Fernandez, Xavier@Waterboards

From: Barbara Salzman <bsalzman@att.net>
Sent: Friday, January 15, 2016 8:40 AM
To: Fernandez, Xavier@Waterboards
Subject: Dutra Applicaiton for Asphalt Plant
Attachments: Durtra to Colrps and RWQCB.pdf

Please consider Marin Audubon's comments to the Corps on the Dutra Asphalt Plant on the Petaluma River to be our comments to the Water Board as well.
In addition we wish to express our support for the comments submitted by Jules Evens in regard to special status species impacts.
Thank you
Barbara Salzman

Marin Audubon Society

P.O. Box 599 | Mill Valley, CA 94942-0599 | marinaudubon.org

October 15, 2015

Bryan Matsumoto
Army Corps of Engineers
1455 Market Street, 16th Floor
San Francisco, CA

RE: PN# 2003-281040; DUTRA HAYSTACK ASPHALT PLANT PROJECT

Dear Mr. Matsumoto:

This letter is in response to the above public notice that concerns the Dutra Group's proposal to discharge 23,770 cubic yards of fill that will result in the loss of almost 2 acres of marsh. The purpose of the project is to construct and operate an asphalt plant on a 35-acre property on the Petaluma River. Because of the complexity of issues including traffic impacts both from on-land trucks and other vehicles; boat traffic; air and water quality impacts to waters of the river and adjacent and nearby wetland habitats; light and noise impacts to endangered and other species that depend on marshes along the Petaluma River; habitat impacts from possible mooring or escape of large barges from their moorings; we recommend that an Environmental Impact Statement be required. An EIS is the only means to ensure that the public's interest in having adequate independent analysis of the potential impacts of the project and the adequacy of the proposed mitigations are analyzed and disclosed.

1. Alternative Site Analysis - Because the project is not water dependent an alternative site analysis that identifies and evaluates less environmentally damaging alternative sites must be provided and assessed as the first step in analyzing the project. Because the PN does not provide any information that is contained in the Alternatives Analysis, it is impossible to provide informed specific comments. Therefore, our comments are general. Less environmentally damaging alternatives should be assessed both on-site, in different configuration on-site, and offsite. Other properties owned by the applicant, such as in San Rafael, should be evaluated. A property in a more urban, industrial area, that is not on a narrow body of water with sensitive natural resources along its banks, would be a better location for an asphalt plant. Such a site or sites should be considered.

2. Potential damage to natural resources along the river must be evaluated as should the suitability of the river to accommodate large barges without causing damage to resources along the river banks. The Petaluma River, of course, was only designated as a river to make it eligible for public funds. It actually is too narrow to qualify as a river. Since the project site is located quite a ways upstream, barges would have to pass many sensitive wetlands to get there. These marshes include the Petaluma Marsh, the largest tidal marsh in the state that has never been diked, recently restored marshes such as Shollenberger Marsh and Mira Monte, marshes owned by the CDFW as well as Marin Audubon Society's

(Bahia). It is imperative that a complete disclosure of the types, numbers and sizes of the barges, tugs and other boats/ships that would be necessary for the asphalt plant to be profitable. A thorough assessment of the adequacy of the river to accommodate the anticipated traffic considering the exiting navigation uses and sensitive resources, should be provided. A risk analysis is needed to address the potential for damage to the marshes and the aquatic species that depend on them. The analysis should at minimum address the possibility of spills and other discharges and how they could impact marshes down and up-stream, mooring damage, adequacy of the size of the navigation channel, and possible conflicts with other boats. A plan for how these impacts will be handled when they occur, and they most certainly will occur if the project is approved, must be provided.

3. Wetland mitigation - An independent assessment of the adequacy of the proposed mitigation for wetland loss should be prepared. It is unclear what the difference is between wetland restoration (.02) and wetland reestablishment (2.66). The ratio of wetland restored to wetland destroyed is under 2:1 which is not acceptable.

In general, with the limited information given, it appears that the mitigation wetland has a number of problems that make its future functioning and viability uncertain at best. The mitigation wetlands appear to be fit into spaces adjacent to sections of the property that will be actively used for asphalt production, so that noise, light and other impacts related to the asphalt production would be constant. It also appears to be disconnected from other aquatic habitats. The wetland mitigation should be located adjacent to existing wetlands and upland habitats, if possible, so that a viable larger contiguous wetland habitat is created.

It appears that some of the proposed enhancement mitigation would be on property owned by others. This increases the uncertainty of the maintenance, success and permanence of the enhancement and should not be permitted.

4. Surveys of birds and other wildlife should be conducted on-site and on nearby sites and impacts of the project on them should be discusssed. We agree with the PN, that there is potential for rails to use the site as foraging and dispersal habitat. We see rails using narrow fringes of marsh in this way along waterways other locations: e.g. Corte Madera Creek and Coyote Creek in Mill Valley. Data in the CCNDB is not current and it alone should not be relied upon to conclude that a species is not present. We suggest that surveys from the Audubon Christmas Bird Counts would be one source that would provide more current survey information.

5. Shamrock mitigation wetlands - The PN states that this mitigation area is in generally poor condition, however, that should have no relevance to whether or not they are protected. If these wetlands now in the ownership of Dutra are in poor condition, this may be a message of concern that future mitigation wetlands would be similarly neglected.

To address the loss of the Shamrock mitigation wetlands, we understand that the applicant proposes to purchase credits in a mitigation bank. We strongly oppose such a scheme. The Shamrock mitigation was originally required fcor the purpose of compensating at this site for wetland losses. This does not include moving required mitigation sites around to suit different property owners. To ensure adequate

assessment, the requirements and responsibility for the Shamrock permit should be transferred to Dutra, and should not be compromised. There should be a complete description of the current and proposed status of this mitigation presented to the public for review along with an evaluation of any proposal to change its location. Moving the mitigation wetland to some unidentified location would have questionable, at best, benefit for the local species that depend on them.

Thank you for considering our comments.

Sincerely,

Barbara Salzman, Co-chair
Conservation Committee

Phil Peterson, Co-chair
Conservation Committee

Cc: CDFW
RWQCB

Fernandez, Xavier@Waterboards

From: Dale Axelrod <dalea@sonic.net>
Sent: Friday, January 15, 2016 9:49 AM
To: Fernandez, Xavier@Waterboards
Subject: Oppose Application by Dutra Haystack Asphalt Plant Project
Attachments: Dutra Asphalt Plant.pdf

San Francisco Regional Water Quality Control Board
1515 Clay Street, Ste 1400
Oakland, CA 94612

RE: Application by Dutra Haystack Asphalt Plant Project, Petaluma, for
Water Quality Certification under Section 401 of the Clean Water Act.

Dear Mr. Fernandez:

Please note attached opposing resolution from the Sonoma County Democratic Party.

Thanks for your consideration.

Best regards,

Dale Axelrod
Sonoma County Democratic Party
Chair – Outreach, Advocacy, & Legislation Committee
522 East D St
Petaluma CA 94952-3212

Phones (California, USA):
---------- Mobile & SF Voice Mail (24 hrs): 415-824-1549
---------- Petaluma studio (7am-11pm): 707-762-4125
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---------- www.sonomademocrats.info
---------- www.cadem.org

Sonoma County Democratic Party Resolution

to the Board of Supervisors regarding the Dutra Asphalt Plant

WHEREAS, the Petaluma City Council has once again formally and unanimously asked the Sonoma County Board of Supervisors to deny the proposed location of the Dutra Haystack Landing Asphalt & Recycling Plant within Petaluma's longstanding Urban Growth Boundary, and

WHEREAS, the proposed location lies directly across from Shollenberger Park, a treasured Petaluma community resource, and

WHEREAS, the revised version of the project proposal is substantially no different from the original in its negative impacts, and

WHEREAS, siting an asphalt plant at the proposed location would circumvent a 76 percent countywide vote establishing a scenic corridor below Petaluma to the Marin County line, and would require a vote of the people;

THEREFORE BE IT RESOLVED that the Sonoma County Democratic Party reiterates its urgent call to the Sonoma County Board of Supervisors to respect the unanimous request of the elected representatives of the City of Petaluma, as well as the opposition of the vast majority of Petalumans testifying during public comment on the proposal, and to DENY ANY AND ALL APPROVALS AND AMENDMENTS which would permit the location of the Dutra asphalt plant on the Petaluma River directly across from Shollenberger Park, and to instead fulfill their stewardship obligations in safeguarding an irreplaceable natural habitat, and the gateway to Sonoma County.

BE IT FURTHER RESOLVED, that the Sonoma County Democratic Party urges the Sonoma County Board of Supervisors to join in with the City of Petaluma and other municipalities to work collaboratively with the applicant, and other stakeholders to identify and secure a mutually satisfactory and suitable alternative site.

Resolution adopted by the Sonoma County Democratic Party on February 9, 2010

Fernandez, Xavier@Waterboards

From: Meredith Wilensky <meredith@lozeaudrury.com>
Sent: Friday, January 15, 2016 5:08 PM
To: Fernandez, Xavier@Waterboards
Cc: Mike Lozeau; David Keller
Subject: Comments RE Water Quality Certification Application for Dutra Haystack Asphalt Plant Project

Dear Xavier:

Please find here (and in the link below) the documents consisting of Lozeau Drury's comment letter regarding Water Quality Certification Application for Dutra Haystack Asphalt Plant Project on behalf of the Petaluma River Council, et. al.

Please let me know if you have any issues accessing the files.

Best,
Meredith Wilensky

https://www.dropbox.com/sh/q3vkerxy4m65yas/AABlScbkHT8Mpom6hdrHQAp7a?dl=0

On Thu, Dec 10, 2015 at 3:33 PM, Fernandez, Xavier@Waterboards <Xavier.Fernandez@waterboards.ca.gov> wrote:

Dear Interested Parties:

The San Francisco Bay Regional Water Quality Control Board (Water Board) received an application for a Clean Water Act Section 401 Water Quality Certification (Application) for the Dutra Haystack Asphalt Plant Project (Project). The proposed Project would construct an asphalt plant facility and associated conveying system on the approximately 35-acre Haystack Landing site, located at 3355 Petaluma Boulevard South.

The Application for the Project is available for public review on line at: http://www.waterboards.ca.gov/sanfranciscobay/public_notices/401/dutra/index.shtml.

Comments on the Application will be accepted by the Water Board for 21 days, and may be submitted via email to: xavier.fernandez@waterboards.ca.gov, or by sending hardcopies to: 1515 Clay St., Oakland, CA, Suite 1400, to the attention of Xavier Fernandez. **Comments on the Application must be submitted no later than January 1, 2015.**

If you have any questions or concerns, please contact me via phone at 510-622-5685 or email at xavier.fernandez@waterboards.ca.gov.

Regards,

Xavier Fernandez

Environmental Scientist

SF Bay Regional Water Quality Control Board

510-622-5685

xavier.fernandez@waterboards.ca.gov

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Meredith Wilensky

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March 24, 2015 Via E-mail

Keith H. Lichten, Chief, Watershed Management Dvision
Xavier Fernandez, Environmental Scientist
California Regional Water Quality Control Board,
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612
Keith.Lichten@waterboards.ca.gov
xavier.fernandez@waterboards.ca.gov

Re: Application for Water Quality Certification for Dutra Haystack Asphalt Plant Project, Sonoma County - CIWQS Place ID 767268, Corps File No. 28104N

Dear Messrs. Lichten and Fernandez,

On behalf of the Petaluma River Council, Friends of Shollenberger Park, and Moms For Clean Air, my office has retained expert coastal ecologist Dr. Peter R. Baye to review the application and accompanying documents submitted by Dutra Group, Inc. for a Section 401 certification and issuance of waste discharge requirements for its proposed asphalt production plant and adjoining mitigation wetlands proposed to be located near the shore of the Petaluma River at the gateway to the City of Petaluma and immediately across the river from Shollenberger Park.

The Petaluma River Council and many other Petaluma residents have maintained a steadfast opposition to the Project for the last seven years. As Dr. Baye's attached review indicates, even with many years to get its proposal in order, Dutra still continues to overlook serious technical and scientific problems with its proposed Project. The application for constructing wetlands adjacent to the Project omits numerous fundamental components necessary to a determination of the feasibility of that portion of the Project, including for example any articulated strategy to battle invasive weeds. The prior wetlands delineation by the Corps and biological assessments are out-of-date and necessary biological surveys have not yet been completed. In addition, the application and wetlands plan fails to consider the impacts of the Project's emissions of pollutants in both storm water and to the air on the proposed wetlands, fails to address the Project's potential to release acid sulfate and biologically available heavy metals, including methylmercury, fails to address wildlife impacts of pumping water from the Petaluma River to the project site, fails to establish any ability to alter or maintain a third-party railroad's culvert restricting tidal flows to the site, fails to take sea level rise into account, and includes unrealistic tree planting schemes. Each of these concerns, as well as others, is detailed in Dr. Baye's review. Because of these overwhelming shortcomings in Dutra's application, Petaluma River Council, Friends of Shollenberger Park, and Moms For Clean Air respectfully request that

the Regional Board deny Dutra's application for 401 certification and waste discharge requirements.

Please let me know if you have any questions. Thank you for your consideration of Dr. Baye's review and my clients' ongoing concerns questioning the wisdom of constructing and operating a proposed asphalt plant at that location.

Sincerely,

Michael R. Lozeau
Lozeau Drury LLP
Attorneys for Petaluma River Council, Friends of Shollenberger Park, and Moms For Clean Air

cc (via e-mail):
Bryan Matsumoto, bryan.t.matsumoto@usace.army.mil
Holly Costa, holly.n.costa@usace.army.mil
Jane Hicks, jane.m.hicks@usace.army.mil

Attachment: Peter Baye, Ph.D., Environmental assessment of Dutra Haystack Asphalt Plant Project wetlands impacts, mitigation, and alternatives, Petaluma, Sonoma County, California

ATTACHMENT

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

(415) 310-5109

baye@earthlink.net

M E M O R A N D U M

To: Michael R. Lozeau, Lozeau | Drury LLP (510) 836-4200 michael@lozeaudrury.com

Cc: David Keller, Petaluma River Council dkeller1@sonic.net

Date: March 20, 2015

SUBJECT: Environmental assessment of Dutra Haystack Asphalt Plant Project wetlands impacts, mitigation, and alternatives, Petaluma, Sonoma County, California (Corps File Numbers 28104N, 27798N)

I have reviewed past and current versions of the Dutra Haystack Landing Asphalt Plant Project descriptions, environmental assessments, and wetland mitigation plans (see documents reviewed and cited, below). I have prepared the following critical review of the feasibility of the current (2014 version) wetland mitigation plans, and have re-assessed selected aspects of the project's wetland environmental impacts from previous reports cited below. In addition, I have provided a regulatory assessment of the current alternatives analysis provided by the applicant in the Regional Water Quality Control Board 401 water quality certification application from 2014. My findings, analyses, and conclusions are presented below.

1.0 Wetland mitigation feasibility constraints

The feasibility of the proposed on-site wetland mitigation plan (Monk *et al.* 2014) is significantly constrained by multiple fundamental problems that are not addressed in either the original or 2014 revision of the wetland mitigation/monitoring plan. These problems arise principally from conflicts between the mitigation plan goals and environmental setting (the on-site location of mitigation wetlands directly adjacent to the proposed asphalt plant sources of emissions and runoff) or as a result of technical wetland restoration/enhancement design defects affecting wetland vegetation, soils, wildlife habitat, and hydrology.

The proposed wetland mitigation plan is unlikely to offset the project's overall wetland impacts in either the short-term (within 5 year monitoring period) or long-term (>5 yr monitoring period), especially for wetland habitat functions. These constraints on wetland mitigation feasibility are outlined below, and explained in further detail in sub-sections that follow:

Water and sediment quality constraints on wetland mitigation feasibility

- Water/sediment quality impacts of asphalt plant stormwater runoff, subsurface discharges, and asphalt plant emission fallout;
- Chronic, cumulative deposition of contaminants and macronutrients (including phosphorus) from adjacent asphalt plant emissions.
- Incompatible competing uses of the wetland mitigation site's muted tidal ditch network for industrial stormwater drainage, water intake (dust control water consumption);
- Significant risks of developing significant adverse wetland substrate conditions, including potential acid sulfate soil formation in brackish seasonal wetlands, and release of biologically available heavy metals, including methylmercury;

Wetland restoration and management constraints on wetland mitigation feasibility

- Basic tidal hydrological controls of the ditch system and mitigation wetlands are constrained by a degraded undersized railroad culvert that is not demonstrably under the control of the applicant or its agents, and is likely not available for rehabilitation;
- Cumulative impacts of sea level rise adversely affecting mitigation wetland hydrology and proposed wetland mitigation habitat objectives, including significant reduction in drainage, increase in backwater flooding during high tides and storm runoff events, elevated groundwater, and increased tidal wetland flooding.
- Conflicts between ditch maintenance disturbances, use of muted tidal ditches for water intakes, and management of wetland wildlife and major wetland weeds;
- Fundamentally inadequate substantive management measures for invasive wetland and transition zone plant species, likely resulting in permanent dominance by multiple wetland weeds;
- Infeasible planting design features that would predictably result in failure to establish at least some of the native plant species wetland habitats proposed.

1.1. Contaminants and nutrient loading constraints

1.1.1 Water/sediment quality impacts of the asphalt plant operations on mitigation wetland habitat quality

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The DEIR's hydrology and water quality chapter clearly identifies significant new sources of pollutants from emissions and runoff from the asphalt plant that would subject the adjacent mitigation wetlands to deposition of contaminants. Stormwater runoff transport would occur through the drainage ditch system within the wetland mitigation area after only filtration through sand. Contaminants would also be deposited in mitigation wetlands by direct fallout from plant emissions (particulates, aerosols). The DEIR explicitly identifies the

ditch system running through the mitigation wetlands as a source of sediment and pollutant detention that would trap contaminants including petroleum hydrocarbons, heavy metals, pesticides and nutrients. Contaminants expected to occur in storm runoff from the project area include petroleum products (diesel, asphaltic oil, No.2 fuel oil, gear Lube, motor oil, waste oil, used oil filters and grease; CSW/Stuber-Stroeh draft Stormwater Pollution Prevention Plan 2014), and heavy metals (EIR V.G pp. 17-18).

There is no mitigation or monitoring proposed in either the DEIR (2008) or wetland mitigation plan (2014) to minimize cumulative deposition of contaminants within the mitigation wetland ditch system and constructed seasonal wetland basins to less-than-significant levels with respect to wetland wildlife receptors (ecotoxicity) or RWQCB dredge sediment screening criteria for cover sediments (the most applicable standards for constructed wetlands within baylands).

No surface treatment or subsurface treatment water quality wetlands is proposed to biogeochemically process runoff between the industrial site and mitigation wetlands. In fact, the DEIR actually proposes that the ditches themselves – the wetland channels that run through the mitigation site -- would function to be receptors (sinks) for runoff contaminants: "the ditch would serve as an extended detention basin during low and moderate runoff events". The wetland mitigation plan identified the hydrologic connectivity between the ditch system and mitigation wetlands (Monk & Associates 2014, p. 40; DD1, DD2 and DD6). This is a basic unresolved wetland functional conflict between the DEIR and the wetland mitigation plan: water quality treatment wetlands (contaminant sinks, biogeochemical processing of contaminants) and wildlife habitat wetlands as compensatory mitigation within the same mitigation site. The mitigation plan provides no reasonable explanation of how these conflicting objectives can be achieved together.

Contaminant attenuation of stormwater runoff entering the mitigation site would occur only through a simple catch basin and sand filter system, designed only for a 10-year flood event. The catch basin/sand filter would trap runoff particulates in stormwater, with water clarity as the only water quality criterion (EIR V.G p. 21: "A pretreatment catch basin and sand filter (or multiple basins and filters) that will capture and treat all runoff from all processing and storage areas for at least the 10-year design storm event…). The "below-ground catchment basins" and sand filters proposed are not proposed to remove dissolved contaminants, but only particulate (solid) contaminants. This deficiency in stormwater water quality treatment leaves the partially tidal to non-tidal ditch system within the mitigation wetlands to act as a supplemental stormwater treatment wetlands and detention system for trapping excess dissolved or colloidal suspended contaminants:

> The operation of the new and recycled aggregate storage and processing facilities and asphaltic concrete plant **would introduce new potential sources of water quality degradation at the project site. The project proposes the storage of hazardous materials, including heated asphalt, which could be accidentally released to the surface and subsurface**. Intensified land uses at the project site would result in

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> **increased** vehicle use and potential discharge of associated pollutants. Increased numbers of vehicles and outdoor parking facilities at the project site would **likely result in increased leaks of fuel, lubricants, tire wear, and fallout from exhaust, which would contribute petroleum hydrocarbons, heavy metals, and sediment to the pollutant load in runoff being transported to receiving waters. Runoff from landscaped areas at the site may contain residual pesticides and nutrients.** ….runoff from the asphalt plant area of the site would be directed into a **below-ground catchment basin** designed to provide for **settlement of larger solids** entrained in runoff. Discharge from the basin would pass through a **sand filter** prior **to flowing to the vegetated drainage ditch DD6 at the western margin** of the site. **The ditch would serve as an extended detention basin during low and moderate runoff events**. …**settlement of suspended sediments (and associated contaminants such as hydrocarbons and metals) would occur within the ditch. Runoff from the aggregate storage area would primarily drain westward to DD5, which would also be operated as an extended detention basin**… (DEIR V.G 17-19)

The DEIR's analysis of asphalt plant (aerial) emissions on wetlands was limited to deposition and accumulation in tidal wetlands of the Petaluma River, which is a dispersive (tidal) environment. But neither the DEIR nor the wetland mitigation plan assessed the deposition of asphalt plant emissions into closed, undrained basins of non-tidal seasonal depressional wetlands in the mitigation site, where they may be trapped and accumulate. Contaminants cumulatively deposited in the drainage ditch system may be remobilized during storm events that flood the ditches, overtop their banks or internal levees, and flood into the constructed seasonal wetland basins. Additional pulses of contaminants may be directly deposited from runoff during extreme storm events, and from direct fallout deposition when wind directions align between the asphalt plant and adjacent on-site mitigation wetlands:

> Plant emissions could include particulate matter (PM) containing contaminants, including **polynuclear aromatic hydrocarbons and metals. Some of these emissions may** settle directly into the River (atmospheric fallout) or **be deposited on the land surface…**
> (DEIR V.G. p. 17-18; bold added for emphasis)

The cumulative loading of contaminants and nutrients from storm runoff and aerial deposition discussed above does not even account for larger accidental spills that may occur during decades of asphalt plant operation.

