydrologic Planning Area.¹⁷⁷

Laguna Salada and Horse Stable Pond

The Sharp Park Golf Course is located within an 845-acre watershed.¹⁷⁸ HSP is located south of LS and consists of an open water pond and a freshwater wetland. It is connected to LS via an approximately 1,000-foot-long channel that was constructed to drain water from the lagoon to HSP, and together these three features form a wetland complex. In addition to water from LS, HSP receives water from Sanchez Creek from the east (see Figure 4). HSP is shallower and smaller than LS, and typical water depths range from one to three feet. Flood waters in the wetland complex are ~~drained~~removed by pumps at HSP, which pump water into the Pacific Ocean during the winter, when water levels in HSP become too high.

The LS wetland system is naturally maintained by groundwater during periods of low surface water inflow, such as during the summer. At these times, the water elevation in HSP and LS represents the groundwater table. Groundwater flow from the watershed to the ocean maintains the pond elevations above sea level. Over the course of the year, surface inflows to LS exceed groundwater inflows to LS by 600 percent. Some of the excess surface water inflow is lost to evaporation and uptake by plants, some flows as groundwater to the sea, and some is pumped to the ocean during periods of high inflow.¹⁷⁹

A hydrologic assessment report was prepared in 2009 for the SFRPD to improve the understanding of the hydrologic processes that affect the distribution of ecological habitats in the LS wetland system and flooding of the adjacent golf course.¹⁸⁰ The assessment characterized the variability of water level functions from year to year in the LS wetland system. Results from a water budget investigation reveal that the system is supplied with adequate water to fill HSP

¹⁷⁶ U.S. Climate Data, *Climate, Pacifica, California*. Available online at:

<http://www.usclimatedata.com/climate.php?location=USCA0822>. Accessed July 11, 2013.

¹⁷⁷ SFBRWQCB. *Basin Planning*. Available online at: http://www.waterboards.ca.gov/rwqcb2/basin_planning.shtml. Accessed July 22, 2013.

¹⁷⁸ USFWS. *Biological Opinion*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁷⁹ Kamman Hydrology & Engineering, Inc. *Hydrologic Assessment*. This report is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁸⁰ Ibid.

even in dry years. Variability of water levels in the wetlands from year to year is low due to the operation of the pumping station. Early spring water levels in the ponds are consistent among dry, normal, and wet water years because the water level is controlled by the pumping station. Dry season losses due to evapotranspiration and seepage do not likely vary much year to year. Surface water flows associated with winter storms provide the primary source of water into the wetland system. Groundwater inflow exceeds groundwater outflow (seepage); as a result, groundwater inflows contribute to the overall water budget of the system, and dry season water level recession occurs at a slightly slower rate than would be expected due to evapotranspiration losses alone.¹⁸¹

As part of the hydrological assessment, the seasonal variation of salinity in the wetland system was also monitored to characterize conditions and to assess potential impacts of saltwater encroachment. Salinity is a concern because of its potential to affect the survival of sensitive species that use this wetland habitat. During the monitoring period, salinity in HSP ranged between 0.7 and 2.5 ppt. Salinity in LS appears uniform and well mixed.¹⁸²

Flood Hazard Zones

Flood hazard zones in Sharp Park are identified in the Flood Insurance Rate Maps (FIRMs) published by the Federal Emergency Management Agency (FEMA) in 2012.^{183,184} The FIRMs identify LS, HSP, and the lower reach of Sanchez Creek (labeled as Sharp Park Creek in the FIRMs) as Zone A (areas with a 1-percent annual chance of flooding). A larger area that includes a portion of the golf course southeast of LS is identified as Zone X (areas of 0.2-percent annual chance flood; areas of 1-percent annual chance flood with average depth of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1-percent annual chance flood).

Sharp Park is subject to the CCSF Floodplain Management Program as outlined in San Francisco Administrative Code Sections 2A.280 through 2A.285.

Sea Level Rise

In 2006, the California Climate Change Center reported a historic sea-level rise of seven inches in the last century and projected an additional rise of 22–35 inches by the end of this century. Since that time numerous other studies have published projected ranges of 7–23 inches, 20–55 inches, and 32–79 inches of sea-level rise for this same period, with the differences in these projections attributable to different methodologies used and how well or whether glacier ice melt is included in the calculations.¹⁸⁵ Sea level rise could increase flooding potential in coastal areas. Sea level rise and climate change may also alter seasonal and long-term ocean levels and wave energy,

¹⁸¹ Ibid.

¹⁸² Ibid.

¹⁸³ Federal Emergency Management Agency (FEMA). *Flood Insurance Rate Map (FIRM), San Mateo County, California, and Incorporated Areas, Panel 38 of 510, Map Number 06081C0038E*, Effective Date October 16, 2012. This map is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁸⁴ FEMA. *Flood Insurance Rate Map (FIRM), San Mateo County, California, and Incorporated Areas, Panel 126 of 510, Map Number 06081C0126E*, Effective Date October 16, 2012. This map is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁸⁵ California Natural Resources Agency. *2009 California Climate Adaptation Strategy, A Report to the Governor of the State of California in Responses to Executive Order S-13-2008*. Available online at: http://resources.ca.gov/climate_adaptation/. Accessed July 13, 2013.

potentially reversing shallow groundwater gradients between the lagoon and ocean and allowing more sea water to migrate into the LS wetland complex.¹⁸⁶

Impact HY-1: The proposed project would not violate water quality standards or otherwise substantially degrade water quality. (Less than Significant with Mitigation)

The proposed construction activities would involve excavation up to five feet bgs. Excavation could release sediment and other constituents of soil into local water bodies, if uncontrolled, would result in significant water quality impacts. Best Management Practices (BMPs) for erosion control would be implemented for all elements of the proposed project, such as installation of fiber rolls, silt fences, straw blankets, hydroseeding, and straw mulch/wood chips. These BMPs would ensure that ground-disturbing activities associated with the proposed project would not result in a substantial increase in the amount of sediment in runoff from the site which may ultimately discharge to surface water bodies.

As discussed in Section E.13, Biological Resources, **Mitigation Measure M-BIO-4a** requires that the SFRPD obtain all applicable permits from the SFBRWQCB, CCC, USACE, and CDFW to protect wetlands and natural habitat. This would further ensure that impacts to wetland habitat and water quality would be reduced to a less-than-significant level. A post-construction monitoring program would also be designed and implemented, as described in **Mitigation Measure M-BIO-4b**, which would ensure that erosion control measures and revegetation efforts meet standards and success criteria as determined in consultation with the SFBRWQCB.

To facilitate the proposed sediment and emergent vegetation removal activities in HSP and the connecting channel and to reduce potential impacts to CRLF, the water level in HSP or the connecting channel may be lowered through the use of the existing pumps in consultation with the USFWS, CDFW, and/or SFBRWQCB. This would result in a temporary increase in the amount of water discharged to the Pacific Ocean during the project construction. ~~Discharge at Sharp Park is authorized under an existing NPDES permit issued to CCSF. The SFRPD would seek modification to the NPDES permit in consultation with the SFBRWQCB so that activities associated with the proposed project are reflected in the NPDES permit, if necessary. In addition, the SFRPD would seek an amendment to an existing Section 401 permit issued by the SFBRWQCB to reflect the proposed project, if required by the SFBRWQCB. No permit is required for discharges from Sharp Park's pumphouse into the Pacific Ocean because both the LS wetlands complex and the Pacific Ocean are considered "waters of the United States" under the FCWA. As such, as long as nothing is added to the water, no permit is required to discharge from one water of the U.S. to another. Should any permit be required by the SFBRWQCB for the proposed project, SFRPD will seek such a permit and comply with any conditions that may be attached to the permit.~~

During the implementation of the sediment and emergent vegetation removal activities, sediment present at the bottom of HSP and the connecting channel would be disturbed, resulting in a temporary suspension of sediment to the water column. Although unlikely, these sediments may contain sulfides and other components which, once disturbed or suspended in the water column, could have adverse impacts to special-status species, their habitat, or water quality. When exposed to dissolved or atmospheric oxygen, sulfides transform to sulfuric acid, which in turn results in the formation of acid sulfate soils. An increase in the amount of exposed acid sulfate soils in water bodies generally causes a decrease in the pH of water (an increase in acidity of the water) and a decrease in the amount of dissolved oxygen in the water, causing anoxic conditions

¹⁸⁶ Kamman Hydrology & Engineering, Inc. *Hydrologic Assessment*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

in which resuspension of anoxic hydrogen sulfide sediments may result in pulses of low oxygen conditions in HSP which could cause mortality of CRLF larvae and juveniles.¹⁸⁷ With implementation of **Mitigation Measure M-BIO-2b**, potential impacts to water quality resulting from acid sulfate soils, other chemical components, or anoxic conditions would be reduced to a less-than-significant level.

