WILD Equity INSTITUTE

Brent Plater <bplater@wildequity.org>

Sharp Park Mitigation Measures

Goude, Cay <cay_goude@fws.gov> Thu, Mar 20, 2014 at 2:01 PM
To: Brent Plater <bplater@wildequity.org>
Cc: Ryan Olah <Ryan_Olah@fws.gov>

thank you Brent.

We do not have resources identified to implement these measures at this time. I will be out of town next the rest of the week and next week. Cay

On Wed, Mar 19, 2014 at 6:41 PM, Brent Plater <bplater@wildequity.org> wrote:

> Cay and Ryan,
>
> The CEQA document for the Sharp Park Pumphouse Project proposes new mitigation measures that impose several actionable requirements on USFWS, none of which were contemplated in the BO:
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> - USFWS must review and approve sediment core sampling tests for acid sulfide soils (p. 85);
> - USFWS must review and approve remediation measures and monitoring plans for acid sulfide impacts (p. 85);
> - USFWS is expected to review and comment on work plans prepared by SFRPD to conduct the above activities (p. 85);
> - USFWS is expected to review and revise the list of potential toxins discovered from the sediment core sampling (p. 86);
> - USFWS is expected to estimate the potential for acid sulfides to be present in the water column in coordination with SFRPD (p. 86);
> - USFWS is expected to review a "toxic pathways analysis" prepared by SFRPD (p. 86);
> - USFWS shall establish, review, and approve site-specific toxicity standards for acid sulfides (p. 86);
> - USFWS shall review and approve a remediation and monitoring plan for acid sulfide soils (p. 86);
> - USFWS shall review and approve specific remediation measures selected from the options offered in the plan (p. 87).
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> I have attached excerpts (7 pages) from the final CEQA document with the relevant passages highlighted in yellow for your convenience.
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> Has the Service agreed to implement these CEQA mitigation measures, even though they are not part of the BiOp? Does the Service have resources identified to implement these measures at this time?
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> Please let me know ASAP, and no later than Monday 3/24/2014.
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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 conditions[148] 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 Opinion[152] 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

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[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

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[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~~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 analysis[158] 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

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[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 (H_2S) in the water column is oxidized in surface water to form sulfuric acid (H_2SO_4).

[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 SFBRWQCB 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

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[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.