The wetland mitigation plan does not account for storm flood events that would remobilized deposited contaminants in ditches, overflow ditches, and discharge contaminants into closed depressional wetland swales and pools in the mitigation site. The mitigation plan similarly fails to account for the fate of contaminants that enter the mitigation site (accumulation, evaporative concentration, biomagnification, biogeochemical transformation, microbial decomposition, volatilization, etc.). The wetland mitigation plan proposes no corrective

measures or thresholds for action to address contaminant issues, even for the most predictable (petroleum hydrocarbon, heavy metal) contaminants.

1.1.2 Nutrient loading: phosphorus and nitrogen.

Nitrogen and phosphorus are macronutrients that are either limiting or co-limiting for primary production in wetlands. High nutrient levels in wetlands are associated with dominance (low diversity) of relatively few, highly competitive and productive plant species, including non-native invasive species. Eutrophication of ponded, warm water by added phosphorus and/or nitrogen is also associated with harmful algal/cyanobacterial blooms, including ecotoxic *Microcystis* blooms. The DEIR analyzed impacts of phosphorus deposition from the asphalt plant on nutrient-impaired tidal wetlands of the Petaluma River, but it failed to assess impacts of phosphorus deposition into non-tidal, depressional (seasonal pool or marsh) mitigation wetlands adjacent to the source of phosphorus emissions:

> Based on the air quality analysis conducted for this DEIR, the proposed asphalt plant would produce phosphorus emissions…. the RWQCB has determined that the assimilative capacity of the Petaluma River system has already been exceeded for nutrients…(DEIR V.G p. 19)

High temperature combustion sources, like that of the asphalt plant, produce reactive oxides of nitrogen, which can precipitate as biologically available forms of nitrogen, such as nitrite and nitrate. Neither the DEIR nor the mitigation plan assessed the potential cumulative effects of nitrogen deposition from the local and subregional sources: the asphalt plant, its landscaped areas, highway 101 and local roadsides, inflows from the Petaluma River during extreme high tides (including local nutrient loads from septic leachate, cumulative with wastewater treatment discharges upstream) and runoff from landscaped areas into the drainage ditch system that would occasionally flood the mitigation wetlands.

Given the multiple sources of potential co-limiting macronutrients from the asphalt plant, and the drainage connection between the asphalt plant runoff and the mitigation wetlands, there would be potentially significant nutrient loading of the mitigation wetland site once industrial operations begin. The mitigation wetlands would in effect be operating as supplemental nutrient polishing water quality treatment wetlands, whether by design or not. Eutrophication or hypereutrophication of the mitigation site wetlands would likely impair important wetland mitigation ecological functions, including native plant species diversity, carbon sequestration (high nutrients result in relatively higher decomposition rates of soil organic matter, higher turnover of soil carbon), and resistance to invasion by wetland weeds.

1.2 Wetland enhancement and management constraints

1.2.1 Wetland weed invasion and dominance

The invasive species "control" measures and "maintenance" provisions of the wetland mitigation plan and management plan (Monk *et al.* 2014 pp. 63-64; McMillan 2011, 2014) are so brief, vague, purely programmatic, and deficient in site-specific and species-specific management actions that they are for all practical purposes useless for implementation or feasibility assessment. They lack any feasible, substantive strategies or sufficient information to develop a wetland vegetation management plan that includes weed management.

The wetland mitigation plan and management plan fail to provide any evidence-based, science-based assessment of what specific wetland weed invasion pressures and threats exist for the site (species invasion threat and impacts, colonization potential, size and location of source populations, relative magnitude of seed dispersal rates), screening of feasible species-specific management approaches (preemption, managed competition, litter mat development, long-term endowment for recurrent weed management). The mitigation plan fails to assess weed populations from adjacent sites or roadside ditches and banks (seed rain potential, dispersal along disturbed roadsides (by vehicles) and railroad tracks (by trains) dispersal), emerging invasions in seasonal wetlands along the Highway 37-101 wetland corridor (Petaluma- Novato vicinity) that are likely to pose invasion risks at the site when routine vehicle traffic for the operating asphalt plant begins.

The mitigation plan allows "success" of the wetland mitigation "enhancement" to be met by 80% cover of "wetland indicator" vegetation within 5 years, regardless of whether it is dominated by noxious non-native invasive species (Monk *et al.* 2014 p. 56). This is an unacceptable and unreasonably permissive ecological standard for wetland habitat quality. The plan provides no model or reference system of seasonal wetlands (natural or otherwise) to set reasonable standards for performance at 5 years or beyond. It is extremely unlikely that any seasonal wetland would stabilize vegetation in only 5 years, so a 10 year monitoring period (with "skip" years after the first 3) would be needed to confirm the actual successional trend of the wetland mitigation site.

The wetland weed control measures in the mitigation plan are limited to three annual monitoring visits during the 5-year monitoring period, citation of a management plan (McMillan 2011; superseded by McMillan 2014, essentially the same information) and reliance on presumed resource agency expertise and guidance:

> Any methods that are allowed by CDFW and are cost effective and have the least impacts to site biological resources will be implemented. Preferred methods for removal would be hand removal or targeted use of herbicides specifically those designed for use in sensitive wetland areas in the mitigation areas. Small mowers or weed whackers may be used on adjacent buffer zones dominated by upland grasses as long as native plantings are not affected. (Monk *et al.* 2014 p. 64)

The McMillan management plan (2011) is similarly lacking in any substantive detail about wetland weed or overall vegetation management, except for an offhand, arbitrary mention (p. 13) of three species (one of which, *Polygonum arenastrum*, is a marginal wetland plant and

not a significant threat). The plan presumes that California Department of Fish and Game would somehow prescribe what methods should be used to control weeds. This is an unreasonable expectation, because CDFW staff are not responsible for instructing wetland consultants on how to develop weed control plans for wetland mitigation, and few staff have expertise in seasonal wetland weed management in brackish diked baylands. In fact, most brackish seasonal wetland management expertise at CDFW is for managed waterfowl wetlands in Suisun Marsh (Grizzly Island), which actively floods and drains diked wetlands, disks them, and affirmatively manages for non-native brackish weeds that produce seeds favored by ducks. "Weed" management in Suisun seasonal wetlands is primarily aimed at perennial tall emergent plants like reeds, cattails, and tules, regardless of whether they are native or not. The mitigation plan fails to provide or cite even basic methods for seasonal wetland weed management, both in the short-term (5 year monitoring period proposed) and in the long-term.

The proposed purely programmatic "control" of non-native cordgrass (hybrid *Spartina alterniflora x foliosa*; Monk et al. 2014 p. 57) likewise improperly transfers responsibility for controlling invasion of the mitigation site to the Invasive Spartina Project (ISP) of the California Coastal Conservancy. Hybrid cordgrass cannot invade seasonal non-tidal wetlands, but is likely to invade tidal ditches that are periodically disturbed, particularly during more saline years. The ISP is not expected to operate indefinitely, and it does not publicly fund the maintenance of private wetland mitigation sites that create new hybrid cordgrass nuisances. This responsibility falls to the private landowner/manager of the mitigation site.

The proposed grading of the wetland basins would predictably result in rapid invasion by mostly non-native wetland weeds unless either water or seed banks are manipulated to favor early dominance of native target species with high competitive ability. The seasonal wetlands are at very high risk of becoming invaded and permanently dominated by perennial pepperweed (*Lepidium latifolium*), a clonal perennial species widespread in Petaluma Marsh. Its seedlings colonize disturbed brackish mineral soils exposed to light, but are inhibited by dense leaf litter canopies or mats of perennial native species such as saltgrass, creeping wildrye, field sedge, or alkali-bulrush. Similarly, Mediterranean tarweed (*Dittrichia graveolens*) has spread rapidly along Highway 101 roadsides, and has rapidly invaded all brackish marsh restoration sites (tidal or seasonal) in Petaluma and Novato to some degree in the last decade. *Dittrichia* also represent a threat of permanent invasion in disturbed seasonal wetland sites lacking dense litter mats or perennial grassland/sedge meadow canopies. Australiasian bentgrass (*Agrostis avenacea*) has also rapidly invaded both ditches and brackish to oligohaline seasonal pools and ponds along the Highway 37 corridor in the last decade, and is highly likely to migrate up the Petaluma River wetland corridor. These significant wetland weed threats each require non-programmatic, substantive strategies for pre-emption (exclusion) and contingencies for prompt control during the formative stages of seasonal wetland vegetation establishment in the mitigation plan.

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In addition, more common wetland weeds including brass-buttons (*Cotula coronopifolia),* bird's-foot trefoil *(Lotus corniculatus),* hyssop-leaf loosestrife *(Lythrum hyssopifolium),* and rabbit's-foot grass (*Polypogon monspeliensis*) are likely to have very large seed banks on site or nearby, and should be expected to dominate post-grading conditions unless counteractive measures are taken. Actively establishing clonal perennial native sedges and forbs that can out-compete these short-stature or shallow-rooted weeds is probably the only long-term solution to managing them. No vegetation management actions aimed at weed population control are included in the mitigation plan, however. The mitigation plan's statement that "Non-native plant species occurring in the proposed mitigation areas will be eradicated by hand or mechanical clearing" (Monk et al. 2014 p. 62) is flatly infeasible, since neither mechanical nor manual clearing will have any significant effect on weed seed banks, and have no chance at all of "eradicating" them.

The mitigation plan also fails to consider the indirect weed invasion-facilitating effects of routine dust control at the asphalt plant on peripheral populations of weedy halophytes (salt-tolerant weeds) adjacent to the mitigation site. Dust control based on proposed 10-20 thousand gallons per day brackish water irrigation would likely cause salt-tolerant weed populations to increase significantly in banks and ditches peripheral to the asphalt plant. Dust management based on brackish irrigation is likely to pose permanent high salt-tolerant weed invasion pressure on the mitigation site, which is located in the lee of strong northwest winds.

1.2.2 Establishment of native wetland vegetation

The "target vegetation" for the seasonal wetlands is not actually defined at a species level or plant community level in the wetland mitigation plan. There are no affirmative species composition targets or rejection criteria based on native plant communities in the wetland mitigation plan. The wetland mitigation plan merely states broadly that

> Plants found in the seasonally inundated wetland will include a variety of species, including brackish and salt-tolerant species…Species expected to colonize the seasonally inundated wetland will include rushes *(Juncus* spp.), sedges (*Carex* spp.), salt grass, fat hen (*Atriplex triangularis*), pickleweed, and non-native, naturalized wetland species such as bird's foot trefoil (*Lotus corniculatus*), rabbit's-foot grass (*Polypogon monspeliensis*), and sand spurrey. (Monk et al. 2014 p.

The wetland mitigation design fails to provide even minimum baseline and design information for a feasible wetland vegetation establishment process, and four species mentioned casually in the above "target vegetation" are in fact non-native wetland weeds, which are not appropriate to include as objectives. The mitigation plan mistakenly identifies a widespread non-native salt-tolerant annual weed *Atriplex prostrata* (syn. *A. triangularis*) as a native plant.

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Nowhere in the mitigation plan is there any information on the species of *Juncus* or *Carex* (rush, sedge) that are "expected" to colonize the site, or whether adequate seed parent populations exist on the site or near it, or whether there is any evidence that they actively colonize disturbed, graded seasonal wetlands. In fact, there are only two native sedge species in the North Bay region capable of colonizing oligohaline (fresh-brackish) seasonal wetlands: *Carex praegracilis* (field sedge) and *C. barbarae* (basket sedge), and neither of them is known to occur anywhere near the project site on the northwest side of Petaluma Marsh; it is very unlikely that they are present on the site. Furthermore, both these sedges rarely establish new colonies from seed, grow very slowly by rhizome spread, and are at a severe initial disadvantage in competition with the superabundant non-native fast-growing wetland weeds already present at the site. They would require propagation and active transplanting of sods or plugs in order to establish at all, and the mitigation plan does not include specifications for their planting.

Similarly, the mitigation plan provides no information on the identity of rush species or whether or how they would establish. Only a few native rush (*Juncus*) species contribute to seasonally wet meadow vegetation in fresh-brackish North Bay seasonally saturated or flooded soils, namely *J. balticus* (syn, *J. arcticus*), *J. phaeocephalus, J. xiphioides*, and the annual *J. bufonius*. Of these, only *J. balticus* and *J. bufonius* are likely to be present in edges of tidal marshes near the site, and only *J. balticus* would be a viable candidate for co-dominance in target vegetation. Like the perennial sedges, *J. balticus* would require vegetative propagation and active transplanting with at least initial weed suppression to establish successfully. One of the most highly feasible, widespread, competitive, native species for alkali wet meadow vegetation is creeping wildrye (*Elymus triticoides*), which frequently co-occurs with saltgrass and alkali-heath. Populations of this species do in fact occur commonly in floodplains and baylands around Petaluma Marsh. But *E. triticoides* species is not even identified as a component of the target community.

Another basic error on native "target" species is the specification for seeding California sea-lavender (*Limonium californicum*), and marsh gumplant (*Grindelia stricta* var. *angustifolia*) in "the transition zone between the enhanced seasonally inundated wetland and the upland areas" (Monk *et al.* 2014 p. 53), along with alkali heath, salt grass, "to enhance native species establishment and improve colonization of the transition zone by target plant species". Both sea-lavender/marsh rosemary and marsh gumplant are obligate tidal marsh species, and do not naturally occur or persist in non-tidal seasonal wetlands that desiccate in summer. Marsh gumplant would require cultivation (irrigation) to establish in competition with seasonal wetland vegetation that tolerates summer desiccation, and this would be both inappropriate and infeasible.

With the exception of saltgrass and pickleweed in relatively saline depressions, the "enhanced" graded seasonal wetlands would likely be overwhelming dominated by wetland weeds rather than "target" vegetation, with the exception of non-native "naturalized" weeds that were inappropriately included as objectives of target vegetation.

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In summary, the wetland mitigation plan's specifications for seasonal wetland "target vegetation" are woefully incomplete, factually and technically unsound, and infeasible. As proposed, the plan's implementation would likely result in a low-quality, weed-dominated seasonal wetland with poor prospects for rehabilitation at the end of the 5 year monitoring period.

1.2.3 Upland tree "buffer" planting design

The proposal to create an upland tree "buffer" planting (2.54 acres) adjacent to the wetland mitigation area (Monk *et al.* 2014 p. 55) fails to consider the potential growth rates of trees and shrubs at this location, and the feasible attainable sizes of trees and shrubs within the project life. It also fails to address soil salinity constraints caused by salt-laden dust, salt spray drift, and salinized fall runoff from the asphalt plant, which will have daily dust control during the dry season using irrigation of brackish water from the Petaluma River.

The native trees proposed for the buffer include coast live oak, *Quercus. agrifolia*, and Fremont cottonwood, *Populus fremontii*. Coast live oaks growing vigorously on levees at Bahia (Novato) have attained a maximum height of about 2.5 meters after nearly three decades. The rooting zone for coast live oaks is likely to be constrained by even slightly brackish groundwater, which is reported to occur on the site (Balance Hydrologics 2004). The species naturally develops a low, rounded crown on windy, exposed bayland-upland borders. Large coast live oaks growing on uplands, with non-saline groundwater tables below them, are mostly old historic trees. It is very unlikely that any planted coast live oaks bordering the mitigation site in "upland" bayland soils or levees could achieve significantly more than 3 meters in height (about 10 ft) by 2050 even if soil conditions were favorable. In all likelihood, however, oak growth would be stunted by salt spray and saline dust from the asphalt plant due to brackish water irrigation in dust control. The residual soil salinity in local levee substrate may also be a significant constraint on growth, and additional salt deposition would exacerbate it. The value of oaks as components of tree buffers in a reasonable time period (project life) is very doubtful.

Fremont cottonwoods are by contrast fast-growing riparian trees in suitable soil conditions. They do not naturally occur in riparian zones near the Petaluma River, however. They obligate freshwater riparian trees, and are not tolerant of salinized soils or shallow brackish groundwater. Their growth and vigor would likely be significantly impaired by even slightly saline soils, particularly during droughts early in establishment. Thus, their value as tree buffers within a reasonable time period is also doubtful.

California blackberry (*Rubus ursinus*) is a nearly prostrate shrub in open vegetation, and so it would have no meaningful "tree buffer" function other than a ground cover. It also grows as a stunted nearly prostrate shrub less than 0.5 m high in marginally fresh-brackish stressful soil conditions.

California black walnut would similarly require decades to attain a significant size to provide a tree buffer function. This species also does not naturally occur in riparian woodland near the Petaluma River or elsewhere in the North Bay; it is primarily native to freshwater riparian levees of the Delta, and was introduced historically to other river valleys in Central California. Its growth would also likely be slow and stunted if planted on slightly saline levees with shallow brackish groundwater.

Elderberry (*Sambucus nigra*; syn. *S. mexicana*) is more tolerant of alkali to slightly brackish soils than the other woody species listed in the tree buffer planting plan. It does establish naturally in some tidal riparian woodland edges of San Pablo Bay and Suisun Marsh, but it grows as a sparse slow-growing tall shrub (less than 4 meters, even very old specimens) lacking a significant "tree buffer" structure.

The two proposed "buffer" species that are highly feasible to grow vigorously and rapidly on the "upland" soils and levees of the mitigation site edges are low shrubs, not trees: coyote-brush (*Baccharis pilularis*) and California rose (*Rosa californica*). They are prone to dieback during droughts, and cannot attain heights over about 2 meters.

Therefore, the proposed mitigation functions of the "buffer" plantings are infeasible in relation to the project lifespan, the existing soil conditions, and future dust control-influenced salinized environmental conditions.

1.2.4 Ditch maintenance and disturbance

The DEIR proposed routine maintenance of the ditches that drain the asphalt plan and mitigation wetlands, involving excavation of sediment and vegetation; recurrent disturbance:

> *Wetland Maintenance*
> The project proposes the enhancement of existing wetlands (including drainage ditch DD4) in Area D of the site. Maintenance of existing drainage ditches DD1, DD2, DD3, DD5, and DD6 as vegetated drainage channels is also proposed….(DEIR V.G p. 16)

Permanent ditch maintenance is not a sustainable wetland restoration design. The routine excavation and side-cast spoil disturbances associated with ditch maintenance within the wetland mitigation site present multiple conflicts with wetland habitat quality for wildlife. First, recurrent disturbance of anoxic brackish tidally-influenced (relict or modern) fine sediment results in flushes of nutrient-rich sediment (anoxic sediment enriched with ammonia, reduced metals, and phosphates, oxidized when side-cast excavated spoils are drained) with reduced competition by dominant plants, and exposure of mineral sediment to light. Ditch spoils that are periodically disturbed become permanent seedling nurseries for many noxious brackish wetland weeds in the Petaluma River baylands, including perennial pepperweed (*Lepidium latifolium*) and Mediteranneann tarweed (*Dittrichia graveolens*), and Australiasian bentgrass (*Agrostis avenacea*), as discussed above (wetland weeds). Weed

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propagule pressure (intensive local seed rain) from ditches would therefore provide strong local invasion pressure on mitigation wetlands long after the 5 year monitoring period ends.

In order to manage wetland weeds along maintained ditches, disturbances in ditches would need to be minimized in both extent and frequency (recurrence interval) to rare, small events. Active revegetation of exposed excavated mud, using native plants, would be necessary to pre-empt weed seedling habitat formed by ditch maintenance. Intensified weed management would need to follow each episode of ditch maintenance for several years, until native stands of closed-canopy marsh vegetation recover, and again provide strong competitive interference with wetland weed seedlings. None of these provisions are even considered in the wetland mitigation plan, let alone integrated in an implementation plan. The potential for compatibility between routine ditch maintenance for project site stormwater drainage, and long-term wetland habitat mitigation management, is low.