The proposed perennial pond, approximately 1,600 sf in area, would be constructed in consultation with USFWS, and all necessary permits from the CCC would be obtained. As of writing of this Initial Study, there are two potential locations for this pond. Both of them are located within Sharp Park, approximately 400 to 500 feet southeast of the existing pumphouse at HSP (see Figure 5). The water in the proposed pond would be supplied through surface water runoff and, depending on the location of the pond, through groundwater. Given the above, the proposed construction of the pond would result in a less-than-significant impact with respect to water quality.

In summary, with identified mitigation, the proposed project would not result in any significant water quality impacts.

Impact HY-2: The proposed project would not 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. (Less than Significant)

No groundwater would be used for the proposed project, except that the proposed 1,600-sf pond may be designed to be fed by groundwater. The pond would be constructed by excavating up to five feet bgs. The pond would occupy a small area and the overall topography and drainage patterns surrounding the pond site, which gently slopes toward HSP, would not be altered. The amount of water retained in the pond would not be substantial compared with the total amount of water present in the area watershed at a given moment. In addition, the proposed pond would capture some of the surface runoff water or groundwater that would otherwise flow into HSP as it would be constructed in an area located higher in elevation than HSP.

In light of the above, the project would not result in substantial depletion of groundwater supplies or interference with groundwater recharge, and this impact is less than significant.

Impact HY-3: The proposed project would not result in altered drainage patterns that would cause substantial erosion or flooding or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. (Less than Significant)

None of the proposed project activities would substantially increase impervious surfaces or would contribute runoff water that would exceed the capacity of an existing or planned stormwater drainage system. Therefore, the proposed project would have a less-than-significant impact with respect to the creation of, or the contribution to, runoff water.

The proposed project would not substantially alter drainage patterns on the project site or in its vicinity. As part of the proposed project, a 1,600-sf pond would be constructed to establish habitat for CRLF. This pond would be constructed by excavating upland habitat, and is expected to retain surface water runoff, which would reduce the potential for flooding. Given the above, the proposed pond would result in a less-than-significant impact with respect to altered drainage patterns or flooding.

¹⁸⁷ Harry Gibbons and Robert Plotnikoff, Tetra Tech, Inc. *Acid Sulfate Soils Technical Memorandum*. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

Impact HY-4: The proposed project would not expose people, housing, or structures, to substantial risk of loss due to flooding. (Less than Significant)

The golf course floods whenever the pumps at HSP are not able to keep up with the inflow from the watershed. Because the watershed east of PCH is much larger than the golf course, most of the runoff from the watershed drains via Sanchez Creek to HSP. As water levels rise in HSP, water flows through the connecting channel into LS.

The capacity of HSP and the connecting channel would be slightly increased as a result of the proposed sediment and emergent vegetation removal activities, but the increase in capacity would be small compared to the amount of runoff generated by a moderate to large storm. Therefore, changes to HSP and the connecting channel would not substantially alter the frequency of flooding, which is regulated primarily by the rate at which the pumps at HSP are able to discharge water to the ocean and by the intensity of rainfall in the watershed that governs the rate at which water is delivered to HSP via Sanchez Creek.

As part of the proposed project, steps and a maintenance walkway would be constructed and the existing retaining wall would be replaced at the HSP pumphouse. While these proposed structures would not be subject to building permit requirements of the City of Pacifica, San Francisco Department of Building Inspection (DBI), or any other agencies, the SFRPD would design and construct these structures in accordance with the California Uniform Building Code.

The existing pumphouse is located outside the Special Flood Hazard Areas (SFHAs), which are the areas subject to inundation by the 1-percent annual chance flood. The 1-percent annual chance flood (100-year flood), also known as the base flood, is a flood that has a one percent chance of being equaled or exceeded in any given year.¹⁸⁸ The water level at the pumphouse and to a lesser extent throughout the entire wetland system is determined by rainfall and management of the pumps. Water levels are managed in the rainy season to ensure the protection of the CRLF egg masses. Typically, water levels in the wetland complex rise throughout the winter as egg masses are deposited and the pumps are adjusted upwards. Sometimes large storm events exceed the capacity of the pumps and water backs up on the golf course, however, it is very unlikely that the pumphouse itself would become inundated by flooding.¹⁸⁹ Furthermore, the proposed structures would not impede the flow of floodwater in a way that increases the elevation of floodwaters upstream. Therefore, the proposed project would result in a less-than-significant impact with respect to flooding.

In light of the above, the proposed project would not expose people, housing, or structures, to substantial risk of loss due to flooding, and this impact is less than significant.

Impact HY-5: The proposed project would not expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow. (No Impact)

The proposed project would not attract a significant number of visitors to Sharp Park or result in construction of dwelling units. The proposed project would have a less-than-significant impact

¹⁸⁸ FEMA. *Flood Insurance Rate Map (FIRM), San Mateo County, California, and Incorporated Areas, Panel 126 of 510, Map Number 06081C0126E*, Effective Date October 16, 2012. This map is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁸⁹ Lisa Wayne, SFRPD. *Email to Kei Zushi, San Francisco Planning Department, FEMA 100-year flood map*, April 29, 2013. This email is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

with regard to exposing people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

The San Francisco General Plan Community Safety Elements describes tsunamis as follows:¹⁹⁰

“Tsunamis are large waves in the ocean generated by earthquakes, coastal or submarine landslides, or volcanoes. Damaging tsunamis are not common on the California coast. Most California tsunamis are associated with distant earthquakes (most likely those in Alaska or South America and recently in Japan), not with local earthquakes. Devastating tsunamis have not occurred in historic times in the Bay Area. Because of the lack of reliable information about the kind of tsunami runups that have occurred in the prehistoric past, there is considerable uncertainty over the extent of tsunami run-up that could occur. There is ongoing research into the potential tsunami run-up in California”

Sharp Park is within a tsunami inundation area.¹⁹¹ Overtopping of the seawall can be expected should a tsunami occur simultaneously with a severe storm event during high tide.¹⁹² None of the proposed project activities would increase the likelihood that people or structures would be exposed to a significant risk of loss, injury, or death due to inundation by seiche, tsunami, or mudflow. Therefore, the proposed project would have a less-than-significant impact with regard to this criterion.

Impact C-HY: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not make a considerable contribution to any cumulative significant effects related to hydrology or water quality. (Less than Significant with Mitigation)

As discussed above, in 2006, the California Climate Change Center reported a historic sea-level rise of seven inches in the last century and projected an additional rise of 22–35 inches by the end of this century. Since that time numerous other studies have published projected ranges of sea-level rise for this same period, with the differences in these projections attributable to different methodologies used and how well or whether glacier ice melt is included in the calculations.¹⁹³ The exact magnitude of sea level rise near the project site is unknown. Among the cumulative effects on water resources resulting from sea level rise are increased frequency of flooding of low-lying areas, increased salt water intrusion in coastal wetlands, increased coastal erosion, and increased potential for contamination of receiving waters because of inundation of areas containing hazardous substances. One approach to mitigating these and similar long-term cumulative effects is to move vulnerable development and activities out of low-lying coastal areas and to encourage coastal and shoreline uses, such as open space, that can accommodate sea level rise. The proposed project would not substantially affect existing uses on the project site and the project site would remain as open space. None of the proposed project activities would be

¹⁹⁰ City and County of San Francisco. *General Plan, Community Safety Element*, October, 2012. Available online at: http://www.sf-planning.org/ftp/General_Plan/Community_Safety_Element_2012.pdf. Accessed June 6, 2013.