Ditch maintenance also has potential impacts on the biological availability of methylmercury and other heavy metals, which are not addressed in the wetland mitigation plan or DEIR. Anoxic, sulfidic ditch sediments excavated and placed on seasonally drained banks will oxidize, acidify, and liberate metals that were previously bound in stable forms like sulfides. Ditch maintenance is in effect a biogeochemical "pump" for metals that would otherwise be sequestered in vegetated sod-stabilized ditch beds and unavailable to wildlife. This potential significant impact is not mitigated in the DEIR or wetland mitigation plan.

1.2.5 Sea level rise and culvert constraints affecting mitigation wetland hydrology (drainage, backwater flooding, and groundwater levels)

The wetland mitigation plan fails to assess the long-term sustainability of the designed seasonal wetland hydrology, which is constrained by the dilapidated railroad culvert providing unreliable muted tidal drainage to the mitigation site, and which will be further impaired by accelerated sea level rise. The 2004 Preliminary Hydrologic Evaluation (Balance Hydrology) did not address sea level rise, and it was prepared before currently accepted sea level rise models were available. The DEIR clearly identified the general hydrological impacts of sea level rise for the asphalt plant project, but not for its mitigation wetlands:

> One effect of sea level rise will be that receiving waters *[sic]* surface elevations would be higher than under existing conditions, which would decrease available coastal floodplain storage volumes and conveyance capacity, potentially exacerbating backwater flooding effects. The result would be that lesser storms may result in what are currently classified as 100-year storm events, resulting in more frequent and severe flooding….for the duration of the life of the project (until about 2050). If sea levels rise dramatically faster than anticipated… [DEIR V.G p. 9]

The DEIR uncritically assumed that the railroad culvert providing choked tidal drainage to drainage ditch DD1 would be available to the project proponent to rehabilitate in order to achieve long-term hydrological management of wetlands, and stormwater drainage:

> The hydraulic system for the wetland area is connected to the Petaluma River at only one point, the Railroad Culvert. As demonstrated in the hydrology report for the wetland plans, the culvert restricts tidal flow onto the project site. The condition of the culvert has not been investigated. The project also involves pumping River water from drainage ditch DD1, west of the culvert. If the culvert partially or fully collapses or becomes otherwise blocked, tidal circulation into the proposed wetlands could be reduced or eliminated. The habitat of the proposed wetlands would be dependent on tidal circulation. Therefore, potential blockage of the Railroad Culvert would be a ***significant*** impact on the proposed project. (DEIR V.G p. 16)
>
> As required by Mitigation Measure BIO-3a(4), the applicant would be required to repair or replace the existing partially blocked culvert under the railroad right-of-way to improve tidal circulation. The function of the culvert shall be maintained for the life of the project. A maintenance program for all culverts shall be developed and incorporated into the site's Storm Water Pollution Prevention Plan (SWPPP). (DEIR V.G p. 17)

Unfortunately, none of the major Petaluma River vicinity wetland restoration projects adjacent to this railroad has been successful in securing the railroad owner's willing cooperation in upgrading or rehabilitating water control structures to be compatible with wetland hydrology restoration during the last 15 years. Not even Sonoma Land Trust's Sears Point Wetland Restoration Project was able to negotiate water control structure improvements to enable diked baylands north of the rail line to be restored, and the farmed wetlands there remain in agriculture today. Neither the DEIR nor the wetland mitigation plan provide any evidence of rights to repair or upgrade the railroad culvert, or willing cooperation of the railroad to allow rehabilitation of the culvert.

Even if the existing wooden culvert could be maintained, the DEIR correctly states that sea level rise during the project life (2050 or longer) may be expected to reach 14 inches or more, resulting in increased backwater flooding of the ditch system during high tides and storm runoff events. This would result in increased flooding of the mitigation wetlands, but sea level impacts interacting with the undersized culvert were not analyzed in either the DEIR or the wetland mitigation plan. Rising sea level would also cause shallow wet-season groundwater levels to rise in equilibrium with sea level, which would affect the hydrology of constructed mitigation seasonal wetland basins. The groundwater in the mitigation site was reported to occur as high as 3.7 ft below ground surface during the late spring (normal dry season; DEIR V.G p. 9), which indicates a likelihood of groundwater interaction (or emergence of groundwater) in excavated "seasonal" wetlands. Rising high groundwater would likely convert "seasonal" wetlands to perennial fresh-brackish (oligohaline) wetlands over time, especially in conjunction with increased backwater flooding due to sea level rise interactions with an undersized culvert.

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Perennial fresh-brackish marsh would have different wetland ecological functions than those set by the current wetland mitigation plan goals and objectives. Thus, as proposed, the wetland mitigation hydrology is likely to be unsustainable and infeasible over the project life, but after the 5 year monitoring period.

1.2.6 Wetland impacts of water diversion and salt accumulation from dust control activities

The project proposes to divert 10,000-20,000 gallons per day (gpd) of brackish estuarine water from two sources: the Petaluma River, "and/or" a tidal "slough" (ditch) in Area C (DEIR V.C p. 23; V.G p. 14). Neither the DEIR nor the wetland mitigation plan quantify the capacity of the muted tidal ditch system to supply even a fraction of this large daily summer demand for water. Instead, the DEIR provides a vague, programmatic and unenforceable mitigation condition (lacking any measurable thresholds) to address wetland impacts of water diversions:

> ***Mitigation Measure BIO-3a*** (5) Ensure that any proposed water diversion for dust control does not adversely affect the feasibility and success of tidal and brackish marsh to be created in Area D. This shall be demonstrated on an annual basis as part of on-going monitoring and maintenance defined in Sections 8 and 9 of the WMMP. Diversion shall be curtailed or an alternative method secured if performance standards and success criteria defined in the WMMP for areas of tidal and brackish marsh are not met due in part or wholly because of the proposed water diversion. (DEIR V.G p. 32)

The mitigation measure identifies no specific monitoring methods or measurable standards that could causally relate impacts of water diversion to shortfalls in ecological performance of mitigation wetlands. Lowering water levels of the ditches would steepen local groundwater gradients along ditch banks. Rapid pumping (40 gpm; DEIR V.C p. 23) would either entrain small aquatic organisms (invertebrates, small fish) smaller than intake screen pore sizes, or would become concentrated around screens. This would significantly interfere with wildlife feeding in the ditch system within mitigation wetlands.

The daily watering of the asphalt plant ground surfaces with brackish water would cause significant salt deposition from evaporation (DEIR V.G p. 15), although the salt load was not quantified for average salinity conditions in summer at the project location. Since even moderately brackish Petaluma River water in summer contains around 25 ppt (2.5% salt; McMillan 2011 p. 8), salt deposition rates on the site during summer would be highly significant. The DEIR, however, analyzed only impacts of "first flush" fall rain saline runoff on discharges reaching fully tidal estuarine marsh (DEIR V.G p. 15), and omitted analysis of saline to hypersaline runoff into the mitigation site ditch system. The wetland mitigation plan does not even identify (let alone mitigate) effects of saline stormwater discharges from fall rains as a wetland management issue.

Hypersaline discharges could cause dieback of non-dormant cordgrass or alkali-bulrush in muted tidal ditches during fall months. If ditches flooded with saline to hypersaline "first flush" runoff spilled over to depressional non-tidal wetlands during major fall storm runoff events, seasonal mitigation wetlands would be salinized, and would probably be reduced to low species diversity of the most salt-tolerant salt marsh plant species (native saltgrass, pickleweed, and non-native spearscale). Because seasonal wetland depressions are undrained (lack outlets for surface flows or salts), the salinization impacts may be persistent and impractical to correct.

1.2.7 Adverse sediment quality risks: acid sulfate soil formation after wetland creation and "enhancement".

Brackish wetland soils that alternate between strong anoxic reducing conditions (flooding, waterlogging) and aerobic drainage conditions (drainage or drying) are prone to develop acid sulfate soils that may cause significant adverse soil conditions, including extreme low pH, excessive availability of free metals, and physiological stress or mortality of plants and wildlife that are intolerant of these conditions. Thus, acid sulfate soils can be a significant constraint on seasonal wetland enhancement or creation in brackish seasonal wetland soils in Petaluma River baylands. The existing seasonal wetland vegetation described in the wetland mitigation plan (Monk *et al.* 2014) is consistent with brackish soil conditions derived from exposure to estuarine salinity, although detailed soil salt content analysis of the site is lacking. Multiple sources of estuarine salinity in sediments include:

> (a) brackish tidal process water in quarry fine sediment (past gravel washing and deposition of quarry fines in settling ponds; Monk et al. 2014, p. 23), deposited in thickness variously described as 3 ft-11 ft (DEIR Hazardous materials V.F p. 2) or 6.5-11 ft thick (Monk *&* *al.* 2014 p. 26);
>
> (b) exposure of excavated Reyes clay (Bay mud) from the underlying original diked tidal marsh soils (Monk *&* *al.* 2014 p. 22);
>
> (c) modern ditch overtopping during high tide back-flooding of ditches during storm runoff peaks (mixing of estuarine water and runoff).

Sulfate is a major anion of seawater, and in anoxic sediments with high organic matter content (residual wetland vegetation below-ground biomass and buried litter), sulfur-reducing bacteria reduce sulfate to sulfides, in the form of reactive hydrogen sulfide gas and relatively stable iron sulfide. Upon drainage, however, iron sulfide deposits in diked bayland soils oxidize and form abundant iron oxide and acid sulfates, often visible as barren rust-colored "red pans" in beds of seasonal pools or ponds. Toxic levels of acid sulfate and free iron (and other metals) can maintain acid sulfate/iron oxide barrens. Local recent examples are known from the Petaluma River baylands. The excavation of natural bay mud at the Petaluma Marsh Expansion tidal restoration project (San Antonio Creek) for construction of

a seasonal wetland supratidal bench resulted in extreme acid soils (pH 2, the lowest ever measured by the local soil testing company) that maintained unvegetated barrens for years. Similar barrens resulted in portions of the Bahia wetland restoration project supratidal seasonal wetlands (lower Petaluma River) after "red pan" sediments were graded.

The soil organic matter monitored in the project's mitigation wetlands (Monk *et al.* 2014 p. 58; DEIR V.C p. 31), plus the alternation between winter-anoxic flooded soils and summer-dry soils of seasonal wetlands, indicates a potentially significant risk of acid sulfate soil formation in the project site's soils, regardless of whether grading exposes quarry fines or Reyes clay as beds of seasonal wetlands. In addition, annual primary productivity (above and below-ground vegetation biomass) would continue to fuel sulfur-reducing bacteria with organic matter, even in the absence of soil organic matter amendments.

Acid sulfate soils may cause persistent deficiencies in revegetation of wetlands by native vegetation, and inhibit plant growth and native species diversity. Some of the most acid-sulfate tolerant and salt-tolerant species are non-native annuals such as spearscale (*Atriplex prostrata*), weedy species of spurrey (*Spergularia* spp.). Mediterranean tarweed (*Dittrichia graveolens*) and Australasian bentgrass (*Agrostis avenacea*), all of which are also major rapid invasive weeds of San Pablo Bay seasonal wetlands in diked baylands (see invasive species, below). Development of acid sulfate soils may make wetland weed control practically infeasible if the primary tolerant species are non-native weeds. In addition, low pH may increase solubility (biological availability) of heavy metals in soils derived from Tolay volcanic and Franciscan metamorphic quarry rock (quarry fines), and stormwater discharges from the asphalt plant.

The cumulative effect of acid sulfate and heavy metal contaminants is difficult to treat with agricultural soil amendments such as lime (calcium carbonate), because undrained fine-grained wetland clay-silt soils do not infiltrate surface applications of lime. Discing wetland soils to force lime penetration would disturb wetland soils and vegetation, and promote weed dominance. Normal seasonal fluctuations between waterlogging and drying of seasonal wetland soils would likely regenerate acid sulfates over time, requiring re-treatment. Only tidal restoration or perennial flooding of wetlands provides permanent correction of acid sulfate soils.

1.3 Summary and conclusions: wetland mitigation adequacy

The conflicts between the water quality treatment functions of the ditch wetlands that extend through the mitigation site, and wetland habitat compensatory mitigation functions, are significant and unresolved. The chronic loading of petroleum hydrocarbons, salts, and other contaminants into the ditch system and shallow groundwater connected to the wetland mitigation site is a substantial burden to manage while maintaining high quality wetland wildlife habitat, and it appears doubtful that reconciling the conflict would be feasible. Since the only drainage outlet to the Petaluma River is the railroad culvert, which would have to be shared between stormwater discharges and mitigation wetland outflows, reconciling

conflicting water quality and habitat objectives is probably infeasible. The on-site wetlands could be designed to function for stormwater treatment efficiency, minimizing exposure of wildlife to attractive nuisances of contaminant-impaired shallow open water with vegetated edges. An efficient perennial surface treatment/subsurface treatment wetland with high shallow groundwater (perennial near-surface soil saturation) would be needed to mitigate potentially significant cumulative and chronic stormwater contaminant impacts of the asphalt plant. This would be incompatible with compensatory habitat mitigation for wetlands on-site.

In addition, the mitigation plan fails to consider the increased salt deposition (spray drift, salt films, salt dust, saline fall runoff) in the mitigation site and its buffer areas due to summer dust control measures using brackish tidal water irrigation at the asphalt plant. The "tree buffer" planting plan is likely to provide only low shrub cover or stunted trees within the project life, due to the physiologically stressful environmental setting in baylands with shallow brackish groundwater and elevated upland soil salinity. The wetland restoration/enhancement design is poised to develop overwhelming dominance by non-native invasive wetland vegetation, and fails to provide even minimal design information to facilitate establishment of feasible native wetland vegetation. The target vegetation inappropriately includes wetland weeds, and success criteria do not set any limits for the proportion of the vegetation that is non-native invasive species.

The failure of the mitigation plan to identify impacts of obvious (explicit in DEIR) contaminant discharges to mitigation wetlands, despite over 10 years of planning and review, raises further questions about the technical adequacy of mitigation planning and scrutiny.

2.0 Wetland Impacts, mitigation, and alternatives

2.1 Off-site wetland Impacts

Many of the same failures to apply the DEIR's hydrological analyses to the wetland mitigation site also apply to the environmental assessment of wetland impacts off-site. This has resulted in numerous underestimates of potentially significant impacts to wetlands off-site, particularly non-tidal wetlands that lack regular tidal flushing, and which may accumulate contaminants or nutrients in relatively closed basins.

For example, the DEIR's assessment of asphalt plant emission fallout (including both aromatic hydrocarbons, heavy metals (DEIR V.G 18-19), and macronutrients like phosphorus; DEIR V.G 19, 23)) may have potentially significant indirect and cumulative impacts on the non-tidal seasonal wetlands of Shollenberger Park. The cumulative impact of these pollutants would require an analysis of the background levels of contaminants and nutrients (cumulative burden) at Shollenberger Park sediments, and an estimate of net deposition of contaminants/nutrients originating at the asphalt plant. This analysis, to the best of my knowledge, has not been performed.

Impacts to special-status wetland species have relied on outdated biological assessments and very limited survey data prepared in a "Biological Constraints Report" for the project prepared in 2003, and recycled with minimal supplemental information in the 2008 DEIR. Subsequent special-status species analyses have simply repeated stale information from reports that are now more than a decade old and unreliable. After a decade of significant climate fluctuations (drought, high rainfall years), new invasive species invasion threats in the Petaluma River wetlands (*Dittrichia gravelolens, Agrostis avenacea;* see 1.2.1 above) and associated changes in habitat conditions, the special-status species conditions have almost certainly changed. Special-status species assessments for the project must be supported by evidence from current surveys, just as previous wetland jurisdictional delineations have expired and must be updated.

It is unlikely that the USFWS would now allow trapping of the salt marsh harvest mouse to supply negative survey data interpreted to demonstrate absence, since this species undergoes movements in response to flooding events, population fluctuations, competition, and changes in habitat distribution and quality. Similarly, the distribution of Ridgeway (California clapper) rails and California black rails along the Petaluma River would require new surveys after a decade of no data. For federally listed species, the "Biological Constraints Report" would need to be revised as a Biological Assessment compliant with Endangered Species Act regulations at 50 CFR §402.08 and §402.12

The DEIR also failed to consider potential impacts to two rare (species of concern) plants that may occur in tidal fresh-brackish wetland edges of San Pablo Bay: *Lilaeopsis masonii,* and *Castilleja ambigua.* The DEIR's assessment of western pond turtle (*Actinemys marmorata marmorata*) underestimates the likelihood of occurrence of this species on basking sites like bare eroded marsh banks and slump-blocks and large woody debris along the Petaluma River, particularly in years of high rainfall and freshwater discharges. Western pond turtles are quite common in some slough banks of Suisun Marsh where salinity range and vegetation is similar to those of the upper Petaluma River (tule and bulrush reaches). The "heavy flow" of the river in winter (Monk *et al.* 2014) is an invalid reason for discounting the suitability of this habitat, since turtles can escape to emergent wetland or terrestrial habitats during floods. No surveys have been conducted for this species at the project site. Potential significant impacts to western pond turtles include river intake pump mortality of juveniles, creation of attractive nuisance habitat at eroded banks near intakes, and discharges petroleum hydrocarbons and other contaminants.

2.2. Wetland mitigation policy issues

The wetland mitigation plan proposes to "decommission" existing compensatory mitigation wetlands that were required by another permit. The proposal cites no regulatory authority or permit agency rationale to do this, and assumes that modification of another wetland permit (USACE/RWQCB) can be done as a matter of discretion. The wetland mitigation plan does not cite any official documentation from the landowner or permittee holding the past

mitigation obligations to transfer liability for failed mitigation to the current applicant. The proposal to "decommission" a presumably established and compliant wetland mitigation site and compensate for it with a speculative new mitigation site is problematic for wetland regulation. First, the exchange causes a net temporal loss of wetland function that is apparently not compensated by a significant increase in wetland function from the new restored/enhanced wetlands. Second, the location-specific wetland functions, like water quality improvement of local runoff, cannot be replicated off-site if drainage patterns are unrelated. Third, the elimination and transfer of wetland mitigation obligations as a matter of private expedience for new wetland fill projects raises serious questions about the security and enforceability of wetland mitigation conditions. The public interest analysis, to balance private and public interests, for decommissioning and transferring mitigation obligations has not been documented.

The mitigation proposal has an additional burden of providing "after the fact" permit mitigation compensating for unauthorized grading and filling of wetlands in 2005, the impacts of which have lacked any corrective enforcement measures for nearly a decade. Permit agencies would need justification for rewarding unauthorized wetland fill with suspension of enforcement actions (and costs) for a decade in addition to the expedience of "decommissioning" independently permit-required wetland mitigation. Neither of these proposed discretionary actions is authorized by the USACE permit regulations governing mitigation or enforcement procedures.

Finally, the proposed wetland mitigation "package" relies heavily on claims of "enhancement" and "preservation" of existing jurisdictional wetland acreage and upland buffers to supplement a relatively low ratio of compensatory (new/restored wetland 2.66 acres) to filled/converted upland wetland acreage (1.37 acres; less than 2:1). As analyzed above, the feasibility of the proposed wetland mitigation plan is low, and it is likely to achieve at best degraded seasonal wetland conditions by and after the 5 year monitoring period.

2.3 Alternatives analysis – 404(b)(1) EPA CWA Guidelines and NEPA

The alternatives analysis provided in the 2014 Section 401 Water Quality Certification application does not comply with the requirements for Section 404(b)(1) Guidelines (40 CFR 230.10) or NEPA. The 401 certification application substitutes the threshold of "suitable" (subjective perspective of the applicant) for the more stringent "practicable" threshold under 404(b)(1) alternatives test. Similarly, it substitutes a general-meaning use of "practicable" for the more stringent and specific test of "least environmentally damaging practicable alternative" in comparing alternative sites.

The alternatives test under 404(b)(1) is based on the presumption that a project proposing fill in jurisdictional 404 wetlands or other special aquatic sites has the burden of showing that no other "practicable" alternatives are available, unless the basic (not overall) project purpose is water-dependent (requiring siting in or adjacent to water). The basic (not overall)

project purpose of the asphalt plant is industrial production of asphalt. This is not a water-dependent basic purpose. The project's overall purpose may include logistical and feasibility aspects such as efficient transport, market/service area, supply of raw materials, land use, etc., but the "water dependency" test is based on basic, not overall purpose. Therefore, under 404(b)(1) alternatives analysis, it must be presumed that a less environmentally damaging alternative to wetland fill exists unless demonstrated otherwise – meaning that the applicant has the burden of demonstrating that no "less environmentally damaging practicable alternative" exists. This is not a general-sense meaning of "practicable"; the term is defined in 404(b)(1) and is supported by case law.

The alternatives analysis fails to define basic "practicability" criteria in an objective way. First, it fails to provide an objective basis for market area or service area to set reasonable bounds to the geographic scope of potentially practicable off-site alternatives. Second, it fails to show the distribution of existing serviceable asphalt plants in the region (including those owned by the applicant), or their sizes (or a minimum size feasible footprint for an asphalt plant). Third, it fails to display the distribution of potentially feasible or available industrial sites that could be used for an asphalt plant. The analysis also fails to justify some (potentially arbitrary and unreasonably narrow) feasibility criteria such as proximity to railroad tracks. Unless all asphalt plants in the region, including the one that the project proposes to replace, were "proximate" to railroad tracks, this criterion for alternatives sites is not reasonable, and is merely a preference of the applicant. In general, the alternatives analysis does not distinguish applicant's preferences from feasibility criteria applicable to any project of the same type. A comparison of trucking and rail transport in terms of environmental impacts and economic viability may be relevant, but there is no justification presented for the assertion that railroad proximity is necessary for a feasible asphalt plant location.