¹⁹¹ California Department of Conservation. *San Mateo County Tsunami Inundation Maps*. Available online at: http://www.conservoation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/SanMateo/Documents/Tsunami_Inundation_SouthSanFrancisco_PacificCoast_Quad_SanMateo.pdf. Accessed July 19, 2013.

¹⁹² Arup North America. *Sharp Park Sea Wall Evaluation*, February 5, 2010. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

¹⁹³ California Natural Resources Agency. *2009 California Climate Adaptation Strategy, A Report to the Governor of the State of California in Responses to Executive Order S-13-2008*. Available online at: http://resources.ca.gov/climate_adaptation/. Accessed July 13, 2013.

anticipated to contribute to the effects of sea level rise. Therefore, the proposed project would not contribute considerably to any cumulative impact associated with sea level rise.

As of September 2013, there are no known past or present projects in the project vicinity that would, in combination of the proposed project, result in cumulative hydrology or water quality impacts. The Draft EIR prepared for the proposed 2006 SNRAMP, a reasonably foreseeable future project in the proposed project's vicinity, concluded that the proposed 2006 SNRAMP would not result in any significant impacts with respect to hydrology or water quality. A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the environment, including hydrology and water quality impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.¹⁹⁴ Thus, no cumulative impact to hydrology or water quality within the project vicinity exists to which this project could potentially contribute.

The proposed project would not have a significant impact on hydrology or water quality with the implementation of **Mitigation Measures M-BIO-2b, M-BIO-4a, and M-BIO-4b**. Thus, the project would not contribute considerably to a cumulative impact to hydrology or water quality, even if one existed.

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

¹⁹⁴ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

<u>Topics:</u>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Question 16c is not applicable because the project site is not within one-quarter mile of an existing or proposed school. The project site is not located near a public or private airport or within an airport land use plan area. Therefore, Questions 16e and 16f do not apply to the proposed project.

Impact HZ-1: The proposed project would not create a significant hazard through routine transport, use, disposal, handling or emission of hazardous materials. (No Impact)

The proposed project includes improvements to existing facilities and creation of habitat and would not involve routine transport, use, disposal, handling or emission of hazardous materials.¹⁹⁵ Therefore, no impact would result from the proposed project with respect to the routine transport, use, disposal, handling or emission of hazardous materials.

Impact HZ-2: Implementation of the proposed project activities would not result in a significant increase in the mosquito or tick population. (Less than Significant)

San Mateo County Mosquito and Vector Control District (SMCMVCD) provides mosquito and insect control at Sharp Park. The SMCMVCD has programs for the control of mosquitoes and ticks, including mosquito-borne diseases such as the West Nile virus. The SMCMVCD’s integrated pest management for mosquito control includes a preventive approach, underground source control, and mosquito control within pools, ponds, fountains, marshes, and creeks. The SMCMVCD’s integrated management includes controlling mosquitoes in their immature stages before emerging as biting adults. Further the SMCMVCD programs include a Lyme disease program, a tick prevention and removal program, and a tick-borne diseases program.¹⁹⁶

¹⁹⁵ Section 25501(h) of the California Health and Safety Code defines “Hazardous materials” as materials that, because of their quantity, concentration, or physical or chemical characteristics, pose a substantial present or potential hazard to human health and safety or to the environment if released to the workplace or environment.

¹⁹⁶ San Mateo County Mosquito and Vector Control District (SMCMVCD). Available online at: <http://www.smcmaad.org/index.htm>. Accessed July 11, 2013.

The SMCMVCD mainly uses the following mosquito larva treatments:¹⁹⁷

- BVA-2 Oil: A refined petroleum distillate that breaks down in a few days. It is applied to the surface of standing water and causes mosquito larvae to drown.
- Methoprene: A juvenile growth hormone that is targeted specific to mosquito larvae. It mimics the growth hormone produced in a developing larva. They stop producing the hormone when they pupate. When methoprene is applied to the water, it keeps the larvae in a juvenile stage.
- *Bacillus thuringiensis israelis* (Bti): A bacteria that is toxic to mosquito larvae. The bacteria cause the stomach lining of mosquito larvae to rupture and ultimately killing the mosquito larvae.
- Mosquito fish (*Gambusia affinis*): These fish eat mosquito larvae. This is known to be a reliable biological control method.

The proposed improvements to the existing pumphouse would not change the depth or shape of water bodies. Therefore, these improvements would not create new areas of standing water that could lead to an increase the mosquito or tick population. As such, the proposed improvements to the pumphouse would have no impact on public health relative to mosquitoes and ticks.

Increased depths of HSP and the connecting channel as a result of the proposed sediment removal activities and a new perennial pond constructed as part of this project could increase the mosquito population in that area. The SMCMVCD would continue to control mosquitoes at the project site. The SFRPD would coordinate with the SMCMVCD in the implementation of the proposed sediment and emergent vegetation removal activities and the construction of the pond to minimize the potential for developing mosquito breeding habitat.

Over the past several years, sediments have accumulated in HSP and the connecting channel and enhanced the growth of cattails; cattail and tule stands provide ideal habitat for tule mosquitoes. The proposed project activities include removal of cattails and bulrush, which would reduce the habitat of tule mosquitoes. In addition, the SMCMVCD would continue to implement the Integrated Pest Management (IPM) program to control Lyme disease and tick-borne diseases.

The SFRPD proposes to implement the following BMPs to control the spread of mosquito-borne disease as part of this project.

1. Educate staff about the most effective ways to avoid being bitten by mosquitoes;
2. Remove small water features that contain standing water or treat those features with *Bacillus thuringiensis israelis* a biological control agent for mosquito larvae, if the features were to remain and Public Health Services were to identify a potential health hazard; and
3. Encourage staff to drain any standing water in stored equipment or temporary depressions.

In light of the above, the proposed project would result in a less-than-significant impact from mosquitoes or ticks.

¹⁹⁷ SMCMVCD. *Preventative Approach*. Available online at: http://www.smcvad.org/preventative_control.htm. Accessed July 11, 2013.

Impact HZ-3: Implementation of the proposed project would not create a significant hazard through the use of pesticides for vegetation control. (No Impact)

No herbicides or pesticides would be used as part of this project. Therefore, no impact would result from the proposed project.

Impact HZ-4: The proposed project would 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. (Less than Significant)

The proposed project could result in accidental release of hazardous materials into the environment. The proposed project would require the use of motor vehicles and motorized equipment for the project activities around HSP and the connecting channel. Hazardous materials likely to be used during the project construction activities include fuel, oil, solvents, and lubricants for equipment and equipment maintenance. Similar motor vehicles and motorized equipment are regularly used at Sharp Park for the ongoing maintenance work and there have been no known incidents at Sharp Park that resulted in release of a substantial amount of hazardous materials from motor vehicles and motorized equipment. Hazardous materials would be used in marginal quantities as part of this project and would be stored outside the project site. Any activities involving hazardous materials and hazardous waste¹⁹⁸ would be conducted in accordance with strict health and safety standards mandated by the Occupational Safety and Health Administration (OSHA). Therefore, the proposed project would result in less-than-significant impacts from accidental releases of hazardous materials.

Impact HZ-5: Implementation of the proposed project activities would not result in substantial fire hazard impacts. (Less than Significant)

Motorized equipment used during construction would increase the risk of fire. Workers involved in the proposed project activities would carry fire extinguishers in their trucks and would use appropriate fire prevention and suppression measures during construction. Therefore, the proposed project would result in less-than-significant impacts from fire hazards.

Impact C-HZ: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not make a considerable contribution to any cumulative significant impacts related to hazardous materials. (Less than Significant with Mitigation)

As of September 2013, there are no known past or present projects in the project vicinity that would, in combination of the proposed project, result in cumulative hazardous materials impacts during the construction period of the proposed project. The Draft EIR prepared for the proposed 2006 SNRAMP, a reasonably foreseeable future project in the proposed project's vicinity, concluded that the proposed 2006 SNRAMP would not result in any significant impacts with respect to hazardous materials. [A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration \(Planning Department Case No. 2013.1008E\) concluded that the proposed](#)

¹⁹⁸ "Hazardous waste" is defined as any material that is relinquished, recycled, or inherently waste-like and falls under Title 22 of the California Code of Regulations. Division 4.5, Chapter 11, contains regulations for classifying hazardous wastes. A waste is considered hazardous if it causes human health effects, has the ability to burn, causes severe burns or damages materials, or causes explosions or generates toxic gases, in accordance with the criteria established in Article 3. Article 4 lists specific hazardous wastes, and Article 5 identifies specific waste categories, including hazardous wastes, as defined by the Resource Conservation and Recovery Act, non-Resource Conservation and Recovery Act hazardous wastes, extremely hazardous wastes, and special wastes.

restoration would not result in any significant effects on the environment, including hazards and hazardous materials impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.¹⁹⁹ Thus, no cumulative impact to hazardous materials within the project vicinity exists to which this project could potentially contribute.

Impacts from hazards are generally site-specific, and typically do not result in cumulative impacts. The proposed project would not have a significant impact with respect to hazardous materials on the project site or in its vicinity. Thus, the proposed project would not contribute considerably to a cumulative hazardous materials impact, even if one existed.

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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Encourage activities which result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The project site is designated Mineral Resource Zone 1 (MRZ-1) by the California Division of Mines and Geology (CDMG) under the Surface Mining and Reclamation Act of 1975.²⁰⁰ This designation indicates the area where there is adequate geologic information which indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence. This zone is applied where well developed lines of reasoning, based on economic-geologic principles and adequate data, indicate that the likelihood for occurrence of significant mineral deposits is nil or slight.²⁰¹

There are no operational mineral resource recovery sites in the project site or its immediate vicinity whose operations or accessibility would be affected by the construction or operation of the proposed project. Therefore, questions 16a and 16b are not applicable to this project.

¹⁹⁹ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

²⁰⁰ California Division of Mines and Geology (CDMG). *Mineral Land Classification Map, San Mateo and San Francisco Counties* by Melvin C. Stinson, Michael W. Manson, and John J. Pioppert, 1982. This map is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

²⁰¹ CDMG. *Guideline for Classification and Designation of Mineral Lands*. Available online at: <http://www.conservation.ca.gov/smgbl/Guidelines/Documents/ClassDesig.pdf>. Accessed April 8, 2013.

Impact ME-1: Implementation of the proposed project would not encourage activities which would result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner. (Less than Significant)

During the project construction, fuel (diesel and gasoline) would be consumed by motorized equipment and by trucks and other construction equipment including a backhoe, Aquamog, and long-arm excavator. Use of these fuels by the project work crews are expected to be minor in amount. Given the minor scope of the proposed project, use of energy and fuels by the proposed project is expected to be less than significant.

Impact C-ME: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the site vicinity, would not make a considerable contribution to any cumulative significant impacts related to energy or minerals. (Less than Significant)

As of September 2013, there are no known past or present projects in the project vicinity that would, in combination of the proposed project, result in energy or mineral impacts. The Initial Study prepared for the proposed 2006 SNRAMP concluded that the proposed 2006 SNRAMP would not result in any significant impacts with respect to energy or minerals. A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the environment, including mineral and energy resources impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.²⁰² Thus, no cumulative impact to energy or minerals within the project vicinity exists to which this project could potentially contribute.

The project-generated demand for electricity would be negligible in the context of overall demand within Sharp Park and its vicinity. Therefore, the proposed project would not contribute to a cumulative energy or minerals impact, even if one existed.

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
18. AGRICULTURE AND FOREST RESOURCES—					
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

²⁰² San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Because no farmland or forest land is present within the project site, Questions relevant to impacts to agricultural resources and forest land are not applicable to the proposed project.

The project site is located entirely within Sharp Park within the City of Pacifica. The California Department of Conservation’s Farmland Mapping and Monitoring Program identifies the project site as either “Urban and Built-up Land” or “Other Land.”²⁰³

“Urban and Built-up Land” is defined as “land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel and commonly include residential, industrial, commercial, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures.

“Other Land” is defined as “land not included in any other mapping category; commonly include low density rural developments, brush, timber, wetland, and riparian areas; not suitable for livestock grazing, confined livestock, poultry, or aquaculture facilities, strip mines, borrow pits, and water bodies smaller than 40 acres; and include vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres.”

Because the project site does not contain agricultural uses and is not zoned for such uses, the proposed project would not convert any prime farmland, unique farmland, or Farmland of Statewide Importance to non-agricultural use, and it would not conflict with existing zoning for agricultural land use or a Williamson Act contract, nor would it involve any changes to the environment that could result in the conversion of farmland. There is likewise no forest land on the project site.

As of September 2013, there are no known past or present projects in the project vicinity that would, in combination of the proposed project, result in agriculture or forest resources impacts during the construction period of the proposed project. The Draft EIR prepared for the proposed 2006 SNRAMP concluded that the proposed 2006 SNRAMP would not result in any significant impacts with respect to agriculture or forest resources. A Categorical Exemption prepared for the Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E) concluded that the proposed restoration would not result in any significant effects on the environment,

²⁰³ California Department of Conservation, *San Mateo County Important Farmland 2010*, October 2011. Available online at: <ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2010/smt10.pdf>. Accessed March 29, 2013.

including agriculture and forest resources impacts, and, thus, that project was appropriately exempt from CEQA under Section 15333 of the CEQA Guidelines.²⁰⁴ Thus, no cumulative impact to agriculture or forest resources within the project vicinity exists to which this project could potentially contribute.

The proposed project would have no impacts to agricultural or forest resources, and would not contribute to cumulative agriculture or forest resources impact, even if one existed.

<u>Topics:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporated</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>	<u>Not Applicable</u>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

As discussed above, with the implementation of the mitigation measures the proposed project is anticipated to have only less-than-significant impacts in the environmental topics discussed. The foregoing analysis identifies potentially significant impacts to archeological resources, paleontological resources, human remains, air quality, biological resources, and hydrology and water quality. These potentially significant impacts would be mitigated through implementation of mitigation measures as described below and more fully within Section F of this Initial Study.

As discussed in Section E.4, Cultural and Paleontological Resources, it is possible that below-ground archeological and paleontological resources and human remains may be present within the project site. Any potential significant impacts to archeological and paleontological resources and human remains resulting from soil-disturbing activities would be reduced to a less-than-

²⁰⁴ San Francisco Planning Department. *Categorical Exemption, Sharp Park Upland Habitat Restoration (Planning Department Case No. 2013.1008E)*, August 5, 2013. Available online at: <http://www.sf-planning.org/index.aspx?page=3447>. Accessed December 17, 2013.

significant level with the implementation of **Mitigation Measures M-CP-2, M-CP-3, and M-CP-4**, which include measures to address accidental discovery of archeological and paleontological resources and human remains.

As discussed in Section E.7, Air Quality, construction associated with the proposed project activities could generate fugitive dust during soil-disturbing activities including sediment and emergent vegetation removal activities, excavation, site grading, installation of proposed structures, and realignment of golf cart path. Although the proposed project would involve mostly wet soils, unmitigated, fugitive dust generated by the proposed project could result in significant air quality impacts. Any potential significant impacts with respect to fugitive dust would be reduced to a less-than-significant level with the implementation of **Mitigation Measure M-AQ-2**, which addresses the control and suppression of fugitive dust.

Additionally, as discussed in Section E.13, Biological Resources, it is possible that the proposed project could result in a significant impact to special-status species including, but not limited to, CRLF, SFGS, WPT, salt marsh common yellowthroat, and black-crowned night heron. **Mitigation Measures M-BIO-2a, M-BIO-2b, and M-BIO-2c** would reduce the impacts to a less-than-significant level. It is also possible that the proposed project would result in significant impacts to the wetlands in the project area or its vicinity. With the implementation of **Mitigation Measures M-BIO-4a and M-BIO-4b**, such potential significant impacts would be reduced to a less-than-significant level. Accordingly, the proposed project would not result in a significant impact to biological resources.