The project's overall purpose is relevant to determinations of "practicability" only. Similarly, pursuant to NEPA regulations and guidance, "reasonable" alternatives – not necessarily those alternatives preferred by an applicant – must be evaluated if they would significantly reduce impacts or increase environmental benefits, even if they are not within the jurisdiction of the permit agency or immediately available to the applicant.

Documents reviewed and cited

Permit applications and supporting documents

- RWQCB Section 401 water quality certification application 12/15/14 and comments
- Dutra Haystack Landing Wetland Mitigation/Monitoring Plan, Monk & Associates *et al.* April 2006 and revised version Nov 2014 (including appendices)
- Draft Environmental Impact Report 2008 (DEIR) (based on old project description and baseline 2003-2005)

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Comments, email, memoranda, letters
USACE official correspondence
USACE/Dutra agent email correspondence

EXHIBIT B

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

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January 15, 2016

Michael Lozeau
Lozeau Drury LLP
410 12th Street
Oakland, California 94607

Subject: Comments on the Dutra Haystack Landing Project Stormwater Impact

Dear Mr. Lozeau:

I have reviewed the County of Sonoma December 14, 2010 Amended Draft Conditions of Approval (PLPO4-0046) for the Dutra Haystack Landing Asphalt and Aggregate Distribution Facility ("Project"). The Project would permit an asphalt batch plant with a maximum production capacity of 225,000 tons per year and an aggregate and sand distribution facility with a maximum capacity of 345,425 tons per year. Aggregate and sand for the facility will be imported through a barge off-loading facility on the Petaluma River and brought by conveyor to the facility. Prior to completion of the conveyor, trucking of materials to the site shall be permitted for a maximum period of three years at which time trucking is to cease.

I am a certified stormwater professional in the State of California and a licensed California Professional Geologist and Certified Hydrogeologist. I have reviewed best management practices at approximately 75 facilities to ensure protection of water quality. I am a former U.S. EPA Senior Science Advisor at the U.S. EPA in San Francisco Region 9 and I have over 25 year of experience in the fields of environmental regulation and consulting.

The following items in the Conditions of Approval are inadequate to effectively control and treat stormwater during operation:

> 47 c. A treatment catch basin and sand filter (or multiple basins and filters) that will capture and treat all runoff from all processing and storage areas for at least the 10-year design storm event.

The proposed "sand filter," as described in the May 13, 2014 Storm Water Control Operations & Maintenance Plan, is not a best management practice (BMP) that achieves the implementation of Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control

Technology (BCT). Implementation of BAT/BCT is a requirement of the California Industrial General Permit (Order 2014-0057-DWQ).

The proposed sand filter is not a BMP technology that would be effective in treating all pollutants that are would be expected from the project. In addition to total suspended solids (TSS), contaminants likely to be generated from pollution sources at the Project include oil and grease from the asphaltic oils and crumb rubber asphalt components. The sand filters, even if fitted with the optional Kristar FloGard Perk Filters as discussed in the Storm Water Control Operations & Maintenance Plan, have not been demonstrated to be effective in treating these contaminants to concentrations below Numeric Action Levels (NALs) as required by the California Industrial General Permit.

If not effectively treated, discharge of total suspended solids above the NALs will further degrade the Petaluma River an impaired water body which is on the most recent 303(d)-list for sedimentation/siltation.[1] Discharge of TSS will add turbidity to the Petaluma River and lead to deposition of sediment, negatively impacting benthic macroinvertebrate populations by decreasing the availability of oxygen-rich water, decreasing access to food, reducing habitat functionality, and limiting reproductive processes.[2] Toxic chemicals and other pollutants, including heavy metals, also adhere to sediment particles. This provides a medium by which toxic pollutants are deposited in waterways and are potentially bioaccumulated. The addition of oil and grease from the asphaltic oils and crumb rubber asphalt components may contain toxic compounds, such as petroleum aromatic hydrocarbons that can adversely affect aquatic life and may form unsightly films that float on water.

I have read the conclusions reached by Peter R. Baye Ph.D. as included in a November 25, 2015 memo prepared for your office. I agree that contaminants from the Project, as described above, may also cause significant degradation of on-site wetlands through comingling of inadequately treated stormwater runoff. Dr. Baye's findings that significant potential adverse impacts to multiple special-status fish, wildlife, and plant species may occur because of drainage of contaminated runoff are also consistent with the findings I present above.

To achieve BAT/BCT and to better protect water resources and wetlands, a more advanced filtration system is required. Systems such as those manufactured and installed by StormwateRx[3] or H2O Stormwater Systems[4] are capable of reducing industrial stormwater contaminants, such TSS oil and grease, to levels which will achieve NALs. For example, attached appendices show applications and performance data for H2O Stormwater Systems.

These BAT/BCT-compliant systems should be engineered for the Project to include a multi-step process including pretreatment (settling and filtration) and advanced filtration stages. The proper design of such a system may include capture and storage of water for later treatment to ensure the capacity of the system is not exceeded.

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[1] http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/00690.shtml
[2] http://www.sfei.org/sites/default/files/biblio_files/Petaluma_IA_submitted_to_RWQCB_April_2010.pdf, p. 10
[3] http://www.stormwaterx.com/
[4] http://www.stormwatersystems.net/

Because of the failure to include BMPs that constitute BAT/BCT, the Conditions of Approval fail to provide necessary safeguards for the protection of the Petaluma River from contaminated stormwater runoff. Safeguards that meet the BAT/BCT requirements of the California Industrial Permit are critical because Project stormwater will discharge directly to the Petaluma River, an impaired water body. Discharge of TSS in stormwater above NALs will further degrade the Petaluma River and will make the achievement of an eventual Total Maximum Daily Load more difficult.

The Conditions of Approval should be amended to require BMPs that constitute BAT/BCT. The amended Conditions of Approval should also require, as an attachment, a Stormwater Pollution Prevention Plan (SWPPP) that demonstrates compliance with the California Industrial General Permit. Such a SWPPP will include all items required by the checklist to the California Industrial General Permit (See Attachments). The Conditions of Approval only currently require the SWPPP to be prepared "prior to commencement of operations" (Item 47). The deferral of the SWPPP to that future date does not provide for the public to the review the SWPPP and its adequacy in providing for BMPs that are protective of the Petaluma River.

Sincerely,

Matt Hagemann, P.G., C.Hg.

EXHIBIT A

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M E M O R A N D U M

To: Michael R. Lozeau, Lozeau | Drury LLP (510) 836-4200 michael@lozeaudrury.com

Cc: David Keller, Petaluma River Council dkeller1@sonic.net

Date: November 27, 2015

SUBJECT: USACE regulatory analysis of Dutra Haystack Asphalt Plant Project, Petaluma, Sonoma County, California: 404(b)(1) factual determinations and alternatives analysis; public interest review (); NEPA and ESA compliance. PN 2003-281040 (former Corps File Numbers 28104N, 27798N)

I am providing my analysis of the U.S. Army Corps of Engineers San Francisco District (USACE; hereafter, Corps) public notice (PN) of the Dutra Haystack (Haystack Landing) Asphalt Plant project, based on the information in the PN, the project EIR, and supporting documents cited. My analysis is based wholly on my independent scientific and technical judgment. My statement of qualifications to provide multi-disciplinary expert comments and analysis on wetlands, aquatic ecosystems, plant ecology, wildlife, and environmental regulations for Corps permits is attached. I have over two decades of field experience and project experience with wetlands of the Petaluma River and adjacent northern San Pablo Bay, including tidal and non-tidal seasonal wetlands like those in the vicinity of the proposed asphalt plant site.

My principal findings include:

- The alternatives analysis submitted by the applicant does not comply with either Corps permit regulations (wetlands, floodplains), Corps NEPA regulations (general alternatives analysis), or EPA 404(b)(1) guidelines.
- The preliminary finding of no significant impacts is not supported by the best available environmental data and analysis. There is substantial evidence that the project would likely cause significant degradation of on-site wetlands, including those proposed as compensatory mitigation. This would likely be the consequence of the incompatible multiple uses of tidal drainage ditches in the wetland complex on site for conveyance of contaminated stormwater runoff (toxins, salts, and nutrients) from the project site, water supply intake (rapid pumping of tidal water) for dust control, and their basic hydrologic connectivity to on-site conserved wetlands, including

mitigation wetlands. In addition, asphalt plant emissions may contaminate water and sediment, and thus wildlife, on site wetlands.

- Significant potential adverse impacts to multiple special-status fish, wildlife, and plant species may occur because of water intakes, drainage of contaminated runoff, asphalt plant emissions, and asphalt plant operation noise. These impacts are neither analyzed nor mitigated. The biological information provided in the project's mitigation plan and EIR (the primary sources of biological impact analysis) appear to be mix of outdated and seriously incomplete environmental baseline information and recent revisions. The quality of the scientific and technical information provided is at best uneven.
- The wetland mitigation plan is basically flawed and infeasible on its own terms. The invasive species management components are infeasible, and there are no affirmative native plant community composition, structure, or functional attributes in the plan to be applied as enforceable objectives or criteria.
- There are some major omissions in the PN regarding the extent of Corps jurisdiction (Rivers and Harbors Act) over components of the project, and omissions in the project description (for example, proposed water intakes in navigable waters of the United States, and "decommissioning" of previously authorized mitigation)

1.0. Environmental Setting and Project Site

1.1. Floodplain. The project's direct, indirect, and cumulative impacts are closely related to the environmental setting of the project site, which is located within derelict agricultural floodplains (diked baylands; historical agriculturally reclaimed, diked tidal marsh) of the Petaluma River. These subsided, partially filled diked baylands of the project site are subject to frequent and increasing flooding as sea level rises. The Corps PN, however, does not identify the sensitive floodplain setting (33 CFR §320.4(l)) of the project site within diked baylands, which is a significant factor for the Corps' public interest review.

Neither the PN nor the most recent version of the wetland mitigation plan assess floodplain values or floodplain management functions (33 CFR §320.4(l)) of wetlands on site, or their hydrological and biological interactions with the tidal wetlands to which they are connected by ditches. The floodplain management values identified by 33 CFR §320.4(l) include "natural moderation of floods, water quality maintenance, groundwater recharge; cultural resource values (open space, natural beauty), living resource values (fish, wildlife, and plant).

Sea level rise will contribute to significant cumulative impacts of floodplain fill and development at the site (increase frequency and duration of floodplain submergence in subsided diked baylands) because of the following hydrologic interactions:

- Increased tidal flooding of the floodplain through the open railroad culvert connecting the tidal slough of the Petaluma River to the interior tidal ditch network within the project site

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- Increased tidal backwater flooding of storm runoff (high tide impoundment; drainage obstruction during high winter tides) at higher elevations due to accelerating sea level rise;
- Reduced duration of ebb tide gravity drainage from the site through the ditch networks as Mean Low Water and Mean Sea Level rise relative to the invert elevation of the railroad culvert.

The wetland mitigation plan (Lynch et al. 2015) does not account for either direct, indirect or cumulative impacts to floodplain values, as required by Corps permit regulations at 33 CFR §320.4 (l)(2) and EPA regulations at 40 CFR §230.10(g). Previous environmental documents (EIR) also fail to assess the foreseeable hydrologic impacts of the project on floodplain hydrology. The impacts of filling and developing otherwise undeveloped subsided floodplains caught between rising sea level and upland runoff are significant. These impacts are closely related to the basic feasibility conflicts between the wetland mitigation design (seasonal wetlands) and accelerated sea level rise.

Therefore, the Corps must assess these impacts in order to comply with its own regulatory requirements: because minor changes may cause cumulative impacts that may result in significant degradation of floodplain values and functions (33 CFR §320.4 (l)(2)), the project's fill of floodplain areas for new industrial land uses should be rigorously analyzed in terms of impacts to flood attenuation, water quality maintenance, groundwater recharge, cultural resource values (open space, natural beauty), and biological resource values (33 CFR §320.4 (l)(2).

The Corps' permit regulations at 33 CFR §320.4 (l)(2) also include an alternatives test and criteria specifically for avoidance of floodplain wetland fill, similar to the "least environmentally damaging practicable alternatives" (LEDPA) test of the 404(b)(1) guidelines at 40 CFR§ 230.10:

> District Engineers...should avoid to extent practicable, long and short term significant adverse impacts associated with the occupancy and modification of floodplains, as well as direct and indirect support of floodplain development *whenever* there is *practicable alternative* (33 CFR §320.4 (l)(2))…….District Engineers….should avoid authorizing floodplain developments whenever alternatives exist outside the floodplain. 33 CFR §320.4 (l)(3)

An asphalt plant does not *require* siting within undeveloped floodplain wetlands as part of its basic or overall purpose. The alternatives analysis for the project (Macmillan 2015) fails to rebut the presumption that no less environmentally damaging practicable alternatives exists for the project in non-wetlands and in non-floodplain sites. The off-site alternatives analysis's basic flaws include:

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- Lack of any explicit and reasonable (non-arbitrary) geographic boundary for the market area (service area) for the asphalt plant, based on industrial and commercial data; no reasonable explanation given for excluding the entire Highway 101 industrial-commercial Highway 101 corridor north of the Petaluma River;
- Arbitrary and unreasonably narrow "practicability" criteria ("criteria for a suitable site" from project proponent's perspective) include proximity next to railroad tracks, despite the existence of commercially viable asphalt plants without close proximity to rail lines;
- No alternative project sites explicitly identified or assessed, including the industrial-commercial Highway 101 corridor south of urban Santa Rosa.

The alternatives analysis fails to rebut the presumption that a less environmentally damaging practicable alternative exists that does not require location in *floodplain* wetlands (33 CFR §320.4(l)(2)) as well as other jurisdictional (40 CFR §230.10(a); §230.5(c)) aquatic sites. The alternatives analysis appears to be a rationalization for the applicant's prior commitment to the project site through the Sonoma County land use approval and CEQA process. This antecedent, weaker CEQA alternatives analysis, based on CEQA standards alone, is inadequate for the Corps' off-site alternatives analyses for floodplain wetlands at 33 CFR §320.4(l)(2) or 404(b)(1) compliance. The alternatives analysis for floodplain fill avoidance must apply criteria sufficient for Corps criteria in 33 CFR §320.4(l)(2) and 40 CFR §230.10.

1.2. Regional Wetland Setting: Significance of Petaluma Marsh Wetlands

The Environmental Setting of the project site contains major regional wetlands with highly significant public interest wetland functions. Petaluma Marsh Wildlife Area (California Department of Fish and Wildlife; 4200 acres) includes the largest prehistoric tidal marsh complex in the San Francisco Estuary and California as a whole, and supports multiple Federal-listed and State-listed wildlife, fish, and plant species (Goals Project 1999, 2015). Shollenberger Park (City of Petaluma; 165 acres), across the Petaluma River from the project site, is a highly visited recreational trail and wildlife viewing area. The mitigation plan's discussion of "the importance of the bay wetland fringe" (Lynch et al. 2015 p. 43) comprises nearly meaningless and vague generalizations about wetland vegetation in the region, and inaccurately characterizes the vegetation of the project site before and after restoration. It does not provide an adequate ecological account of the regional wetland setting, or the relationship to the site's wetlands now or in the foreseeable future.

The potential impacts of the proposed project to these important wetlands (including wetland floodplain) functions and values are public interest factors that must be weighed as part of the Corps Public Interest Review: 33 CFR § 320.4(a) in terms of conservation, recreation, esthetics, visitor-based economic uses, fish and wildlife values, and floodplain management (320.4(5)(l)), including "natural moderation of floods, water quality maintenance, groundwater recharge; cultural resource values (open space, natural beauty), living resource values (fish, wildlife, and plant)", including threatened and endangered

species (40 CFR §230.30), esthetics (40 CFR §230.53), and wildlife preserves and parks like Shollenberger Park and Petaluma Marsh Wildlife Area (40 CFR §230.54). These significant wetland areas plainly lie within the potential effects area of the project site affected by airborne asphalt plant emissions, tidal dispersal of runoff contaminants, fuel spills, noise, visual/esthetic impacts. Thus, Shollenberger Park and Petaluma Marsh Wildlife Area must be identified as potential receptors of indirect project impacts for Corps compliance with NEPA, CWA 404(b)(1), and Corps permit regulations. The Corps should confer with the California Department of Fish and Wildlife and the City of Petaluma to assess potentially significant for indirect impacts to the Petaluma Marsh Wildlife Area.

The Corps should also specifically confer with CDFW regarding impacts of the asphalt plant's proposed water diversion from the Petaluma River and its tributaries (tidal "drainage ditches" interior of the project site), described in the EIR but not disclosed as part of the project description in the Corps PN. Water diversion intake structures in tidal waters are regulated both by CDFW (1600) and the Corps (works and structures in Rivers and Harbors Act Section 10 jurisdiction). The

The Baylands Ecosystem Habitat Goals (Goals Project 1999) and the climate change update to the Goals Project (2015) provide regional context for the important wetland ecosystem functions of the upper Petaluma River (Segment F). The Goals Project addresses many wetland ecological functions that are identified in Corps permit regulations as "important to the public interest" (33 CFR § 320.4(b)(2)) including wildlife habitat, water quality, nutrient transformation, carbon sequestration, and adaptation to climate change and sea level rise:
:

> (i) Wetlands which serve significant natural biological functions including food chain production, general habitat and nesting spawning rearing and resting sites for aquatic or land species…
> (iii) Wetlands the destruction or alteration of which would affect detrimentally natural drainage characteristics, sedimentation patterns, salinity distribution, flushing characteristics, current patters, or other environmental characteristics…
> (v) Wetlands which serve as valuable storage areas for storm and flood waters
> (vii) Wetlands which serve significant water purification functions…
>
> 33 CFR § 320.4(b)(2)

These wetland functions, their significance, and requirements for analysis are mirrored in 404(b)(1) regulations at 40 CFR § 230.20-230.41. The 404(b)(1) threshold for "significance" of wetland and aquatic impacts in this 404(b)(1) context (prohibition of fill discharge in jurisdictional waters) is not the high threshold of NEPA "significance", but a much lower threshold of "more than trivial, that is, significance in a conceptual rather than statistical sense" (Fed. Reg. Vol. 45, No. 249, Dec 24, 1980 p. 85343). They apply to both seasonal (non-tidal) and tidal wetlands of the Petaluma River. The Goals Project update (Baylands Goals 2015) highlights the importance of future connectivity between tidal wetlands and terrestrial (supratidal) lowland valleys and hills along the Petaluma River, not just in terms of current wildlife habitat, but in terms of future resilience of the whole Petaluma River wetland

ecosystem under stress of accelerated sea level rise after mid-century. The Goals Project update identified both hazards of sea level rise and opportunities to adapt to it along the Petaluma River corridor:

> Over time, with rising sea levels and potentially more extreme storms, flood protection along leveed edges will decline. In response to climate change, the options are either to improve flood protection along the existing levees or, as an adaptation strategy, selectively and opportunistically realign existing levees and concentrate flood protection along critical infrastructure…At such time, it would be beneficial to improve tidal connectivity to gradually sloping uplands, which would allow for the restoration of a potentially high-quality buffer habitat that with adequate space would be more resilient to sea-level rise. (Goals Project 2015, p. 153)

The Goals Project identified specific near-term and long-term opportunities to minimize conflicts between conservation of wetland functions and future sea level rise and climate change in the Petaluma River corridor, including diked baylands such as the project site. The key recommendation for this segment of the Estuary that apply to the proposed project site's wetlands, due to its landscape position, is:

> Protect, restore, and manage agricultural lands *and other open space* to *reestablish a transition zone and buffers adjacent to tidal marsh and to provide space for landward migration*… (Goals Project 2015, p. 153)

The proposed project site lies in diked baylands between the estuary and terrestrial slopes that would form essential transition zones at higher sea level. Although the SMART railroad line and road currently do constrain this potential future estuarine-terrestrial transition zone connectivity, these constraints may be overcome by retrofitted culverts, bridges, and raised roadways or rail lines. Industrial development of diked baylands filled and converted to uplands, however, represents a *significant irretrievable commitment of industrial/commercial land use* that permanently conflicts with the significant wetland ecosystem functions identified in the Goals Project. In its existing condition (derelict seasonal wetlands in diked baylands), the site has no substantial conservation or management conflict with adaptation of wetlands to future sea level rise. The proposed change in land use, however, would in itself cause significant conflicts with future wetland conservation and land uses (33 CFR § 320.4(a) that are not mitigated by the project's wetland mitigation and monitoring plan, which concerns only very short-term and local (within-site, temporary) wildlife and vegetation conditions.

A related major updated Goals Project (2015) regional recommendation indirectly applies to the proposed project. It concerns pollution due to contaminated runoff from adjacent uplands of the Petaluma River. The Goals Project addresses agriculture specifically because it has been the dominant land use, and the proposed industrial asphalt manufacturing plant represents a contaminant source that was not foreseeable to the preparers of the Goals Project update. ("Reduce the runoff of agricultural contaminants and nutrients from agricultural activities to improve water quality in the adjacent wetlands"). The basic concern

about contaminant discharges and water quality in important estuarine wetlands of the Petaluma River applies equally, if not more so, to the proposed asphalt plant, which has the potential to provide a major point source of emissions and runoff contaminants from the industrial operations (see discussion of wetland impacts below).