Furthermore, as discussed in Section E. 15, Hydrology and Water Quality, the proposed project could result in significant impacts to water quality resulting from acid sulfate soils, other chemical components, or anoxic conditions. With the implementation of **Mitigation Measure M-BIO-2b**, this impact would be reduced to a less-than-significant level.

Cumulative projects in the project site vicinity primarily include the proposed 2006 SNRAMP as discussed in Section E of this Initial Study. With incorporation of identified mitigation measures, the proposed project would not result in a considerable contribution to any cumulatively significant impacts.

In light of the above, the proposed project would not result in any significant impacts.

F. MITIGATION MEASURES AND IMPROVEMENT MEASURES

Mitigation Measure M-CP-2 - ~~Accidental Discovery~~ Archeological Testing

~~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; or to any project subcontractor (including demolition, excavation, grading, etc. firms) 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 and subcontractor(s)) 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 an archaeological consultant from the pool of qualified archaeological consultants maintained by the Planning Department archaeologist. 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 archaeological 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 describes 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 Archaeological 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 EP division of the Planning Department shall receive one bound copy, one unbound copy and one unlocked, searchable PDF copy on CD 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.~~

Based on a reasonable presumption that archeological resources may be present within the project site, the following measures shall be undertaken to avoid any potentially significant adverse effect from the proposed project on buried or submerged historical resources. The project sponsor shall retain the services of an archaeological consultant from the rotational Department Qualified Archaeological Consultants List (QACL) maintained by the Planning Department archaeologist. The project sponsor shall contact the Department archeologist to obtain the names and contact information for the next three archeological consultants on the QACL. The archeological consultant shall undertake an archeological testing program as specified herein. In addition, the consultant shall be available to conduct an archeological monitoring and/or data recovery program if required pursuant to this measure. The archeological consultant's work shall be conducted in accordance with this measure at the direction of the Environmental Review Officer (ERO). All plans and reports prepared by the consultant as specified herein shall be submitted first and directly to the ERO for review and comment, and shall be considered draft reports subject to revision until final approval by the ERO. Archeological monitoring and/or data recovery programs required by this measure could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of construction can be extended beyond four weeks only if such a suspension is the only feasible means to reduce to a less than significant level potential effects on a significant archeological resource as defined in CEQA Guidelines Sect. 15064.5 (a)(c).

Consultation with Descendant Communities: On discovery of an archeological site²⁰⁵ associated with descendant Native Americans, the Overseas Chinese, or other descendant group an appropriate representative²⁰⁶ of the descendant group and the ERO shall be contacted. The representative of the descendant group shall be given the opportunity to monitor archeological field investigations of the site and to consult with ERO regarding appropriate archeological treatment of the site, of recovered data from the site, and, if applicable, any interpretative treatment of the associated archeological site. A copy of the Final Archaeological Resources Report shall be provided to the representative of the descendant group.

Archeological Testing Program. The archeological consultant shall prepare and submit to the ERO for review and approval an archeological testing plan (ATP). The archeological testing program shall be conducted in accordance with the approved ATP. The ATP shall identify the property types of the expected archeological resource(s) that potentially could be adversely affected by the proposed project, the testing method to be used, and the locations recommended for testing. The purpose of the archeological testing program will be to determine to the extent possible the presence or absence of archeological resources and to identify and to evaluate whether any archeological resource encountered on the site constitutes an historical resource under CEQA.

At the completion of the archeological testing program, the archeological consultant shall submit a written report of the findings to the ERO. If based on the archeological testing program the archeological consultant finds that significant archeological resources may be present, the ERO in consultation with the archeological consultant shall determine if additional measures are warranted. Additional measures that may be undertaken include additional archeological testing.

²⁰⁵ By the term "archeological site" is intended here to minimally included any archeological deposit, feature, burial, or evidence of burial.

²⁰⁶ An "appropriate representative" of the descendant group is here defined to mean, in the case of Native Americans, any individual listed in the current Native American Contact List for the City and County of San Francisco maintained by the California Native American Heritage Commission and in the case of the Overseas Chinese, the Chinese Historical Society of America. An appropriate representative of other descendant groups should be determined in consultation with the Department archeologist.

archeological monitoring, and/or an archeological data recovery program. No archeological data recovery shall be undertaken without the prior approval of the ERO or the Planning Department archeologist. If the ERO determines that a significant archeological resource is present and that the resource could be adversely affected by the proposed project, at the discretion of the project sponsor either:

- A) The proposed project shall be re-designed so as to avoid any adverse effect on the significant archeological resource; or
- B) A data recovery program shall be implemented, unless the ERO determines that the archeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible.

Archeological Monitoring Program. If the ERO in consultation with the archeological consultant determines that an archeological monitoring program shall be implemented the archeological monitoring program shall minimally include the following provisions:

- The archeological consultant, project sponsor, and ERO shall meet and consult on the scope of the AMP reasonably prior to any project-related soils disturbing activities commencing. The ERO in consultation with the archeological consultant shall determine what project activities shall be archeologically monitored. In most cases, any soils- disturbing activities, such as demolition, foundation removal, excavation, grading, utilities installation, foundation work, driving of piles (foundation, shoring, etc.), site remediation, etc., shall require archeological monitoring because of the risk these activities pose to potential archaeological resources and to their depositional context;
- The archeological consultant shall advise all project contractors to be on the alert for evidence of the presence of the expected resource(s), of how to identify the evidence of the expected resource(s), and of the appropriate protocol in the event of apparent discovery of an archeological resource;
- The archeological monitor(s) shall be present on the project site according to a schedule agreed upon by the archeological consultant and the ERO until the ERO has, in consultation with project archeological consultant, determined that project construction activities could have no effects on significant archeological deposits;
- The archeological monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material as warranted for analysis;
- If an intact archeological deposit is encountered, all soils-disturbing activities in the vicinity of the deposit shall cease. The archeological monitor shall be empowered to temporarily redirect demolition/excavation/pile driving/construction activities and equipment until the deposit is evaluated. If in the case of pile driving activity (foundation, shoring, etc.), the archeological monitor has cause to believe that the pile driving activity may affect an archeological resource, the pile driving activity shall be terminated until an appropriate evaluation of the resource has been made in consultation with the ERO. The archeological consultant shall immediately notify the ERO of the encountered archeological deposit. The archeological consultant shall make a reasonable effort to assess the identity, integrity, and significance of the encountered archeological deposit, and present the findings of this assessment to the ERO.

Whether or not significant archeological resources are encountered, the archeological consultant shall submit a written report of the findings of the monitoring program to the ERO.

Archeological Data Recovery Program. The archeological data recovery program shall be conducted in accord with an archeological data recovery plan (ADRP). The archeological consultant, project sponsor, and ERO shall meet and consult on the scope of the ADRP prior to preparation of a draft ADRP. The archeological consultant shall submit a draft ADRP to the ERO. The ADRP shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain. That is, the ADRP will identify what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historical property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archeological resources if nondestructive methods are practical.

The scope of the ADRP shall include the following elements:

- Field Methods and Procedures. Descriptions of proposed field strategies, procedures, and operations.
- Cataloguing and Laboratory Analysis. Description of selected cataloguing system and artifact analysis procedures.
- Discard and Deaccession Policy. Description of and rationale for field and post-field discard and deaccession policies.
- Interpretive Program. Consideration of an on-site/off-site public interpretive program during the course of the archeological data recovery program.
- Security Measures. Recommended security measures to protect the archeological resource from vandalism, looting, and non-intentionally damaging activities.
- Final Report. Description of proposed report format and distribution of results.
- Curation. Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

Human Remains and Associated or Unassociated Funerary Objects. The treatment of human remains and of associated or unassociated funerary objects discovered during any soils disturbing activity shall comply with applicable State and Federal laws. This shall include immediate notification of the Coroner of the City and County of San Francisco and in the event of the Coroner's determination that the human remains are Native American remains, notification of the California State Native American Heritage Commission (NAHC) who shall appoint a Most Likely Descendant (MLD) (Pub. Res. Code Sec. 5097.98). The archeological consultant, project sponsor, and MLD shall make all reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or unassociated funerary objects (CEQA Guidelines, Sec. 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.