1.3 Project Site Description

The project site description in the 2015 revised wetland mitigation plan (Lynch et al. 2015) contains no account of the relationship between the wetlands on site (diked bayland seasonal wetlands) and the larger wetland setting of the Petaluma Marsh (Goals Project 2015) discussed in Section 2.0 above, and it contains no account of the relationship between the proposed project and the antecedent Corps-authorized wetland mitigation on the adjacent Landing Way property.

The PN states "A generally poor condition mitigation wetland is located on the Landing Way Property". Presumably, *all* wetland mitigation sites are subject to Corps permit conditions, and would require Corps approval for final acceptance under the Corps' standard wetland mitigation and monitoring plans. What is the basis for the Corps determination that the mitigation wetland is "generally poor condition"? If it is accurate, why would the Corps not require corrective measures to ensure compliance with previously authorized permit conditions? Is this "poor condition" mitigation assessment an independent determination of the Corps, based on the original wetland mitigation monitoring and management plan criteria, or a claim submitted by the applicant's consultant (arguing for low importance of project impacts to previous wetland mitigation?) and uncritically repeated in the PN? Either way, the statement in the PN is bizarre and bewildering.

2.0. Project Description

The project description in the PN appears to be incomplete with respect to work and structures regulated by the Corps under Section 10 of the Rivers and Harbors Act. The PN erroneously states that its jurisdiction over the project is under Clean Water Act Section 404, but does not refer to Section 10 RHA. But the project EIR analyzes impacts of the *proposed project's tidal water intakes (and thus intake structures) for dust control* during asphalt plant operations. The project proposed (in the EIR) to divert *10,000-20,000 gallons per day* (gpd) of *brackish estuarine water* from two sources: the Petaluma River, "and/or" a tidal "slough" (ditch) *in Area C* within the project site (DEIR V.C p. 23; V.G p. 14).

The DEIR identified these water intake project components specifically for ongoing dust control (required mitigation for air quality). It is extremely unlikely that this essential project mitigation component could be eliminated unless the equivalent water source (4-5 full water trucks per day) replaced the originally proposed local tidal water source. This inconsistency between the EIR project description and the Corps project description in the PN indicates the need for the Corps to verify whether the project within Corps jurisdiction is full and complete. The permit application must include a complete description of the proposed

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activity, including *all jurisdictional activities which are reasonably related to the same project* (for which a Corps permit would be required). 33 CFR §325.1(d)(1-2). The Corps should *reject as incomplete* any permit application that fails to disclose all reasonably related activities in Corps jurisdiction. 33 CFR 325.1(d)(2).

Therefore, if the project does still include water intake structures in ditches or Petaluma River intake locations that were omitted in the project description, the Corps must reissue/recirculate a corrected PN with complete project description within its jurisdiction.

The applicant has asserted that the proposed project would require impacting and "decommissioning" of previously approved mitigation wetlands: the May 2014 version of the Dutra Haystack Landing Wetland Mitigation and Monitoring plan states on p. 3: In addition, transferring aggregate materials from the barges via the electronic conveyor will require the decommissioning of an existing mitigation wetland that covers approximately 0.47 acre." The 2014 mitigation and monitoring plan further states (footnote, p. 3) that the *impacts to the antecedent Landing Way mitigation wetlands would require compensatory mitigation*: "Mitigation for impacts to the seasonal wetland to be decommissioned at the Landing Way facility for construction of the electric conveyor will require approval by the Corps of Engineers and the San Francisco Bay Regional Water Quality Control Board."

The 2015 revised mitigation plan also states on p. 27 (Lynch et al. 2015), without explanation of "decommissioning", that "one seasonal wetland covering a total of 0.47 acre occurs in the area to be decommissioned as a part of the project".

The PN does not provide any information about impacts of the proposed project to previously approved mitigation wetlands, and provides no description of a proposal to transfer old wetland mitigation compensation to new mitigation wetlands in the PN section on "Mitigation". The current project description plainly incomplete and inconsistent with the current (2015) mitigation plan. This omission of mitigation transfer (or potential net loss of past mitigation) is a potentially significant cumulative impact to seasonal wetlands of diked baylands in the northern Petaluma Marsh corridor. The omission is also a broader programmatic public interest concern for the integrity of Corps' enforcement of wetland mitigation conditions under its permit program.

The reliability of wetland mitigation for the proposed project after the proposed 5-year monitoring period may similarly be degraded by changes in adjacent land uses unless the applicant is required to maintain the mitigation wetland's integrity in perpetuity. The Corps should require mitigation for any project impacts to previously authorized wetland mitigation on or adjacent to the project site, and it should be included in the project's current mitigation plan.

The PN also misrepresents the types of wetlands present on the site. The project site description refers to "a tidally influenced swale bisecting it". In fact the ditches on site contain tidal channels and tidal marsh with damped tidal range and culvert-choked tidal

flows, subject to Rivers and Harbors Act (Section 10) jurisdiction. This is fully described in the project EIR as well as the 2015 (revised) mitigation plan (Lynch et al. 2015 p. 14). There is no meaningful distinction between a "tidally influenced" ditch (Lynch et al. 2015 p. 14) and a ditch subject to ebb and flow of the tide under Corps jurisdiction. The ditches are channels with intertidal mudflat banks and narrow fringing tidal brackish marsh. They are not "swales", which are merely shallow low-gradient depressions, and they are regularly flooded (diurnal tides), not intermittently flooded by extreme tides.

The Corps should recirculate a revised public notice that fully discloses and accurately describes:

- Any "decommissioning" of previously approved wetland mitigation and explain the regulatory authority (if any) for doing so, as well as the public interest basis for the proposal. I am unaware of any discretionary authority of the Corps to "decommission" previously approved mitigation primarily to expedite new Corps permits for private development.
- Any work or structures in Corps jurisdiction for diversion intakes of tidal water from tidal drainage ditches or the Petaluma River.
- Wetland types present on site, consistent with (a) its independently verified assessment of on-site wetland types (brackish tidal ditch wetlands as well as non-tidal or extreme high tide/backwater flooded and seasonally flooded depressional wetlands), and (b) applicant's consultant wetland assessment and mitigation plans. The Corps should carefully re-assess impacts of the proposed project to *tidal* wetlands as part of its factual determinations (40 CFR §230.41, 33 CFR § 320.4(a), 33 CFR § 320.4(b)(2).

3.0 Wetland, Wildlife and Water Quality, Impacts

The asphalt plant development proposal would have interrelated and significant direct, indirect, and cumulative impacts on wetlands on-site and off-site. These impacts would result from interactions among the project components and consequences of ongoing operation listed below.

- Runoff discharges of contaminants from the industrial asphalt plant area into preserved and restored on-site wetlands and tidal ditches (mitigation wetlands avoided or proposed to be "enhanced" as wildlife habitat), including petroleum hydrocarbons, heavy metals, and concentrated salts from daily saline water irrigation during the dry season;
- Drift (dispersal) of industrial runoff contaminants from the on-site wetland mitigation site and tidal ditches to the Petaluma River's estuarine waters
- Drift of atmospheric pollutant emissions from the asphalt plant to on-site and off-site wetlands, including wildlife feeding, roosting, and nesting areas for special-status fish and wildlife species as well as widespread wildlife species;

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- Drift of runoff and aerosol nutrient loads (biologically available nitrogen, phosphorus) to wetlands, causing or substantially contributing to eutrophication or hypereutrophication of wetlands or shallow pools;
- Noise impacts to wildlife from ongoing daytime industrial operations during essential wildlife behaviors (feeding, predator detection/vigilance behavior, prey detection and hunting behaviors).

These impacts, analyzed below, would be *essentially the result of issuing the Corps permit*, and are therefore fully within the scope of Corps environmental analysis. This is necessarily the case if the applicant's 404(b)(1) alternatives analysis is accepted by the Corps, because it claims that the project is not feasible without a Corps permit to fill wetlands as proposed, and that wetlands impacts have been minimized to the greatest extent feasible. Therefore, if there are no practicable, less environmentally damaging project sites with less wetland impact, and if the applicant has fully minimized on-site wetland fill impacts as required by 404(b)(1) sequencing (40 CFR §230.5), the project as a whole would essentially be the result of Corps permit issuance. Therefore, the Corps federal nexus controlling the scope of analysis must extend fully over the whole project's direct, indirect, and cumulative impacts. 33 CFR §325 Appendix B 7b). If, on the other hand, the 404(b)(1) alternatives analysis is not sound, then the Corps cannot issue a permit for a proposal which does not comply with 40 CFR §230.10(a) or 33 CFR §320.4(a)(2).

3.1. Water/sediment quality impacts of the asphalt plant operations on wetland habitat quality on-site (including mitigation wetlands) and off-site (Petaluma Marsh)

The project DEIR's hydrology and water quality chapter clearly identifies significant new sources of pollutants from emissions and runoff from the asphalt plant that would subject the adjacent mitigation wetlands to deposition of contaminants. Stormwater runoff transport would occur through the drainage ditch system within the wetland mitigation area after only filtration through sand. Contaminants would also be deposited in mitigation wetlands by direct fallout from plant emissions (particulates, aerosols). The DEIR explicitly identifies the ditch system running through the mitigation wetlands as a source of sediment and pollutant detention that would trap contaminants including petroleum hydrocarbons, heavy metals, pesticides and nutrients. Contaminants expected to occur in storm runoff from the project area include *petroleum products (diesel, asphaltic oil, No.2 fuel oil, gear Lube, motor oil, waste oil, used oil filters and grease*; CSW/Stuber-Stroeh draft Stormwater Pollution Prevention Plan 2014), and heavy metals (EIR V.G pp. 17-18).

There is *no mitigation or monitoring* proposed in either the DEIR (2008) or wetland mitigation plan (Lynch et al. 2015) *to minimize cumulative deposition of contaminants within the mitigation wetland (tidal and nontidal) ditch system and constructed seasonal wetland basins to less-than-significant levels* with respect to wetland wildlife receptors (ecotoxicity) or RWQCB dredge sediment screening criteria for cover sediments (the most applicable standards for constructed wetlands within baylands).

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No water quality treatment wetlands (surface treatment or subsurface treatment) have been proposed to biogeochemically process or attenuate contaminated runoff between the industrial site and mitigation wetlands. In fact, the *DEIR actually proposes that the ditches themselves – the wetland channels that run through the mitigation site -- would function to be receptors (sinks) for runoff contaminants*: "the ditch would serve as an extended detention basin during low and moderate runoff events". The wetland mitigation plan identified the hydrologic connectivity between the ditch system and mitigation wetlands (Monk & Associates 2014, p. 40; DD1, DD2 and DD6). This is a *basic unresolved wetland functional conflict between the DEIR and the wetland mitigation plan* resulting in significant contaminant impacts to wetlands: water quality treatment wetlands (contaminant sinks, biogeochemical processing of contaminants) superimposed on incompatible wildlife habitat wetlands as compensatory mitigation *within the same mitigation site and drainage ditch network*. The mitigation plan provides no reasonable explanation of how these conflicting objectives can be achieved together. This is a fundamental flaw in wetland mitigation design.

Contaminant attenuation of stormwater runoff entering the mitigation site would occur only through a simple catch basin and sand filter system, designed only for a 10-year flood event. The catch basin/sand filter would trap runoff particulates in stormwater, with water clarity as the only water quality criterion (EIR V.G p. 21: "A pretreatment catch basin and sand filter (or multiple basins and filters) that will capture and treat all runoff from all processing and storage areas for at least the 10-year design storm event…). The "below-ground catchment basins" and sand filters proposed are not proposed to remove dissolved contaminants, but only particulate (solid) contaminants. This deficiency in stormwater water quality treatment leaves the partially tidal to non-tidal ditch system within the mitigation wetlands to act as a supplemental stormwater treatment wetlands and detention system for trapping excess dissolved or colloidal suspended contaminants:

> The operation of the new and recycled aggregate storage and processing facilities and asphaltic concrete plant *would introduce new potential sources of water quality degradation at the project site. The project proposes the storage of hazardous materials, including heated asphalt, which could be accidentally released to the surface and subsurface.* Intensified land uses at the project site would result in *increased* vehicle use and potential discharge of associated pollutants. Increased numbers of vehicles and outdoor parking facilities at the project site would *likely result in increased leaks of fuel, lubricants, tire wear, and fallout from exhaust, which would contribute petroleum hydrocarbons, heavy metals, and sediment to the pollutant load in runoff being transported to receiving waters. Runoff from landscaped areas at the site may contain residual pesticides and nutrients.* ….runoff from the asphalt plant area of the site would be directed into a *below-ground catchment basin* designed to provide for *settlement of larger solids* entrained in runoff. Discharge from the basin would pass through a *sand filter* prior *to flowing to the vegetated drainage ditch DD6 at the western margin* of the site. *The* ***ditch would serve as an extended detention basin during low and moderate runoff events****. …settlement of suspended sediments (and associated contaminants such as hydrocarbons and metals) would occur within the ditch. Runoff from the*

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> *aggregate storage area would primarily drain westward to DD5, which would also be operated as an extended detention basin*… (DEIR V.G 17-19) (emphasis added)

The DEIR's analysis of asphalt plant (aerial) emissions on wetlands was limited to deposition and accumulation in tidal wetlands of the Petaluma River, which is a dispersive (tidal) environment. But neither the DEIR nor the wetland mitigation plan assessed the deposition of asphalt plant emissions into closed, undrained basins of non-tidal seasonal depressional wetlands in the mitigation site, where they may be trapped and accumulate. Contaminants cumulatively deposited in the drainage ditch system may be remobilized during storm events that flood the ditches, overtop their banks or internal levees, and flood into the constructed seasonal wetland basins. Additional pulses of contaminants may be directly deposited from runoff during extreme storm events, and from direct fallout deposition when wind directions align between the asphalt plant and adjacent on-site mitigation wetlands:

> Plant emissions could include particulate matter (PM) containing contaminants, including *polynuclear aromatic hydrocarbons and metals. Some of these emissions may settle directly into the River (atmospheric fallout) or be deposited on the land surface*…
> (DEIR V.G. p. 17-18; emphasis added)

The cumulative loading of contaminants and nutrients from storm runoff and aerial deposition discussed above does not even account for larger accidental spills that may occur during decades of asphalt plant operation.

The wetland mitigation plan does not account for storm flood events that would remobilized deposited contaminants in ditches, overflow ditches, and discharge contaminants into closed depressional wetland swales and pools in the mitigation site. The mitigation plan similarly fails to account for the fate of contaminants that enter the mitigation site (accumulation, evaporative concentration, biomagnification, biogeochemical transformation, microbial decomposition, volatilization, etc.). The wetland mitigation plan proposes no corrective measures or thresholds for action to address contaminant issues, even for the most predictable (petroleum hydrocarbon, heavy metal) contaminants.

3.2 Nutrient loading: phosphorus and nitrogen

Nitrogen and phosphorus are macronutrients that are either limiting or co-limiting for primary production in wetlands. High nutrient levels in wetlands are associated with dominance (low diversity) of relatively few, highly competitive and productive plant species, including non-native invasive species. Eutrophication of ponded, warm water by added phosphorus and/or nitrogen is also associated with harmful algal/cyanobacterial blooms, including ecotoxic *Microcystis* blooms. The DEIR analyzed impacts of phosphorus deposition from the asphalt plant on nutrient-impaired tidal wetlands of the Petaluma River, but it failed to assess impacts of phosphorus deposition into non-tidal, depressional (seasonal pool or marsh) mitigation wetlands adjacent to the source of phosphorus emissions:

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> Based on the air quality analysis conducted for this DEIR, the proposed asphalt plant would produce phosphorus emissions…. the RWQCB has determined that the assimilative capacity of the Petaluma River system has already been exceeded for nutrients…(DEIR V.G p. 19)

High temperature combustion sources, like that of the asphalt plant, produce reactive oxides of nitrogen, which can precipitate as biologically available forms of nitrogen, such as nitrite and nitrate. Neither the DEIR nor the mitigation plan assessed the potential cumulative effects of nitrogen deposition from the local and subregional sources: the asphalt plant, its landscaped areas, highway 101 and local roadsides, inflows from the Petaluma River during extreme high tides (including local nutrient loads from septic leachate, cumulative with wastewater treatment discharges upstream) and runoff from landscaped areas into the drainage ditch system that would occasionally flood the mitigation wetlands.

Given the multiple sources of potential co-limiting macronutrients from the asphalt plant, and the drainage connection between the asphalt plant runoff and the mitigation wetlands, there would be potentially significant nutrient loading of the mitigation wetland site once industrial operations begin. The mitigation wetlands would in effect be operating as supplemental nutrient polishing water quality treatment wetlands, whether by design or not. Eutrophication or hypereutrophication of the mitigation site wetlands would likely impair important wetland mitigation ecological functions, including native plant species diversity, carbon sequestration (high nutrients result in relatively higher decomposition rates of soil organic matter, higher turnover of soil carbon), and resistance to invasion by wetland weeds.

4.0 Wetland Mitigation Plan Feasibility

The feasibility of the proposed on-site wetland mitigation plan (Monk *et al.* 2014 and revised in Lynch et al. 2015) is significantly constrained by multiple fundamental problems that are not addressed, or remain basically deficient in 2015 revision of the wetland mitigation/monitoring plan. These problems arise principally from the following types of defects:

- Conflicts between the mitigation plan goals and proposed adjacent industrial environmental setting. The on-site location of mitigation wetlands are directly adjacent to the proposed asphalt plant sources of emissions and runoff. The mitigation wetlands as designed would be a sink for contaminants and nutrients from industrial and saline (dust suppression) runoff and airborne contaminant emissions from the asphalt plant, delivered to the mitigation wetlands through the tidal drainage ditch network. The seasonal wetland pools (seasonally inundated) are flooded by runoff and extreme high tides overflowing the tidal drainage ditches (Lynch et al. 2015 p. 20), and thus carry sediment-bound contaminants drained from the industrial runoff, dust, and other fallout. There is no mitigation for industrial site runoff or airborne emission contaminant pollution of the mitigation wetlands.

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Wildlife habitat wetlands on-site are inherently incompatible with the mitigation site's hydrological connectivity and exposure to industrial runoff and airborne contaminant emissions.

- Limitation of wetland mitigation functions to wildlife habitat values only, without regard to other compatible wetland functions important to the public interest (e.g., floodplain functions, water quality functions, ecological connectivity functions). The mitigation plan lists non-wildlife wetland functions at 3.3.3. (p. 19, Lynch et al. 2015; flood detention, groundwater recharge, sediment detention), but does not relate these to any wetland design components or analysis. Groundwater recharge, for example, is primarily a function of frequently flooded seasonal wetlands with relatively high sediment hydraulic conductivity (high permeability), whereas the proposed seasonal wetland pools are relatively impermeable clay soils that could not perform this function to a substantial degree without conflicting with duration of (designed) pool habitat. Ditch maintenance (as described in the EIR for the project) to maximize conveyance of flood flows would conflict with "flood detention". The non-wildlife wetland functions proposed are not supported by, or simply conflict with, the wetland design.

- Untenable or outdated, short-term hydrologic assumptions that neglect long-term effects of sea level rise as a driver of site-specific wetland hydrology driving long-term vegetation and habitat change. Cumulative impacts of sea level rise adversely affect mitigation wetland hydrology objectives and proposed wetland mitigation habitat objectives. Accelerated rise in sea level rates will predictably result in significant reduction in drainage, increase in backwater flooding during high tides and storm runoff events, elevated groundwater, and increased tidal wetland flooding. These changes would drive wetland ecological succession towards perennial saline or brackish marsh or seasonal submerged aquatic vegetation beds (*Ruppia maritima*), none of which are proposed as habitat objectives. High, near-surface fresh groundwater (linked to MHW elevation that will rise with sea level) is already indicated by limited and recent locations of willow and cattail around seasonal ponds on site (Lynch et al. 2015 p. 26).

- Unsound invasive species management that relies on removal methods only and neglects re-invasion of gaps (caused by removal) by weeds, and neglects dynamic vegetation processes that result successional replacement of weed-dominated vegetation by stable native perennial vegetation. This defect is compounded by the excessively short-term monitoring and management period (5 years) which is too short for stable, sustainable native vegetation to develop, or for weed populations to be sustainably controlled at this site and wetland type. The weed management fails to account for ditch maintenance and periodic colonization of ditch spoils by opportunistic disturbance-tracking wetland weeds (like *Lepidium latifolium*) weeds after the 5-year monitoring period. The mitigation plan also fails to address permanent weed seed rain sources from the disturbed industrial margins of the

project area, dispersing into mitigation wetlands and maintaining permanent high weed invasion pressure. The industrial site's disturbed margins would be weed populations vectors due to connectivity with roadsides, trucks from other disturbed sites, railroad track banks when routine vehicle traffic for the operating asphalt plant begins.

- Infeasible (illegal) use of many (the majority!) specific herbicides proposed for weed control of the mitigation site that are *not registered for use in or around wetlands or estuarine waters*, without explicit restriction for wetlands or their vicinity: for example, 2,4-D, aminopyralid, clopyralid, dicambda, chlorosulfuron, hexazinone, sulfometuron, including the surfactants in their formulations that may be equally or more toxic to aquatic life. This is a potential significant impact to wildlife as well as special-status or listed fish (chinook salmon, steelhead) that are present in tidal waters of the Petaluma River (Lynch et al. 2015 p. 31)

The proposed wetland mitigation plan is unlikely to offset the project's overall wetland impacts in either the short-term (within 5 year monitoring period) or long-term (>5 yr monitoring period), especially for wetland habitat functions.

4.1. Unresolved invasive species management conflicts with proposed ditch maintenance and disturbance

The DEIR proposed routine maintenance of the ditches that drain the asphalt plan and mitigation wetlands, involving excavation of sediment and vegetation; recurrent disturbance:

> *Wetland Maintenance*
> The project proposes the enhancement of existing wetlands (including drainage ditch DD4) in Area D of the site. Maintenance of existing drainage ditches DD1, DD2, DD3, DD5, and DD6 as vegetated drainage channels is also proposed….(DEIR V.G p. 16)

Permanent ditch maintenance is not a sustainable wetland restoration design. The routine excavation and side-cast spoil disturbances associated with ditch maintenance within the wetland mitigation site present multiple conflicts with wetland habitat quality for wildlife. First, recurrent disturbance of anoxic brackish tidally-influenced (relict or modern) fine sediment results in flushes of nutrient-rich sediment (anoxic sediment enriched with ammonia, reduced metals, and phosphates, oxidized when side-cast excavated spoils are drained) with reduced competition by dominant plants, and exposure of mineral sediment to light. Ditch spoils that are periodically disturbed become permanent seedling nurseries for many noxious brackish wetland weeds in the Petaluma River baylands, including perennial pepperweed (*Lepidium latifolium*) and Mediteranneann tarweed (*Dittrichia graveolens*), and Australiasian bentgrass (*Agrostis avenacea*) and rapidly spreading South American slim aster (*Symphyotrichum subulatum* var. *squamatum*). Weed propagule pressure (intensive local seed rain)

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from ditches would therefore provide strong local invasion pressure on mitigation wetlands long after the 5 year monitoring period ends. This impact would be cumulative with weed invasion pressure from the disturbed subsaline (dust suppression irrigation) periphery of the industrial project area.

In order to manage wetland weeds along maintained ditches, disturbances in ditches would need to be minimized in both extent and frequency (recurrence interval) to rare, small events. Active revegetation of exposed excavated mud, using native plants, would be necessary to pre-empt weed seedling habitat formed by ditch maintenance. Intensified weed management would need to follow each episode of ditch maintenance for several years, until native stands of closed-canopy marsh vegetation recover, and again provide strong competitive interference with wetland weed seedlings. None of these provisions are even considered in the wetland mitigation plan, let alone integrated in an implementation plan. The potential for compatibility between routine ditch maintenance for project site stormwater drainage, and long-term wetland habitat mitigation management, is low.

Ditch maintenance also has potential impacts on the biological availability of methylmercury and other heavy metals, which are likely conflicts with wetland wildlife management objectives for mitigation that are not addressed in the wetland mitigation/monitoring plan or DEIR. Anoxic, sulfidic ditch sediments excavated and placed on seasonally drained banks will oxidize, acidify, and liberate metals that were previously bound in stable forms like sulfides. Ditch maintenance is in effect a biogeochemical "pump" for metals that would otherwise be sequestered in vegetated sod-stabilized ditch beds and unavailable to wildlife. This potential significant impact is not mitigated in the DEIR or wetland mitigation plan.

4.2. Infeasible and inappropriate upland vegetation

The mitigation plan proposes to seed "chaparral" species in upland soils that do not naturally support chaparral. (Lynch et al. 2015 p. 57). There is no evidence that chaparral naturally occurred on or near the project site, where adjacent hillslopes are dominated by either grassland, oak savannah, or oak woodland/mixed evergreen forest. The failure of upland vegetation is likely to result in opportunistic invasion by weeds that would degrade the habitat value of the wetland mitigation site, and increase weed invasion pressure of its wetland-upland transition zones.

4.3. Inappropriate range extension of a federally listed endangered wetland plant.

The wetland mitigation plan (Lynch et al. 2015 p. 53) proposes to establish California sea-blite, *Suaeda californica*, in the tidal marsh vegetation of the mitigation wetlands. This is either an error of description in the local marsh vegetation, or a very ill-advised and misinformed *proposal that would require the Corps to conduct formal Section 7 Endangered Species Act consultation with the U.S. Fish and Wildlife Service. S. californica* is a federally listed endangered plant that has been reintroduced to its historical range in Central San Francisco Bay only recently. I personally performed these pilot reintroduction projects when I was endangered species staff biologist

at USFWS. *S. californica* is not native to San Pablo Bay, and does not occur there. The USFWS recovery plan for the species (which I drafted) notes that reports of this species residues in adobe bricks of Petaluma are erroneous, and the recovery plan does not support reintroduction to northern estuary locations beyond its historical range, or in brackish marshes.

4.4. Lack of design and objectives for establishment of stable native wetland vegetation

The "target vegetation" for the seasonal wetlands is still not actually defined at a species level or plant community level in the 2014 or 2015 versions of the wetland mitigation plan. There are no affirmative species composition targets or rejection criteria based on native plant communities in the wetland mitigation plan. In short, there are no measurable affirmative scientific criteria for native wetland vegetation composition, structure, or function in the mitigation plan. This is a basic and professionally unacceptable deficiency in the wetland mitigation design and monitoring plan. The wetland mitigation plant cannot be accepted as complete or feasible without explicit identification of appropriate native vegetation that may be stable in the soils and hydrology designed for the site, in competition with the vast accumulated and well-adapted seed banks of wetland weeds that are present on site.

The wetland mitigation design fails to provide even minimum baseline and design information for a feasible wetland vegetation establishment process, and four species mentioned casually in the above "target vegetation" are in fact non-native wetland weeds, which are not appropriate to include as objectives. The mitigation plan still mistakenly identifies a widespread non-native salt-tolerant annual weed *Atriplex prostrata* (syn. *A. triangularis*) as a native plant. The botanical nomenclature provided in the 2015 is generally outdated, and appears to omit all taxonomic revisions current in the Jepson Manual second edition (standard flora for California) or Flora of North America.

Nowhere in the mitigation plan is there any information on the species of *Juncus* or *Carex* (rush, sedge) that are "expected" to colonize the site, or whether adequate seed parent populations exist on the site or near it, or whether there is any evidence that they actively colonize disturbed, graded seasonal wetlands. In fact, there are only two native sedge species in the North Bay region capable of colonizing oligohaline (fresh-brackish) seasonal wetlands: *Carex praegracilis* (field sedge) and *C. barbarae* (basket sedge), and neither of them is known to occur anywhere near the project site on the northwest side of Petaluma Marsh; it is very unlikely that they are present on the site. Furthermore, both these sedges rarely establish new colonies from seed, grow very slowly by rhizome spread, and are at a severe initial disadvantage in competition with the superabundant non-native fast-growing wetland weeds already present at the site. They would require propagation and active transplanting of sods or plugs in order to establish at all, and the mitigation plan does not include specifications for their planting.

Similarly, the mitigation plan provides no information on the identity of rush species or whether or how they would establish. Only a few native rush (*Juncus*) species contribute to

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seasonally wet meadow vegetation in fresh-brackish North Bay seasonally saturated or flooded soils, namely *J. balticus* (syn, *J. arcticus*), *J. phaeocephalus, J. xiphioides*, and the annual *J. bufonius*. Of these, only *J. balticus* and *J. bufonius* are likely to be present in edges of tidal marshes near the site, and only *J. balticus* would be a viable candidate for co-dominance in target vegetation. Like the perennial sedges, *J. balticus* would require vegetative propagation and active transplanting with at least initial weed suppression to establish successfully. One of the most highly feasible, widespread, competitive, native species for alkali wet meadow vegetation is creeping wildrye (*Elymus triticoides*), which frequently co-occurs with saltgrass and alkali-heath. Populations of this species do in fact occur commonly in floodplains and baylands around Petaluma Marsh. But *E. triticoides* species is not even identified as a component of the target community.

With the exception of saltgrass and pickleweed in relatively saline depressions, the "enhanced" graded seasonal wetlands would likely be overwhelming dominated by wetland weeds rather than "target" vegetation, with the exception of non-native "naturalized" weeds that were inappropriately included as objectives of target vegetation.

In summary, the wetland mitigation plan's specifications for seasonal wetland "target vegetation" are woefully incomplete, factually and technically unsound, and infeasible. As proposed, the plan's implementation would likely result in a low-quality, weed-dominated seasonal wetland with poor prospects for rehabilitation at the end of the 5 year monitoring period.

4.5. Incomplete and infeasible wetland weed management design

Despite the addition of long and largely extraneous text (without citation; apparently cut/paste from other general sources) about species-specific weed removal techniques (primarily for upland weeds), the mitigation plan provides no feasible weed management strategy for the brief 5-year management and monitoring period. The inherent defect in the weed management actions proposed is that they would start with weed dominance after grading disturbances of weed-dominated soil seed banks, and would subsequently employ removal methods that would perpetuate the disturbances (vegetation gaps) that favor fast-growing, disturbance-adapted weeds over slower-growing, disturbance-intolerant native perennial vegetation. The mitigation plan is basically counter-productive with regard to its own vegetation targets: it would predictably result in weed removal disturbances promoting more weed reinvasion, and inhibition of slow-growing native perennial wetland vegetation. The plan cites no design basis (examples of Petaluma Baylands or North Bay) for seasonal wetland enhancement or restoration. I have decades of observation in North Bay seasonal wetland vegetation succession, and direct experience with landowner failure to implement or maintain feasible seasonal wetland vegetation. The chances of the proposed wetland mitigation objectives for vegetation being met at all, let alone in 5 years, are nil, in my professional opinion. The annual 5 year percentage vegetation targets are token, infeasible, paper exercises with no basis in practical experience or monitoring results of similar seasonal wetland enhancement/restoration projects in the region.

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The wetland mitigation plan cannot substitute generic compilation of weed removal techniques for a site-specific, plant community-specific weed management strategy based on succession, competition, and facilitation of native dominant vegetation. The weed management strategy must be fully integrated with the native dominant vegetation species composition and establishment processes. This is still entirely lacking in the mitigation plan.

4.6 Sea level rise and culvert constraints on mitigation wetland feasibility

The wetland mitigation plan fails to assess the long-term sustainability of the designed seasonal wetland hydrology, which is constrained by the dilapidated railroad culvert providing unreliable muted tidal drainage to the mitigation site, and which will be further impaired by accelerated sea level rise. The 2004 Preliminary Hydrologic Evaluation (Balance Hydrology) did not address sea level rise, and it was prepared before currently accepted sea level rise models were available. The DEIR clearly identified the general hydrological impacts of sea level rise for the asphalt plant project, but not for its mitigation wetlands:

> One effect of sea level rise will be that receiving waters *[sic]* surface elevations would be higher than under existing conditions, which would decrease available coastal floodplain storage volumes and conveyance capacity, potentially exacerbating backwater flooding effects. The result would be that lesser storms may result in what are currently classified as 100-year storm events, resulting in more frequent and severe flooding….for the duration of the life of the project (until about 2050). If sea levels rise dramatically faster than anticipated… [DEIR V.G p. 9]

The project DEIR correctly states that sea level rise during the project life (2050 or longer) may be expected to reach 14 inches or more, resulting in increased backwater flooding of the ditch system during high tides and storm runoff events. This would result in increased flooding of the mitigation wetlands, but sea level impacts interacting with the undersized culvert were not analyzed in either the DEIR or the wetland mitigation plan. Rising sea level would also cause shallow wet-season groundwater levels to rise in equilibrium with sea level, which would affect the hydrology of constructed mitigation seasonal wetland basins. The groundwater in the mitigation site was reported to occur as high as 3.7 ft below ground surface during the late spring (normal dry season; DEIR V.G p. 9), which indicates a likelihood of groundwater interaction (or emergence of groundwater) in excavated "seasonal" wetlands. Rising high groundwater would likely convert "seasonal" wetlands to perennial fresh-brackish (oligohaline) wetlands over time, especially in conjunction with increased backwater flooding due to sea level rise interactions with an undersized culvert.

Perennial fresh-brackish marsh would have different wetland ecological functions than those set by the current wetland mitigation plan goals and objectives. Thus, as proposed, the wetland mitigation hydrology is likely to be unsustainable and infeasible over the project life, but after the 5 year monitoring period.

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4.7 Wetland impacts of water diversion and salt accumulation from dust control activities

The project proposes to divert 10,000-20,000 gallons per day (gpd) of brackish estuarine water from two sources: the Petaluma River, "and/or" a tidal "slough" (ditch) in Area C (DEIR V.C p. 23; V.G p. 14). Neither the DEIR nor the wetland mitigation plan quantify the capacity of the muted tidal ditch system to supply even a fraction of this large daily summer demand for water. Instead, the DEIR provides a vague, programmatic and unenforceable mitigation condition (lacking any measurable thresholds) to address wetland impacts of water diversions:

> ***Mitigation Measure BIO-3a*** (5) Ensure that any proposed water diversion for dust control does not adversely affect the feasibility and success of tidal and brackish marsh to be created in Area D. This shall be demonstrated on an annual basis as part of on-going monitoring and maintenance defined in Sections 8 and 9 of the WMMP. Diversion shall be curtailed or an alternative method secured if performance standards and success criteria defined in the WMMP for areas of tidal and brackish marsh are not met due in part or wholly because of the proposed water diversion. (DEIR V.G p. 32)

The mitigation measure identifies no specific monitoring methods or measurable standards that could causally relate impacts of water diversion to shortfalls in ecological performance of mitigation wetlands. Lowering water levels of the ditches would steepen local groundwater gradients along ditch banks. Rapid pumping (40 gpm; DEIR V.C p. 23) would either entrain small aquatic organisms (invertebrates, small fish) smaller than intake screen pore sizes, or would become concentrated around screens. This would significantly interfere with wildlife feeding in the ditch system within mitigation wetlands.

The daily watering of the asphalt plant ground surfaces with brackish water would cause significant salt deposition from evaporation (DEIR V.G p. 15), although the salt load was not quantified for average salinity conditions in summer at the project location. Since even moderately brackish Petaluma River water in summer contains around 25 ppt (2.5% salt; McMillan 2011 p. 8), salt deposition rates on the site during summer would be highly significant. The DEIR, however, analyzed only impacts of "first flush" fall rain saline runoff on discharges reaching fully tidal estuarine marsh (DEIR V.G p. 15), and omitted analysis of saline to hypersaline runoff into the mitigation site ditch system. The wetland mitigation plan does not even identify (let alone mitigate) effects of saline stormwater discharges from fall rains as a wetland management issue.

Hypersaline discharges could cause dieback of non-dormant cordgrass or alkali-bulrush in muted tidal ditches during fall months. If ditches flooded with saline to hypersaline "first flush" runoff spilled over to depressional non-tidal wetlands during major fall storm runoff events, seasonal mitigation wetlands would be salinized, and would probably be reduced to low species diversity of the most salt-tolerant salt marsh plant species (native saltgrass,

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pickleweed, and non-native spearscale). Because seasonal wetland depressions are undrained (lack outlets for surface flows or salts), the salinization impacts may be persistent and impractical to correct.

4.8 Adverse sediment quality risks: acid sulfate soil formation

Brackish wetland soils that alternate between strong anoxic reducing conditions (flooding, waterlogging) and aerobic drainage conditions (drainage or drying) are prone to develop acid sulfate soils that may cause significant adverse soil conditions, including extreme low pH, excessive availability of free metals, and physiological stress or mortality of plants and wildlife that are intolerant of these conditions. Thus, acid sulfate soils can be a significant constraint on seasonal wetland enhancement or creation in brackish seasonal wetland soils in Petaluma River baylands. The existing seasonal wetland vegetation described in the wetland mitigation plan is consistent with brackish soil conditions derived from exposure to estuarine salinity, although detailed soil salt content analysis of the site is lacking. Multiple sources of estuarine salinity in sediments include:

> (a) brackish tidal process water in quarry fine sediment (past gravel washing and deposition of quarry fines in settling ponds; Monk et al. 2014, p. 23), deposited in thickness variously described as 3 ft-11 ft (DEIR Hazardous materials V.F p. 2) or 6.5-11 ft thick;
>
> (b) exposure of excavated Reyes clay (Bay mud) from the underlying original diked tidal marsh soils
>
> (c) modern ditch overtopping during high tide back-flooding of ditches during storm runoff peaks (mixing of estuarine water and runoff).

Sulfate is a major anion of seawater, and in anoxic sediments with high organic matter content (residual wetland vegetation below-ground biomass and buried litter), sulfur-reducing bacteria reduce sulfate to sulfides, in the form of reactive hydrogen sulfide gas and relatively stable iron sulfide. Upon drainage, however, iron sulfide deposits in diked bayland soils oxidize and form abundant iron oxide and acid sulfates, often visible as barren rust-colored "red pans" in beds of seasonal pools or ponds. Toxic levels of acid sulfate and free iron (and other metals) can maintain acid sulfate/iron oxide barrens. Local recent examples are known from the Petaluma River baylands. The excavation of natural bay mud at the Petaluma Marsh Expansion tidal restoration project (San Antonio Creek) for construction of a seasonal wetland supratidal bench resulted in extreme acid soils (pH 2, the lowest ever measured by the local soil testing company) that maintained unvegetated barrens for years. Similar barrens resulted in portions of the Bahia wetland restoration project supratidal seasonal wetlands (lower Petaluma River) after "red pan" sediments were graded.

The soil organic matter monitored in the project's mitigation wetlands (Monk *et al.* 2014 p. 58; DEIR V.C p. 31), plus the alternation between winter-anoxic flooded soils and summer-

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dry soils of seasonal wetlands, indicates a potentially significant risk of acid sulfate soil formation in the project site's soils, regardless of whether grading exposes quarry fines or Reyes clay as beds of seasonal wetlands. In addition, annual primary productivity (above and below-ground vegetation biomass) would continue to fuel sulfur-reducing bacteria with organic matter, even in the absence of soil organic matter amendments.

Acid sulfate soils may cause persistent deficiencies in revegetation of wetlands by native vegetation, and inhibit plant growth and native species diversity. Some of the most acid-sulfate tolerant and salt-tolerant species are non-native annuals such as spearscale (*Atriplex prostrata*), weedy species of spurrey (*Spergularia* spp.). Mediterranean tarweed (*Dittrichia graveolens*) and Australasian bentgrass (*Agrostis avenacea*), all of which are also major rapid invasive weeds of San Pablo Bay seasonal wetlands in diked baylands (see invasive species, below). Development of acid sulfate soils may make wetland weed control practically infeasible if the primary tolerant species are non-native weeds. In addition, low pH may increase solubility (biological availability) of heavy metals in soils derived from Tolay volcanic and Franciscan metamorphic quarry rock (quarry fines), and stormwater discharges from the asphalt plant.

The cumulative effect of acid sulfate and heavy metal contaminants is difficult to treat with agricultural soil amendments such as lime (calcium carbonate), because undrained fine-grained wetland clay-silt soils do not infiltrate surface applications of lime. Discing wetland soils to force lime penetration would disturb wetland soils and vegetation, and promote weed dominance. Normal seasonal fluctuations between waterlogging and drying of seasonal wetland soils would likely regenerate acid sulfates over time, requiring re-treatment. Only tidal restoration or perennial flooding of wetlands provides permanent correction of acid sulfate soils.

4.9 Summary and conclusions: wetland mitigation adequacy

The conflicts between the water quality treatment functions of the ditch wetlands that extend through the mitigation site, and wetland habitat compensatory mitigation functions, are significant and unresolved.

The chronic loading of petroleum hydrocarbons, salts, and other contaminants into the ditch system and shallow groundwater connected to the wetland mitigation site is a substantial burden to manage while maintaining high quality wetland wildlife habitat, and it appears doubtful that reconciling the conflict would be feasible. Since the only drainage outlet to the Petaluma River is the railroad culvert, which would have to be shared between stormwater discharges and mitigation wetland outflows, reconciling conflicting water quality and habitat objectives is probably infeasible. The on-site wetlands could be designed to function for stormwater treatment efficiency, minimizing exposure of wildlife to attractive nuisances of contaminant-impaired shallow open water with vegetated edges. An efficient perennial surface treatment/subsurface treatment wetland with high shallow groundwater (perennial near-surface soil saturation) would be needed to mitigate potentially significant cumulative

and chronic stormwater contaminant impacts of the asphalt plant. This would be incompatible with compensatory habitat mitigation for wetlands on-site.

In addition, the mitigation plan fails to consider the increased salt deposition (spray drift, salt films, salt dust, saline fall runoff) in the mitigation site and its buffer areas due to summer dust control measures using brackish tidal water irrigation at the asphalt plant.

The wetland restoration/enhancement design is poised to develop overwhelming dominance by non-native invasive wetland vegetation, and fails to provide even minimal design information to facilitate establishment of feasible native wetland vegetation. The target vegetation inappropriately includes wetland weeds, and success criteria do not set any limits for the proportion of the vegetation that is non-native invasive species.