Final Archeological Resources Report. The archeological consultant shall submit a Draft Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archeological resource and describes the archeological and historical research methods employed in the archeological testing/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.

Once approved by the ERO, copies of the FARR shall be distributed as follows: California Archaeological 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, one unbound and one unlocked, searchable PDF copy on CD 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 in or the high interpretive value of the resource, the ERO may require a different final report content, format, and distribution than that presented above.

Mitigation Measure M-CP-3 - Paleontological Training Program and Alert Sheet

To reduce the potential for the proposed project to result in a significant impact on paleontological resources, the SFRPD 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 shall also include a review of penalties for looting and disturbance of these resources. An alert sheet shall be issued 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 instruct that if a paleontological deposit is encountered within a project area, all soil-disturbing activities in the vicinity of the deposit shall cease and the ERO shall be notified immediately.
3. If an unanticipated paleontological resource is encountered during project activities, all project activities shall stop, and a professional paleontologist shall be hired to assess the potential paleontological resource and its significance. The findings shall be presented to the ERO, who shall determine the additional steps to be taken before work in the vicinity of the deposit is authorized to continue.

Mitigation Measure M-CP-4 - Human Remains, Associated or Unassociated Funerary Objects

The treatment of human remains and of associated or unassociated funerary objects discovered during any ground-disturbing activity shall comply with applicable State and Federal Laws, including immediate notification to the San Mateo County Coroner and in the event of the Coroner's determination that the human remains are Native American remains, notification to the Native American Heritage Commission (NAHC) who shall appoint a Most Likely Descendant (MLD) (Pub. Res. Code Sec. 5097.98). The project archaeological consultant, SFRPD, and MLD shall make all reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or unassociated funerary objects (CEQA Guidelines. Sec. 15064.5(d)). The agreement should take into consideration the appropriate excavation, removal, recordation, analysis, curation, possession, and final disposition of the human remains and associated or unassociated funerary objects.

Mitigation Measure M-AQ-2 - Preparation and Implementation of a Dust Control Plan

The SFRPD shall comply with the following requirements to control fugitive dust:

- The SFRPD shall designate an individual to monitor compliance with dust control requirements identified in this mitigation measure;
- Water all active construction areas sufficiently to prevent dust from becoming airborne (without creating runoff) in any area of land clearing, earth movement, excavation, and other dust-generating activity. Watering shall occur as needed, and whenever wind speeds exceed 15 miles per hour. Reclaimed water shall be used whenever possible;
- Establish shutdown conditions based on wind, soil migration, and other factors;
- Limit the area subject to construction activities at any one time;
- During excavation and dirt-moving activities, wet sweep or vacuum the routes and paths where work is in progress at the end of the workday;
- Cover any inactive (no disturbance for more than seven days) stockpiles greater than ten cubic yards or 500 square feet of excavated materials, backfill material, import material, gravel, sand, road base, and soil with a 10 mil (0.01 inch), wildlife-friendly polyethylene plastic or equivalent tarp and brace it down or use other equivalent soil stabilization techniques;
- Limit the amount of soil in hauling trucks to the size of the truck bed, and secure the load with a tarpaulin;
- Enforce a 10-mile per hour (mph) speed limit for vehicles entering and exiting construction areas;
- All soil stockpiles, if any, shall be protected against wind and rainfall erosion at all times. Wildlife-friendly plastic sheeting or other similar material shall be used to cover soils and shall be securely anchored by sandbags or other suitable means. At no time shall any stockpiled materials be allowed to erode into any water body or drainage facility or onto any roadway; and
- Install and use wheel washers to clean truck tires.

The SFRPD shall prepare and submit a site-specific Dust Control Plan to the ERO for records. The Plan shall detail a protocol for project compliance with the above requirements.

Mitigation Measure M-BIO-2a - Protection of CRLF, SFGS, and WPT

1. All sensitive habitats outside the construction site shall be avoided during and following project implementation. All biologists working on the project and their roles shall be approved by the USFWS and CDFW²⁰⁷ based on their qualifications. All approved biologists shall be part of the Project Implementation Team. The SFRPD shall designate one of the USFWS/CDFW-approved biologists to oversee and coordinate all avoidance and survey tasks of the Project Implementation Team. Prior to the commencement of any project-related construction activity, an approved biological monitor shall flag the sensitive areas and/or the limits of the construction site with suitable markers that are easily discernible by construction equipment operators. No construction equipment or personnel shall enter the sensitive areas designated for avoidance by the project;
2. The lead USFWS/CDFW-approved biological monitor shall be present at all planning meetings prior to project implementation. A USFWS/CDFW-approved biological monitor shall present an educational program at one or more such meetings regarding the listed species and their habitats. Every person who works on project implementation shall receive this education program and sign a form indicating they have attended and agree

²⁰⁷ Formally known as CDFG

- to abide by the terms and conditions being implemented to avoid take of listed species and/or habitat. A USFWS/CDFW-approved biological monitor shall be present at the site during all construction activities including, but not limited to, vegetation and sediment removal, placement of concrete support structures for the walkway, replacement of the retaining wall and pathway repair. The biological monitor shall have the authority to stop work temporarily in order to protect the listed species or the flagged sensitive areas;
3. Prior to commencement of any construction activities and daily prior to construction each day, a USFWS/CDFW-approved biological monitor shall survey the site for listed species. A USFWS/CDFW-approved biologist shall also oversee the installation of exclusion fencing in segments or fully enclosing components of the construction site as appropriate. The biological monitor shall inspect the integrity of the exclusion fencing on a daily basis;
 4. During the proposed sediment and vegetation removal activities, if required, up to three biological monitors shall be present to: 1) monitor the area of vegetation or sediment removal; 2) observe the material as it is transferred to the shoreline; and 3) inspect material as it is loaded into a container/dump bed that will allow the water in the excavated sediment to drain out before removal from the site;
 5. Biological monitors shall complete a daily monitoring log that records information on compliance and construction activities as well as avoidance measures implemented each day during the project. Each monitor shall submit a daily monitoring report from to the lead biologist before the start of the next construction day. Photographic documentation of project activities shall accompany each daily monitoring log. Within 60 days of completion of the project, the SFRPD shall submit a report to the USFWS and CDFW documenting compliance with the terms and conditions and avoidance of unauthorized take of species or habitat;
 6. No earthmoving or soil disturbing work shall occur starting October 31 and ending June 1, the breeding season for CRLF and the season when SFGS are less active on the site;
 7. Terrestrial vegetation in undisturbed areas around HSP and the connecting channel shall be cleared by manual means to a height of four inches (or a height that allows visibility of the ground) under the supervision of an approved biological monitor and checked for the presence of CRLF, SFGS, and WPT;
 8. Prior to ground disturbing activities associated with construction, including the use of staging or vehicle access areas or the removal or placement of fill or construction materials, rodent burrows in the construction site shall be hand excavated by a USFWS/CDFW-approved biologist until the burrow terminates or until a maximum depth of 30 centimeters;
 9. Vehicle speeds in the project area shall not exceed 10 miles an hour. The USFWS/CDFW-approved biological monitor shall inspect for CRLF, SFGS, and WPT underneath any vehicle that is parked for 30 minutes or more prior to moving the vehicle. All construction personnel shall inspect under their tires and vehicle if it is in idle for more than five minutes and has not been inspected by the on-site monitor. Vehicles accessing the construction site shall be limited to the minimum necessary to complete the project. Project personnel shall park personal vehicles at a staging area located away from all aquatic habitats or areas of sensitive upland habitat;