The failure of the mitigation plan to identify impacts of obvious (explicit in DEIR) contaminant discharges to mitigation wetlands, despite over 10 years of planning and review, raises further questions about the technical adequacy of mitigation planning and scrutiny. The Corps should reject the wetland mitigation plan as inadequate. I recommend that any compensatory mitigation plan for seasonal wetlands in diked North Bay baylands be prepared by a qualified wetland consultant with substantial professional experience and at least minimal demonstrated ability to prepare and implement such a plan.

5.0 Off-site wetland Impacts

Many of the same failures to apply the DEIR's hydrological analyses to the wetland mitigation site also apply to the environmental assessment of wetland impacts off-site. This has resulted in numerous underestimates of potentially significant impacts to wetlands off-site, particularly non-tidal wetlands that lack regular tidal flushing, and which may accumulate contaminants or nutrients in relatively closed basins.

For example, the DEIR's assessment of asphalt plant emission fallout (including both aromatic hydrocarbons, heavy metals (DEIR V.G 18-19), and macronutrients like phosphorus; DEIR V.G 19, 23)) may have potentially significant indirect and cumulative impacts on the non-tidal seasonal wetlands of Shollenberger Park. The cumulative impact of these pollutants would require an analysis of the background levels of contaminants and nutrients (cumulative burden) at Shollenberger Park sediments, and an estimate of net deposition of contaminants/nutrients originating at the asphalt plant. This analysis, to the best of my knowledge, has not been performed.

6.0 Special-status species impacts.

Impacts to special-status wetland species have relied on outdated biological assessments and very limited survey data prepared in a "Biological Constraints Report" for the project prepared in 2003, and recycled with minimal supplemental information in the 2008 DEIR. Subsequent special-status species analyses have simply repeated stale information from

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reports that are now more than a decade old and unreliable. After a decade of significant climate fluctuations (drought, high rainfall years), new invasive species invasion threats in the Petaluma River wetlands (*Dittrichia gravelolens, Agrostis avenacea, Symphyotrichum subulatum* subsp. *squamatum*) and associated changes in habitat conditions, the special-status species conditions have almost certainly changed. Special-status species assessments for the project must be supported by evidence from current surveys, just as previous wetland jurisdictional delineations have expired and must be updated.

The mitigation plan's reliance on a 2005 (over 10 yr old) "no take" letter from U.S. Fish and Wildlife Service Sacramento Fish and Wildlife Office to address potential impacts to federally listed salt marsh harvest mouse is unsound. Site conditions and populations of small mammals are likely to change along with vegetation/habitat conditions over a decade. The Service's letter was dated January 13, 2015, and therefore did not account for the changes in the site's wetland vegetation due to the high rainfall and flooding of late 2005-2006, and the unauthorized grading (fill) of the site's wetlands in summer 2005. The Sacramento Fish and Wildlife Office no longer has jurisdiction over the endangered species of San Francisco Bay and Delta; that authority now lies with the Bay-Delta office. It is unlikely that the USFWS would now allow trapping of the salt marsh harvest mouse to supply negative survey data interpreted to demonstrate absence, since this species undergoes movements in response to flooding events, population fluctuations, competition, and changes in habitat distribution and quality.

The project's impacts on wetlands, including discharges of stormwater runoff contaminants to tidal ditches connected to pickleweed marsh, contamination by herbicides proposed in the mitigation plan, may adversely impact salt marsh harvest mouse populations both on-site and off-site in brackish marshes nearby. The Corps should initiate consultation with the Service to assess impacts of the current project in current conditions affecting the salt marsh harvest mouse.

Similarly, the distribution of Ridgeway's (formerly California clapper) rails and California black rails along the Petaluma River would require new surveys after a decade of no data. For federally listed species, the "Biological Constraints Report" would need to be revised as a Biological Assessment compliant with Endangered Species Act regulations at 50 CFR §402.08 and §402.12 .

The mitigation plan also failed to consider potential impacts to two rare (state and federal species of concern) plants that may occur in tidal fresh-brackish wetland edges of San Pablo Bay: Mason's lilaeopsis, *Lilaeopsis masonii,* and salt marsh owl's-clover, *Castilleja ambigua.*

The mitigation plan's assessment of western pond turtle (*Actinemys marmorata marmorata;* Lynch et al. 2015, p. 32) is unsound. It underestimates the likelihood of occurrence of this species on basking sites like bare eroded marsh banks and slump-blocks and large woody debris along the Petaluma River, particularly in years of high rainfall and freshwater discharges. Western pond turtles are quite common in some slough banks of Suisun Marsh

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where salinity range and vegetation is similar to those of the upper Petaluma River (tule and bulrush reaches). The claimed "heavy flow" of the river in winter is an invalid reason for discounting the suitability of this habitat, since turtles can escape to emergent wetland or terrestrial habitats during floods. No surveys have been conducted for this species at the project site. Potential significant project impacts to western pond turtles include river intake pump mortality of juveniles, creation of attractive nuisance habitat at eroded banks near intakes, and discharges petroleum hydrocarbons and other contaminants.

The mitigation plan fails to assess potential entrainment impacts due to water intake for dust suppression (40 gpm pumping rate, over 20,000 gpd) on special-status fish species, such as outmigrating juveniles of (federally listed salmonid) chinook salmon and steelhead, both of which are reported as present in Petaluma River tidal waters (Lynch et al. 2015 p. 30-31). Listed salmonids may also be adversely affected by discharges of stormwater runoff contaminants from the asphalt plant. Other special-status or listed species, such as Delta smelt and Sacramento splittail, could be adversely impacted by intakes of tidal waters for dust suppression. These are potentially significant project impacts that are not assessed, and are not mitigated. For federally listed fish species, the applicant should prepare a Biological Assessment compliant with Endangered Species Act regulations at 50 CFR §402.08 and §402.12, submitted to USFWS and National Marine Fisheries Service for fish species in their jurisdiction. The Corps should initiate consultation with the Services if no Biological Opinion is submitted.

7.0 Wetland mitigation policy issues

The wetland mitigation plan proposes to "decommission" existing compensatory mitigation wetlands that were required by another permit. The proposal cites no regulatory authority or permit agency rationale to do this, and assumes that modification of another wetland permit (USACE/RWQCB) can be done as a matter of discretion. The wetland mitigation plan does not cite any official documentation from the landowner or permittee holding the past mitigation obligations to transfer liability for failed mitigation to the current applicant. The proposal to "decommission" a presumably established and compliant wetland mitigation site and compensate for it with a speculative new mitigation site is problematic for wetland regulation. First, the exchange causes a net temporal loss of wetland function that is apparently not compensated by a significant increase in wetland function from the new restored/enhanced wetlands. Second, the location-specific wetland functions, like water quality improvement of local runoff, cannot be replicated off-site if drainage patterns are unrelated. Third, the elimination and transfer of wetland mitigation obligations as a matter of private expedience for new wetland fill projects raises serious questions about the security and enforceability of wetland mitigation conditions. The public interest analysis, to balance private and public interests, for decommissioning and transferring mitigation obligations has not been documented.

The mitigation proposal has an additional burden of providing "after the fact" permit mitigation compensating for unauthorized grading and filling of wetlands in 2005, the

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impacts of which have lacked any corrective enforcement measures for nearly a decade. Permit agencies would need justification for rewarding unauthorized wetland fill with suspension of enforcement actions (and costs) for a decade in addition to the expedience of "decommissioning" independently permit-required wetland mitigation. Neither of these proposed discretionary actions is authorized by the USACE permit regulations governing mitigation or enforcement procedures.

Finally, the proposed wetland mitigation "package" relies heavily on claims of "enhancement" and "preservation" of existing jurisdictional wetland acreage and upland buffers to supplement a relatively low ratio of compensatory (new/restored wetland 2.66 acres) to filled/converted upland wetland acreage (1.37 acres; less than 2:1). As analyzed above, the feasibility of the proposed wetland mitigation plan is low, and it is likely to achieve at best degraded seasonal wetland conditions by and after the 5 year monitoring period.

8.0 Alternatives analysis – 404(b)(1) EPA CWA Guidelines and NEPA

The alternatives analysis does not comply with the requirements for Section 404(b)(1) Guidelines (40 CFR 230.10) or NEPA. The 401 certification application substitutes the threshold of "suitable" (subjective perspective of the applicant) for the more stringent "practicable" threshold under 404(b)(1) alternatives test. Similarly, it substitutes a general-meaning use of "practicable" for the more stringent and specific test of "least environmentally damaging practicable alternative" in comparing alternative sites.

The alternatives test under 404(b)(1) is based on the presumption that a project proposing fill in jurisdictional 404 wetlands or other special aquatic sites has the burden of showing that no other "practicable" alternatives are available, unless the basic (not overall) project purpose is water-dependent (requiring siting in or adjacent to water). The basic (not overall) project purpose of the asphalt plant is industrial production of asphalt. This is not a water-dependent basic purpose. The project's overall purpose may include logistical and feasibility aspects such as efficient transport, market/service area, supply of raw materials, land use, etc., but the "water dependency" test is based on basic, not overall purpose. Therefore, under 404(b)(1) alternatives analysis, it must be presumed that a less environmentally damaging alternative to wetland fill exists unless demonstrated otherwise – meaning that the applicant has the burden of demonstrating that no "less environmentally damaging practicable alternative" exists. This is not a general-sense meaning of "practicable"; the term is defined in 404(b)(1) and is supported by case law.

The alternatives analysis fails to define basic "practicability" criteria in an objective way. First, it fails to provide an objective basis for market area or service area to set reasonable bounds to the geographic scope of potentially practicable off-site alternatives. Second, it fails to show the distribution of existing serviceable asphalt plants in the region (including those owned by the applicant), or their sizes (or a minimum size feasible footprint for an asphalt

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plant). Third, it fails to display the distribution of potentially feasible or available industrial sites that could be used for an asphalt plant.

The analysis also fails to justify some (potentially arbitrary and unreasonably narrow) feasibility criteria such as proximity to railroad tracks. Unless all asphalt plants in the region, including the one that the project proposes to replace, were "proximate" to railroad tracks, this criterion for alternatives sites is not reasonable, and is merely a preference of the applicant. In general, the alternatives analysis does not distinguish applicant's preferences from feasibility criteria applicable to any project of the same type. A comparison of trucking and rail transport in terms of environmental impacts and economic viability may be relevant, but there is no justification presented for the assertion that railroad proximity is necessary for a feasible asphalt plant location.

The project's overall purpose is relevant to determinations of "practicability" only. Similarly, pursuant to NEPA regulations and guidance, "reasonable" alternatives – not necessarily those alternatives preferred by an applicant – must be evaluated if they would significantly reduce impacts or increase environmental benefits, even if they are not within the jurisdiction of the permit agency or immediately available to the applicant.

9.0 "Significant degradation" prohibition of 404(b)(1) Guidelines

The project's significant potential wetland impacts and inadequate mitigation fail the "significant degradation test of the 404(b)(1) Guidelines. (40 CFR § 230.10(c): "No discharge of fill shall be permitted which will cause or contribute to significant degradation of jurisdictional U.S. waters, including wetlands". Effects contributing to impermissible "significant degradation" of U.S. waters include direct, indirect, and cumulative impacts such as: pollutant transfer, concentration, or spread outside of the disposal site that adversely affects aquatic life, other water-dependent wildlife (40 CFR §230.10(c)(2); impairment of aquatic ecosystem diversity, productivity, and stability (loss of capacity of wetland to assimilate nutrients, purify water…). The potential impacts of the project to wetlands due to contaminants, invasive species, special-status species, and likely failure of wetland mitigation justify findings of noncompliance for "significant degradation" of wetlands (40 CFR §230.12(a)(3)(ii).

Documents reviewed and cited

Permit applications and supporting documents

- RWQCB Section 401 water quality certification application 12/15/14 and comments
- Monk & Associates *et al.* 2014. Dutra Haystack Landing Wetland Mitigation/Monitoring Plan, April 2006 and revised version Nov 2014 (including appendices)
- Draft Environmental Impact Report 2008 (DEIR) (based on old project description and baseline 2003-2005)

- Lynch et al. 2015. Dutra Haystack Landing Wetland Mitigation/Monitoring Plan
- USACE Public Notice Dutra Haystack Asphalt Plant Project 2003-281040, Sept 15, 2015
- USFWS 2014. Recovery Plan for Tidal Marshes of Northern and Central California.
- Goals Project. 2015. *The Baylands and Climate Change: What We Can Do. Baylands Ecosystem Habitat Goals Science Update 2015* prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. California. State Coastal Conservancy, Oakland, CA .

STATEMENT OF QUALIFICATIONS

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Ph.D, Plant Sciences– University of Western Ontario, London, Canada, 1991.

Thomas J. Watson Fellow, Providence Rhode Island, 1981 – (coastal dune, beach, marsh vegetation dynamics UK and Maritime Provinces, Canada)

B.A., Colby College, Waterville, Maine – distinction in majors of Biology, Philosophy – 1981

My areas of specialization in applied ecology are management, restoration, planning of coastal wetland and terrestrial vegetation, particularly in relation to geomorphic processes and conservation of special-status plant species. I have worked and studied in applied ecology of coastal habitats since 1979, in New England, Canadian Maritime Provinces, Great Lakes, Britain, and California.

Since 2002, I have worked as independent coastal ecological consultant in Central and Northern California. My clients are primarily nonprofit organizations, land trusts, and state or federal resource agencies with conservation mandates. Much of my restoration planning and design work has been applied to tidal wetland restoration projects in the San Francisco Bay Estuary, ranging from Suisun Marsh and the Delta (Rush Ranch wetland management and enhancement plans, with Wetlands and Water Resources (WWR); Dutch Slough conceptual restoration planning, Natural Heritage Institute/Coastal Conservancy), to San Pablo Bay (Sears Point wetland restoration; WWR; Bahia Wetlands Restoration Project and Petaluma Marsh Expansion Project; (Marin Audubon Society/Philip Williams and Associates); Sears Point Wetland Restoration Project (Sonoma Land Trust/WWR), and San Francisco Bay (Aramburu Island beach and seasonal wetland enhancement, WWR; Oro Loma Horizontal Levee/Ecotone Project [dual treatment wetland/climate change adaptation], ESA).

On the outer coast, my projects include vegetation components of riparian, stream, and lagoon restoration and management plans (Muir Beach/Redwood Creek, National Park Service; Laguna Creek Lagoon and Pilarcitos Creek Mouth enhancement project, WWR), and consultation on dune and dune wetland restoration/management (MacKerricher Dunes State Ecological Preserve, California State Parks; Bodega Dune Restoration, UC Bodega Reserve/State Parks; Rodeo Lagoon, National Park Service; scientific review panel for Lawsons Landing dune management, California Coastal Commission). My inland wetland management consultations includes vegetation management plans for Cunningham Marsh, Sebastopol, Sonoma County (California Native Plant Society), and Laguna de Santa Rosa invasive plant management (Laguna Foundation/J. Meisler).

I have extensive regional wetland planning experience in the Bay Area from two related and simultaneous projects during my work at U.S. Fish and Wildlife Service (Sacramento Fish

and Wildlife Office, Endangered Species Program, Bay Area suboffice) from 1997 to 2002: the San Francisco Bay Area Wetland Habitat Goals Project, and the Tidal Marsh Ecosystem Recovery Plan for central and northern California. As a contributing co-author and participant in the Goals Project (Plant Team and alternate on the Resource Managers Group), I helped develop scientific and resource policy recommendations for plant communities, and prepared two chapters on tidal marsh plants and diked bayland vegetation (Species and Communities Profiles). In addition, I was a contributing author and scientific advisor for the 2015 Baylands Goals update. I completed the comprehensive administrative draft ecosystem recovery plan for endangered species of central and northern California tidal marshes, including detailed technical appendices and GIS-based maps for restoration of diked baylands and management of existing tidal marshes. At a local level, I also prepared or contributed to numerous biological opinions (Section 7 Endangered Species Act consultations) for projects in the Estuary.

My work for the U.S. Army Corps of Engineers, San Francisco District, Regulatory Branch (1991-1997) specialized as senior staff for NEPA compliance (including EIS management), wetland impact analysis, jurisdictional analysis, endangered species consultation, and technical review of complex wetland mitigation plans and large-scale tidal wetland restoration projects, such as Montezuma Wetlands (Suisun Marsh) and Sonoma Baylands (San Pablo Bay).

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EDUCATION

Ph.D. 1990, Department of Plant Sciences, University of Western Ontario, Canada
Ph.D. thesis: Comparison of European and American beachgrass (*Ammophila* spp.) growth responses to sand accretion and salinity.

B.A. 1981, Colby College, Waterville, Maine. Distinctions in majors of Philosophy, Biology. Awarded Stephen Coburn Pepper prize in Philosophy.

Thomas J. Watson Fellow, 1982. Thomas J. Watson Foundation, Providence, Rhode Island. Fellowship research: Comparisons of vegetation and geomorphology, barrier beach ecosystems of Britain and Maritime Provinces, Canada.

PROFESSIONAL EXPERIENCE

Coastal Wetland and Lagoon Restoration, Management and Planning

Oro Loma Ecotone Project, Hayward, Alameda County, CA. Subconsultant to ESA-PWA for ecological (vegetation, soil, hydrology) design of innovative estuarine-terrestrial wetland ecotone and water quality treatment wetland complex. 2012-present.

Bolinas Lagoon Kent Island Restoration Project. Subconsultant to William Carmen & Associates, for Marin County Parks and Open Space District. Vegetation management for supratidal flood tidal delta island flats and estuarine ecotone. 2011-present

Mountain Lake (San Francisco Presidio) Enhancement Project. Marsh and submerged aquatic plant community reintroduction and vegetation management planning of dune lake in Presidio of San Francisco. Sub-consultant for interdisciplinary project team coordinated by Presidio Trust. 2011-present.

Pilarcitos Creek Lagoon Enhancement Project, San Mateo County; with Wetlands and Water Resources, San Rafael; Don Alley (fish biology), and Balance Hydrologics, Berkeley. San Mateo County;. Client: San Mateo County Resource Conservation District. May 2010

Rush Ranch Master Plan, Land Stewardship Program, and Restoration Designs. Subconsulting lead ecologist to Wetlands and Water Resources and ESA-PWA, for Solano Land Trust, Rush Ranch National Estuarine Research Reserve, Suisun Marsh, Solano County, California.. Historical and modern ecological baseline synthesis and assessment, climate change adaptation, endangered species conservation, site-specific restoration planning, and integration with public access. 2010-2012t

Petaluma Marsh Expansion Project, San Pablo Bay, Novato, Marin County. Design, assessment, and specifications of vegetation restoration, management, and monitoring of a 100+ acre tidal marsh restoration Project on the Petaluma River. Technical support for biological assessments, coordination of physical engineering design in collaboration with Philip Williams and Associates, Ltd., San Francisco. (September 2002 – 2006) Client: Marin Audubon Society

Bahia Wetlands Restoration Project, San Pablo Bay, Novato, Marin County. Design, assessment, and specifications for vegetation restoration, management, and vegetation monitoring plan of a 300+ acre tidal marsh and seasonal wetland restoration project on the Petaluma River, Novato, Marin County, California. Collaboration with Philip Williams and Associates, Ltd., San Francisco. (September 2003 – 2008). Client: Marin Audubon Society

Simmons Slough Wildlife Corridor – Vegetation Management Plan San Pablo Bay, Novato, Marin County. Draft, December 2008. 40 pp. plus appendices. Coordinated with engineering plan (2003) by Wetlands and Water Resources. Client: Marin Audubon Society

Laguna Creek Lagoon Enhancement Plan, Santa Cruz County. Lead ecologist, co-author with Christina Toms and Stuart Siegel, Wetlands and Water Resources. 2008 (see Wetlands and Water Resources) Client: California State Parks.

Hunter's Point stormwater wetland planning and design, San Francisco. Subconsulting services for conceptual design of backbarrier tidal lagoon and fringing wetlands, in collaboration with FarWest Engineering. Initiated July 2009-2011. Client: ArcEcology, San Francisco.

Pier 94 Port of San Francisco salt marsh enhancement, San Francisco. California sea-blite reintroduction plan and on-site technical assistance. Bay beach nourishment and endangered species reintroduction, monitoring plan, in cooperation with Port of San Francisco and FarWest Engineering. 2006 – 2008. Client: Golden Gate Audubon Society

Strawberry Elementary School seasonal and tidal wetland revegetation, Richardson Bay, Central San Francisco Bay, Marin County. Technical assistance with revegetation, native plant propagation, and wetland weed management of tidal marsh expansion. Collaboration with FarWest Engineering and Brian Powell and Associates, Landscape Architecture. 2007-2008. Client: Mill Valley School District/Strawberry School PTA.

Big Lagoon (Muir Beach/Redwood Creek) Vegetation Management Strategy, Marin County. Report and appendices for revegetation, propagation, soil management, non-native species management, and conceptual design for backbarrier lagoon wetlands. November 2008. Client: National Park Service, Golden Gate National Recreation Area and National Parks Conservancy.

Marin Baylands Conceptual Model. Philip Williams and Associates. Co-author of long-term coastal management plan integrating geomorphic dynamics, plant ecology, and wildlife for Marin County Planning Department, guiding conservation of Marin County's shoreline along San Francisco and San Pablo Bays. Client: Marin County Planning Dept. 2010.