10. Any workers on the site that observe any frog, snake, or turtle shall immediately report their findings to the on-site biological monitor and immediately suspend work that may be harmful to the individual. The monitor shall identify the animal if it has not left the area. If a CRLF, SFGS, or WPT is observed in the work area, it shall be relocated by a USFWS/CDFW-approved biological monitor to the nearest suitable aquatic habitat out of harm's way. Work may only recommence if CRLF, SFGS, and WPT move out of harm's way or the animal is relocated by the biological monitor. Work may not recommence until the biological monitor has returned to the work area and gives approval;
11. Only USFWS/CDFW-approved personnel shall be allowed to capture or attempt to capture and move CRLF, SFGS, WPT, or other non-listed wildlife (e.g., treefrogs, small rodents) in the work area;
12. Erosion control best management practices (silt fences, coir rolls, straw bales) shall be employed as part of the dewatering of sediments after removal and while soils are exposed. The erosion control measures shall not include netting, plastic or natural monofilament netting or other materials that may entrap CRLF, SFGS, or WPT;
13. After completion of the project, the access routes in the wetland shall be revegetated with appropriate native plants and erosion control measures, as described in Measure 12, as outlined above, shall be installed on exposed soils with slopes of 3:1 or greater;
14. All construction activities shall occur in uplands and on the golf course. Stockpiling and staging areas shall be located in the uplands and in areas cleared for species and the golf course. Construction materials (bricks, boards, shoring, concrete forms, etc.) shall be elevated approximately four to six inches above ground to minimize the potential for species to take cover under these items. If feasible, materials shall be staged on a trailer/truck bed to avoid contact with the ground. Construction materials shall be brought to on-site staging areas as close to the time they are needed as possible;
15. The SFRPD shall minimize the potential for harm, harassment, injury, and death of federally listed wildlife species resulting from project-related activities including implementation of the Conservation Measures in the Biological Opinion;
16. If requested, during or upon completion of construction activities, the SFRPD shall ensure the USFWS, CDFW, or their authorized agents have immediate access to the project area. The on-site biologist and/or a representative from the USACE/SFRPD shall accompany USFWS personnel on an on-site inspection of the project area(s) to review project effects to CRLF and SFGS and their habitat;
17. The SFRPD shall ensure compliance with the Reporting Requirements of the Biological Opinion;
18. During the course of construction activities, biological monitors may determine that relocation of a CRLF or SFGS is necessary for the safety of individual animals. If it is determined that a SFGS needs to be moved, the USFWS shall be contacted for further guidance. Individuals shall be relocated to appropriate sites away from disturbance on Sharp Park property;
19. Within nine months of issuance of the Biological Opinion, the SFRPD shall develop, for the USFWS review and approval, a monitoring plan for the new perennial pond. The plan shall include monitoring of: 1) the use of the pond by all life stages of CRLF and SFGS, 2) the amount of emergent vegetation and open water available, and 3) how

effective barriers are at preventing entry by people and off-leash dogs. If predators become established in the pond they shall be immediately removed and the USFWS shall be notified; and

20. Implementation of the pond monitoring plan shall begin immediately following the construction of the new pond.

Mitigation Measure M-BIO-2b - Protection of Special-Status Species and Water Quality from Acid Sulfate Soils and Other Components

Prior to commencement of any on-site work related to the proposed removal of sediment and emergent vegetation in HSP or the connecting channel and culverts that link HSP and LS, sediment core sampling tests shall be conducted in the manner specified in this mitigation measure.

The result of the sediment core sampling tests and remediation measures recommended by a qualified SFRPD biological/hydrological consultant, if any, shall be submitted to the USFWS and CDFW for review and approval prior to commencement of any on-site remediation work or sediment/vegetation removal work at HSP or the connecting channel and culverts. If the USFWS or CDFW determines, based on the results of the sediment core sampling tests, that remediation measures are required, the SFRPD shall submit a remediation and monitoring plan to all applicable resource agencies for review and approval prior to implementation of the remediation measures. Copies of all correspondence with the resource agencies shall be submitted to the ERO for review. The sediment core sampling tests shall include the following elements:

1. Work Plan

A Work Plan for sediment core sampling tests shall be prepared by a qualified SFRPD biological/hydrological consultant and submitted to the USFWS and CDFW for review and comment prior to commencement of any on-site work related to the sampling tests. The Work Plan shall describe, at a minimum, compliance with Items 2 through 6 of this mitigation measure. Copies of all correspondence with the resource agencies shall be submitted to the ERO for review.

2. Sampling of Sediment Cores

The sampling test shall include collection of, at minimum, one sediment core from HSP, two from the connecting channel, and one from LS. The exact locations of sampling shall be determined pursuant to the work plan developed in accordance with Item 1, above. Sample sediment cores shall include the soils between the current surface sediment level and approximately two to three feet below the current surface. This depth shall be at least one foot below the proposed depth of the future sediment-water interface.

3. Analysis of Sediment Cores and Estimation of the Potential for Formation of Acid Sulfate Soils

The sediment cores shall be analyzed every five centimeters over the first 20 centimeters of core depth and then every 10 centimeters for the remainder of the core length for the following components: Total Organic Carbon (TOC), carbonate/bicarbonate, sulfate, sulfide, sulfites, pH, calcium, sodium, iron, aluminum, chloride, conductivity, redox potential, refractory organics, organic nitrogen, total phosphorus, ammonia, nitrate+nitrite nitrogen, soluble reactive phosphorus, organic phosphorus, loosely-sorbed

phosphorus, iron-phosphorus, iron-phosphorus, aluminum-phosphorus, and calcium-phosphorus. Sediment core chemistry shall be analyzed to assess the potential reduction of sulfate to form hydrogen sulfate, iron sulfides, and reduction buffering capacity relative to acid-neutralizing capacity.

In addition, sediment oxygen demand (SOD) in the sediment cores shall be measured. Results shall be compared to the total oxidizable organic material, which would be estimated from the difference of TOC and refractory organic carbon (labile carbon). These results shall be used in the analysis of potential for formation of anoxic conditions within the newly restored HSP and connecting channel.

Sediment cores shall be analyzed based on Toxicity Reference Values (TRVs) from the USEPA and Screening Quick Reference Tables (SQuiRT) from the NOAA.²⁰⁸ A draft summary of potential toxics shall be provided to the USFW, CDFW, and ERO for review and, if needed, revision will be made to the toxicity ranges appropriate for use in analyzing the sediment cores.

The potential for formation of acid sulfate soils and anoxic conditions in the water column shall be estimated based on this analysis and in coordination with the USFWS and CDFW. If this analysis determines that acid sulfate soils could be present in this location, the SFRPD shall perform a toxic pathway analysis²⁰⁹ to determine the appropriate remediation measures. The analysis results and determination shall be submitted to the USFWS, CDFW, and ERO for review.

4. Toxics Pathway Analysis

Should the potential for acid sulfate soils and anoxic conditions be present, a toxics pathway analysis shall be conducted for potential risks and toxicities to species that may be affected by localized increases in acidity, hypoxia, or dissolved metals concentration. During this Task, toxicity standards shall be established by the USFWS, CDFW, and ERO based on the results of Items 2 and 3 above, site-specific hydrologic conditions including water exchange and dissolved oxygen levels, the species that are known to be present, and literature review. The results of this task shall be submitted to the USFWS and CDFW and any applicable resource agencies for review and approval. Copies of all correspondence with the resource agencies shall be submitted to the ERO for review.

Should the results of the sediment core tests reveal that there has been an appreciable increase in the amount of nitrogen and related compounds in the sediment cores, any necessary measures to remediate such compounds shall be undertaken in accordance with Task 5, below. The SFRPD shall hire a qualified biological/hydrological consultant to prepare a remediation and monitoring plan which shall be submitted to the USFWS and CDFW for review and approval. Copies of all correspondence with the resource agencies shall be submitted to the ERO for review.

5. Remediation

If results of the sediment core chemistry analysis reveal the potential for reduction of sulfate to form hydrogen sulfate, iron sulfides, and its reduction in buffering capacity

²⁰⁸ NOAA, Office of Response and Restoration. *SQuiRT Cards*. Available online at: <http://response.restoration.noaa.gov/cpr/sediment/squirt/squirt.html>. Accessed July 17, 2013.

²⁰⁹ A toxic pathway analysis identifies potential risks and toxicities to species that may be affected by localized increases in acidity, hypoxia, or dissolved metals concentration.

relative to acid-neutralizing capacity, or if the toxics pathway analysis indicates that their presence could potentially result in substantial stress to special-status species, the SFRPD shall implement remediation measures, as approved by the USFWS and CDFW.

Remediation measures could include, but are not limited to:

- a. Addition of lime to neutralize any acid that exists or which may form during the sediment removal process;
- b. Injection of sodium nitrate to oxidize the sediments, thereby satisfying the sediment oxygen demand; or
- c. Use of suction hydraulic sediment removal that reduces re-suspension of any form of sediments.

Depending on the severity of the condition (e.g., hypoxia), the remediation measure selected for implementation would be the least intensive beginning with Item a, when signs of hypoxia are present, to the most intensive with Item c, when hypoxia is persistent and/or widespread. The SFRPD shall select the remediation measure in consultation with the USFWS and CDFW. The remediation measure shall be selected based on immediate threats to species and sensitive life stages present during occurrence of the hypoxic condition.

6. Monitoring

During sediment and vegetation removal in HSP and the connecting channel and culverts, pH levels immediately above the sediment shall be monitored by the SFRPD to ensure that implementation of the proposed project would not adversely affect special-status species.²¹⁰ To ensure that residual acid sulfates in the water column would not adversely impact special-status species, pH levels in HSP and the connecting channel shall be monitored by the SFRPD for a period of six weeks after the proposed sediment and vegetation removal is completed. A remediation measure, such as addition of lime or injection of sodium nitrate, shall be implemented if the monitoring warrants such a remediation measure to protect special-status species based on the toxicity standards that are established in accordance with Task 4 above.²¹¹

Mitigation Measure M-BIO-2c - Protection of Bird Species

Vegetation removal activities shall be conducted outside the breeding season (February 1 to August 31), unless the following specific conditions are met: a breeding bird survey by a qualified biologist has been conducted prior to any vegetation removal activities. If active nests (or large abandoned stick nests) of a sensitive species are discovered, a 150-foot-radius avoidance buffer shall be centered on the nest site(s) to prevent nesting birds from being disturbed by power tools or other equipment. Weeds may be pulled by hand no closer than 50 feet from the nest.

²¹⁰ pH is an indicator of anoxic conditions at the sediment-surface water interface. Under anoxic conditions, hydrogen ion availability increases and binds with sulfides mobilized from sediments. Rates of transformation of sulfur are mediated by microorganisms in both the sediments and surface water. Suspension of hydrogen sulfide (H₂S) in the water column is oxidized in surface water to form sulfuric acid (H₂SO₄).

²¹¹ David Munro, Tetra Tech, Inc. Email to Stacy Bradley, SFRPD, Sharp Park Appeal: M-BIO-2b - Post Construction Monitoring, January 7, 2014. This document is available for review as part of Case File No. 2012.1427E at the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, California 94103.

Mitigation Measure M-BIO-4a - Protection of Wetlands and Natural Habitat

The SFRPD shall obtain all applicable permits from the SFBRWQCB, CCC, USACE, and CDFW to protect wetlands and natural habitat. Measures identified in these permits shall be applied, in addition to the following measures, unless otherwise specified by resource agencies:

1. In areas where work is not directly taking place, a minimum 100-foot buffer surrounding all wetlands, ponds, streams, drainages, and other aquatic habitats located on or within 100 feet of the project site shall be clearly designated on the final project construction plans and marked on the site with wildlife-friendly orange construction fencing or silt fencing. If the area is on a slope, silt fencing or other comparable management measures will be installed to prevent polluted runoff, as well as equipment, from entering the buffer area. Signs shall be installed every 100 feet on or adjacent to the buffer fence that read, "Environmentally Sensitive Area – Keep Out." Fencing and management measures shall be installed and inspected prior to project implementation and maintained throughout the restoration period. No equipment mobilization, grading, clearing, storage of equipment or machinery, vehicle or equipment washing, or similar activity, may occur until a representative of the SFRPD has inspected and approved the fencing and/or management measures installed around these features;
2. Vehicle and equipment operators shall use existing access roads and shall remain outside of wetlands and riparian areas that are not directly associated with the proposed project. Project construction and staging areas shall be delineated with construction fencing and shall avoid wetland habitat to the maximum extent feasible; and
3. All vehicles shall be brought in clean and free of weeds to prevent the spread or introduction of invasive plant species. Vehicles and equipment shall be fueled, maintained, and parked at least 100 feet from wetlands. Each morning, operators shall inspect all equipment that requires the use of fuel or fluids for leaks.

Mitigation Measure M-BIO-4b - Wetland Mitigation Plan for Temporarily Affected Areas

Consistent with the requirements for a Section 401 water quality certification permit, the SFRPD shall prepare a wetland mitigation plan for temporarily effected wetlands. Additionally, because the proposed project includes habitat restoration (i.e., construction of a perennial pond), the CCC may require an objective performance evaluation to determine project success which would include a monitoring program and methods for evaluating performance, which could be accomplished through implementation of the wetland mitigation plan. The wetland mitigation plan shall include, at a minimum, a description of the following:

- Proposed project's physical and biological impacts;
- Mitigation goals;
- Mitigation work plan;
- Management and maintenance plan;
- Success criteria and performance indicators;
- Monitoring plan; and
- Site protection measures.

The components of the above mitigation plan may be altered, supplemented, or deleted during the SFBRWQCB's review process, as the SFBRWQCB has final authority over the terms of the water quality certification.

G. PUBLIC NOTICE AND COMMENT

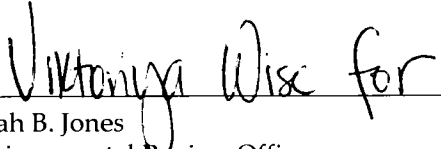
A "Notification of Project Receiving Environmental Review" was sent out on January 15, 2013, to the owners of properties within 300 feet of the Sharp Park boundaries and to occupants of properties adjacent to the project site, as well as to other interested parties. The Planning Department received several letters in response to the notice. Respondents requested to receive environmental review documents and/or expressed concerns regarding the proposed project, which included: (1) impacts to CRLF and SFGS; (2) impacts to other special-status species and wetland habitats; and 3) historic resource impacts. These issues are addressed in the appropriate topic areas in Section E, Evaluation of Environmental Effects.

H. DETERMINATION

On the basis of this initial study:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed 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 proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed 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 proposed 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 proposed project, no further environmental documentation is required.

DATE: January 9th, 2014



Sarah B. Jones
Environmental Review Officer
for
John Rahaim
Director of Planning

I. INITIAL STUDY PREPARERS

Initial Study Authors

Planning Department, City and County of San Francisco
1650 Mission Street, Suite 400
San Francisco, CA 94103

Environmental Review Officer: Sarah B. Jones

Project Supervisor: Rick Cooper

Environmental Coordinator: Kei Zushi

Air Quality and GHG: Jessica Range

Archeology: Randall Dean

Historical Resources: Shelley Caltagirone

Biological Consultant

Dave Munro
Tetra Tech, Inc.
1020 SW Taylor St., Suite 530
Portland, OR 97205
(503) 223-5388 ext. 112

Project Sponsor

Recreation and Park Department, City and County of San Francisco
McLaren Lodge-Golden Gate Park
501 Stanyan Street
San Francisco, CA 94117
(415) 575-5609
Contact: ~~Karen Mauney Brodek~~ Stacy Bradley

Project Site Owner

Recreation and Park Department, City and County of San Francisco
McLaren Lodge & Annex
501 Stanyan Street
San Francisco, CA 94117
(415) 575-5609
Contact: ~~Karen Mauney Brodek~~ Stacy Bradley