Endangered plant reintroduction plan: California sea-blite (*Suaeda californica*), San Francisco Bay. Habitat management and reintroduction plan for regionally extinct native salt marsh plant. Client: U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office. July 2005-2008.

North Parcel and Leonard Ranch Vegetation Management Plan. With Wetlands and Water Resources. Consultant for vegetation planning, planting specifications, and practical management of seasonal wetlands in nontidal reclaimed tidelands, San Pablo Bay, acquired for waterfowl and shorebird habitat. Client: Sonoma Land Trust, Santa Rosa. 2004.

Sears Point Tidal Restoration Project. With Wetlands and Water Resources, San Rafael. Lead ecologist for conceptual and preliminary restoration design, feasibility and impact assessment; restoration and enhancement of tidal wetlands, nontidal freshwater streams and marshes, and native grasslands, >2300 acre site. Sonoma Land Trust. 2005-2007.

Coastal dunes, bluffs, and beaches

Tenmile Dunes Haul Road Removal and Restoration, MacKerricher State Park, Mendocino County, California. Consultant to California State Parks for road removal and native dune restoration in coastal dune ecological preserve. 2013.

Ocean Beach Management Plan, San Francisco. Urban foredune rehabilitation and adaptive management for long-term sea level rise and shoreline retreat. Subconsultant to ESA-PWA, San Francisco, for SPUR (San Francisco Urban Planning and Research Association). 2013-ongoing.

Coastal Regional Sediment Management Plan, San Francisco Littoral Cell. Ecological subconsultant to ESA-PWA for U.S. Army Corps of Engineers planning study of long-term sediment management alternatives of Ocean Beach to Pacifica, California. 2011-2014.

Aramburu Island Enhancement Project, Richardson Bay, Central San Francisco Bay, Marin County. Subconsulting lead ecologist in collaboration with Wetlands and Water Resources. Tidal marsh, estuarine beach, seal haul-out, shorebird/wading bird roost, upland habitat enhancement plan, and beach geomorphic evolution monitoring. February 2009-December 2013. Client: National Audubon Society, Richardson Bay Audubon Sanctuary.

Tomales Dunes Biogeographic Assessment, Marin County. Prepared biogeographic assessment of plants, wildlife, and invertebrates of Tomales Dunes, Lawson Landing, Tomales Bay, Marin County (with David Wright, Ph.D., entomologist), 2004. Docent training and field trip leader, covering geomorphology, wetlands, plant communities (2003-present). May 2004. Client: Environmental Action Committee of West Marin (Point Reyes)

Marin Islands National Wildlife Refuge Vegetation Management Plan. Conducted surveys, prepared vegetation maps, recommended native plant community restoration and management strategies and techniques. GPS surveys and GIS mapping performed in collaboration with Jake Schweitzer, Wetlands and Water Resources. U.S. Fish and Wildlife Service, San Pablo Bay National Wildlife Refuge. 2004

Invasive nonnative vegetation management

Invasive Spartina Project (San Francisco Bay). Biological/Environmental consultant. Principal contributing author for biological resources, environmental impact analysis of Draft Environmental Impact Statement/Report, February 2003. Technical support for program development, project planning, scientific review and coordination. (Peggy Olofson, executive director ISP.) June 2002-2004; as-needed technical support and training.

CALFED/California Bay-Delta Authority Non-native Invasive Species Guidance for Proposals: prepared guidance document for grant proposals for control of non-native invasive species (NIS) in the California Bay-Delta, consistent with the CALFED Environmental Restoration Program. 2005.

Flooded Islands Feasibility Study: peer review. Prepared technical review of conceptual delta Flooded Islands rehabilitation/restoration planning document for CALFED/California Bay-Delta Authority. Spring 2005.

Cunningham Marsh Vegetation Management Plan. Prepared vegetation management plan for California Department of Fish and Game conservation easement of rare plant habitat (Pitkin Marsh lily), Sebastopol, Sonoma Co. September 2004 – May 2005. Client: California Native Plant Society

California Environmental Quality Act and National Environmental Quality Act

Bolinas Lagoon Invasive Spartina Project Initial Study. Biological subconsultant to Grassetti Enviromental Consulting, for Marin County Open Space District. Non-native estuarine vegetation eradication project. 2013-2014.

Larkspur Station Area Environmental Impact Report critical review. Assessment of biological resources analysis of DEIR prepared for Community Venture Partners, Mill Valley. 2014.

Dutch Slough Wetland Restoration Project Environmental Impact Report. Administrative draft author of biological resources impacts, mitigation, and alternatives sections; Grassetti Environmental Consulting Services, lead CEQA preparer for California State Coastal Conservancy and California Department of Water Resources; 1000 acre tidal wetland restoration project in Oakley, Contra Costa Co. (Sacramento Delta). 2005 – 2007.

San Francisco Bay Water Trail Environmental Impact Report. Subconsultant to Grassetti Environmental Consulting, lead wetland ecologist for administrative draft EIR impact assessment and mitigation, regional recreational water trail plan in San Francisco Estuary, California. 2007 – 2008.

Sears Point Restoration Project Environmental Impact Report. CEQA/NEPA and ecological design advisor, in collaboration with Jones and Stokes, U.S. Fish and Wildlife Service San Pablo Bay National Wildlife Refuge, and California Department of Fish and Game. 2007 - ongoing.

Ogunquit Beach Management Study Team: Environmental consultant, co-author, report on recommendations for management response to storm erosion of coastal dune restoration/flood control project. 1979.

Technical Advisory and Scientific Peer Review services

Lawsons Landing Scientific Review Panel. Coastal dune and dune wetland restoration and management advisor for Tomales Dunes, Marin County; supervised by California Coastal Commission. 2013-ongoing.

Montezuma Wetlands Technical Review. Scientific and technical advisor for multi-decade eastern Suisun Marsh tidal wetland restoration project; San Francisco Estuary Institute. 2012.

Dutch Slough Wetland Restoration, Adaptive Management Working Group. Participated in technical/scientific advisory panel participant for western Delta tidal marsh restoration project. California Dept. of Water Resources, State Coastal Conservancy, lead agencies. Fall 2003-2005. Client: Natural Heritage Institute, Berkeley, California.

Rodeo Lagoon, technical advisory workshop participation, June 2008; technical advisory services and memorandum for wetland restoration plans, September 2006.

Big Lagoon Restoration Project, technical/scientific peer review services for draft alternative restoration designs, draft feasibility study, Muir Beach, Marin Co. Fall 2002 - Winter 2004. Technical Advisory Group participation, Fall 2008-Winter 2009.

Sonoma Baylands Tidal Marsh Restoration Project: technical advisor. Technical/scientific peer review services for tidal marsh restoration monitoring report. Fall 2004 – Spring 2005.

San Francisco Estuary Project, San Francisco Bay Area Wetlands Restoration Program, Wetland Design Review Group. Technical consultant for scientific review panel, wetland habitat restoration designs in and around the San Francisco Estuary. Critical analysis of vegetation-sedimentation interaction, vegetation-wildlife relationships, revegetation plan design, reintroduction of uncommon/rare plants. January 2002-2004

Hamilton Wetlands Restoration Project: peer review of wetland restoration design. Participated in scientific advisory panel reviewing wetland restoration engineering, habitat design; U.S. Army Corps of Engineers, San Francisco District. June 2005.

Employment

U.S. Fish and Wildlife Service, Endangered Species Program, Sacramento Fish and Wildlife Office. February 1997 - June 2002. Botanist, GS-11

Principal author, administrative draft endangered species "Recovery Plan for Tidal Marsh Ecosystems of Central and Northern California", 800+ pp. and maps. Comprehensive geographic, habitat, and species recovery planning for the California clapper rail, salt marsh harvest mouse, California sea-blite, Suisun thistle, and soft-birds beak, with coverage of other special-status species and ecosystem functions. Submitted February, 2001.

Author, "Draft Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula", 221 pp. + appendices. 2001. Comprehensive biological evaluation and conservation planning for the federally endangered San Francisco lessingia (*Lessingia germanorum*), endemic annual herb of stabilized old coastal dunes, and Raven's manzanita (*Arctostaphylos hookeri* ssp. *ravenii*), evergreen low shrub of bedrock and serpentine soil outcrops. Final version expected September 2003.

USFWS representative to the San Francisco Bay Area Wetland Habitat Goals Project; contributed text and editing support to the Goals Report, lead author draft Plant Team recommendations, lead author of three (plant) chapters of the companion volume "Species and Community Profiles".

Other USFWS responsibilities: Prepared endangered species biological opinions (Section 7 consultations); provided technical support for staff review of mitigation and restoration plans in wetland and coastal habitats, invasive vegetation eradication, plant ecology, identification, and taxonomy. Provided technical assistance to San Francisco Bay National Wildlife Refuge complex, Suisun Ecological Workshop, National Park Service.

U.S. Army Corps of Engineers, Regulatory Branch, San Francisco District. 1991-1997. Ecologist, Regulatory Project Manager, GS-12. Selected representative roles and projects:

Environmental impacts analysis, regulatory project management, wetland jurisdictional delineation and analysis, National Environmental Policy Act and Endangered Species Act compliance, wetland restoration technical specialist.

Project manager, Montezuma Wetlands Project, 1993-1997 (EIS management, permit management, technical revisions of mitigation and design).

Project manager, Sonoma Baylands tidal marsh restoration project (regulatory; Sonoma Land Trust/Coastal Conservancy permit, not civil works project). 1995-1996.

Project manager, "Carl's Marsh" (Sonoma Land Trust, Petaluma River Marsh Restoration Project). 1994.

EIS cooperating agency representative, Hamilton Wetlands Project, 1995-1996.

Project manager, Leslie Salt/Cargill Salt dredge lock and levee regional permit, compliance, litigation (with USACE Office of Council and U.S. Department of Justice). 1991-1994,

Other bay-related regulatory functions and permits: Santa Clara Valley Water District, regional permit for flood control channel maintenance; Mosquito Abatement District regional permit for work in San Francisco baylands; Suisun and Sonoma Resource Conservation Districts, regional permits for levee and borrow ditch work; Roberts Landing (San Leandro, Alameda Co.) residential development and

marsh restoration; Redwood Shores (San Mateo Co.) residential development expansion; flood control and riparian restoration (Santa Clara Co.); pre-application interagency advisory panel.

University of Western Ontario, London, Ontario, Canada

Sabbatical replacement lecturer, 1988-1999: Vegetation of Ontario (for Prof. Diane Fahselt), Survey of the Plant Kingdom (for Prof. J.B. Phipps), Plant Evolution (for Prof. Diane Fahselt). Guest Lecturer, Plant Ecology (P.B. Cavers).

Recent public lectures, field trips

San Francisco Estuary Project

Nature-based ideas for shoreline resilience: State of the science and next steps
Co-author Sarah Richmond. Invited talk, State of the Estuary Conference. October 2013.

Shoreline resilience versus resistance: new roles for old coarse sediment shorelines in our submerging urban estuary. Co-author Roger Leventhal. Invited talk, State of the Estuary Conference, October 2011.

Vegetation at the rising bay's edge: reviving dynamic terrestrial-tidal ecotones. State of the Estuary Conference 2009

Picking Up the Pieces: Geography of Native Plant Diversity and Restoration in San Francisco Estuary Tidal Marshes. Invited talk, State of the Estuary Conference. October 2007.

Evaluating Restoration Success from the Perspective of Plants and Animals. Invited talk, with Nadav Nur, PRBO Conservation Science, lead author. State of the Estuary Conference, October 2005.

Tidal Restoration in Weedy Wetlands: Past, Present and Future. Invited talk, State of the Estuary Conference, October 2005.

California Native Plant Society, Dorothy King Young Chapter.

March 2007. Coastal Habitat Restoration in California: A Retrospective on Science, Trial, Error, and Luck.

Wetland vegetation of the Gualala River Lagoon – field trip, May 2004

Riparian vegetation of the lower Gualala River – field trip, June 2006

California Shore and Beach Preservation Association

Plants as indicators of ecology and geomorphology in California coastal environments. Invited lecture. April 2007.

Citizen's Committee to Complete the Refuge (San Francisco Bay) and California Native Plant Society, Santa Clara Valley Chapter

Tidal Marsh Ecology Short Course (3 days lecture and field trip): Geographic Variation in Tidal Marshes of the Lower San Francisco Estuary: Vegetation, Plants, Soils, and Landforms. March and May 2007.

Environmental Action Committee of West Marin –

Tomales Dunes (Dillon Beach Dunes) vegetation, geomorphology, and hydrology – annual field trips 2000-2007

Tomales Dunes: unique features of a restless landscape. Public lectures, October 2006, 2007

Friends of the Estuary (San Francisco Bay)

Perspectives on the CCMP actions for Aquatic Resources and Wildlife. Invited talk to Board of Directors, Friends of the Estuary (nonprofit affiliate of San Francisco Estuary Project). April 2005.

Madrone Audubon Society, Sonoma County –

Coastal Habitat Restoration in California: A Retrospective on Science, Trial, Error, and Luck. November 2007.

Marin Audubon Society – Tidal Marsh Ecology Short Course (3 days lecture and field trip): Geographic Variation in Tidal Marshes of the Lower San Francisco Estuary: Vegetation, Plants, Soils, and Landforms. May 2008

Elkhorn Slough NERR (National Estuarine Research Reserve, NOAA)

Planning and Regulation of Wetland Restoration and Management Projects in the San Francisco Estuary: An Introduction. Short course training lecture. August 2005.

JAWAN (Japanese Wetland Action Network)

Keynote speaker, regional (prefectural) symposia on wetland protection and restoration in Tokyo Bay, Isahaya Bay, Hakata Bay, Seto Inland Sea, Yoshino River Estuary. January 2005.

Pacifica School District, San Mateo County

Natural history field trips for elementary school classes, 2nd - 5th grade, to Linda Mar State Beach, San Pedro Creek, Pacifica. 2004-2007.

Society of Wetland Scientists

Lessons from history for the revitalization of the Bay. Invited lecture with Robin Grossinger, San Francisco Estuary Institute, lead author. Society of Wetland Scientists International Conference, June 2007.

U.S. Geological Survey

Geographic variation in historic and modern San Francisco Bay beaches. San Francisco Bay Sediment Workshop, USGS-San Francisco Bay Conservation and Development Commission, March, 2010.

Recent Publications

Grewell, B.J., P.R. Baye, and P.L. Fiedler. In press (2014). Shifting mosaics: vegetation of Suisun Marsh. Chapter 4 in Moyle, P.B., A.D. Manfree, and P.L. Fiedler (eds). 2014. Suisun Marsh: Ecological History and Possible Futures. University of California Press. 328 pp.

Baye, P.R. 2011. Tidal marsh vegetation of China Camp, San Pablo Bay, California. San Francisco Estuary and Watershed Science 10(2) http://escholarship.org/uc/item/9r9527d7

Whitcraft, Christine R.; Grewell, Brenda J.; Baye, Peter R. 2011. Estuarine vegetation at Rush Ranch Open Space Preserve, San Francisco Bay National Estuarine Research Reserve, California. San Francisco Estuary and Watershed Science 9(3) http://escholarship.org/uc/item/6j89531r

Whitcraft, C., Grewell, B.J., Baye, P.R. 2012. Tidal wetland vegetation and ecotone profiles: The Rush Ranch Open Space Preserve. In: Palaima, A., editor. Ecology, Conservation, and Restoration of Tidal Marshes. Berkeley, California: University of California Press. p. 113-114

Baye, Peter. 2008. Vegetation Management in Terrestrial Edges of Tidal Marshes, Western San Francisco Estuary, California. Marin Audubon Society, California. Funded by San Francisco Bay Joint Venture. Final Report and appendices. 2008.

Baye, Peter. 2007. Selected tidal marsh species of the San Francisco Estuary: a field identification guide. Invasive Spartina Project, Ingrid Hogle, editor. www.spartina.org.

Ayres, Debra R., Donald R. Strong, and Peter Baye. 2003. *Spartina foliosa* (Poaceae) – a common species on the road to rarity? Madrono 50:209-213.

Baye, Peter. 2005. San Francisco Bay salt pond restoration – dream or fugue? Special insert – Citizen's Committee to Complete the Refuge, Winter 2005.

Grossinger, Robin, and Peter Baye. 2004. Once and Future Bay: Lessons for Revitalizing the Bay. BayNature, Oct-December 2004. (Berkeley, CA).

Baye, P.R., P.M. Faber and B. Grewell. 2000. Tidal marsh plants of the San Francisco Estuary. In: Olofson, P.R., ed. 2000. Baylands Ecosystem Species and Community Profiles: life histories and environmental requirements of key plants, fish, and wildlife. Goals Project (Baylands Ecosystem Habitat Goals), San Francisco Bay Regional Water Quality Control Board, Oakland, California.

Peter R. Baye, Ph.D.
Coastal Ecologist
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ATTACHMENTS

STORM WATER SYSTEMS

CA Stormwater Compliance Data

Storm Water Case Studies

(last updated April 20, 2015)

Scrap Recycling Facilities Case Studies #1

	TSS		COD		HEM		Al		Cu		Fe		Pb		Zn	
Benchmarks	100		120		15		0.75		0.0636		1		0.0816		0.117	
Date	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Carson Scrap Recycler																
12/3/2012	68	18	160	20	-	-	0.56	0.24	ND	0.01	1.2	0.44	ND	0.016	0.31	0.13
12/27/2012	28	8	60	38	-	-	0.16	ND	0.015	ND	0.63	0.11	0.007	ND	0.11	0.11
1/24/2013	66	14	49	20	-	-	1.5	0.14	0.057	0.006	2.4	0.24	0.035	0.005	0.49	0.043
5/6/2013	36	4	220	59	-	-	0.54	ND	0.12	ND	1.2	0.033	0.047	ND	0.5	ND
Santa Rosa Scrap Recycler																
9/26/2014	3300	23	2000	120	30	4	9.8	0.047	0.12	0.0052	14	0.085	0.095	0.004	0.92	0.035
10/25/2014	93	9	340	230	5.2	2.4	1.9	0.098	0.11	0.012	3.2	0.37	0.024	0.003	0.65	0.065
10/31/2014	260	17	330	190	4.2	ND	6.8	0.23	0.052	0.0068	10	0.47	0.059	0.002	0.35	0.03
11/29/2014	170	3	170	39	4.3	ND	3.3	0.096	0.066	0.0075	5.1	0.21	0.029	ND	0.37	0.026
Los Angeles Scrap Recycler																
12/24/2012	20	ND	67	ND	7	ND	0.48	0.06	0.08	ND	0.71	0.074	0.018	ND	0.42	0.02
12/26/2012	190	ND	480	ND	77	ND	8.1	ND	0.94	ND	15	ND	0.47	ND	3.7	ND
01/24/2013	32	4	220	67	11	ND	1	0.41	0.17	0.043	2.1	0.72	0.055	0.02	0.87	0.25
03/08/2013	29	4	230	19	22	6.4	1	0.08	0.22	0.026	1.7	0.48	0.048	ND	0.71	0.09
03/08/2013	-	-	321	15	-	-	1.88	0.05	0.22	0.015	3.45	0.255	0.07	0.01	0.86	0.06
11/21/2013	-	ND	-	ND	-	ND	-	ND	-	0.01	-	0.38	-	ND	-	0.08
02/28/2014	48	6.8	200	28	16	3.1	1.2	0.08	0.27	0.033	2.1	0.36	0.11	0.01	0.58	0.1
12/2/2015	-	16	-	132	-	7	-	0.48	-	0.078	-	0.754	-	0.026	-	0.28

All Data in Mg/L Results highlighted in red are exceedances of the EPA Benchmark

Carson Scrap Recycler

Los Angeles Scrap Recycler

Scrap Recycling Facilities Case Studies #2

	TSS		COD		HEM		Al		Cu		Fe		Pb		Zn	
Benchmarks	100		120		15		0.75		0.0636		1		0.0816		0.117	
Date	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Downtown Los Angeles Scrap Recycler																
10/12/2012	74	38	770	180	15	4.8	1.3	0.2	1.6	0.019	2.6	0.56	0.32	0.006	1.2	0.037
12/3/2012	194	74	160	340	17	ND	5	0.059	1.1	0.022	7.6	0.06	0.9	ND	1.5	ND
12/18/2012	46	ND	220	ND	8.9	ND	1.3	0.041	0.41	ND	2.5	ND	0.33	ND	0.61	ND
12/26/2012	47	ND	240	24	100	ND	0.68	ND	0.3	ND	0.97	ND	0.19	ND	0.36	ND
1/24/2013	280	4	420	16	15	ND	11	0.15	1.3	0.028	13	0.2	1.1	0.013	2.2	0.048
3/8/2013	41	14	-	-	7.8	ND	1.1	0.2	0.42	0.042	1.7	0.2	0.17	0.009	0.71	0.058
5/6/2013	160	6	630	ND	38	ND	0.46	ND	0.22	ND	0.56	0.036	0.058	ND	0.61	ND
2/28/2014	120	13	110	ND	6.2	ND	3.1	0.3	0.52	0.048	4	0.32	0.43	0.006	1	0.13
Long Beach Scrap Recycler																
11/29/2013	104	522	410	180	7	ND	1.8	31	0.34	0.078	3.9	4.4	0.14	0.079	0.77	0.17
12/19/2013	256	28	680	150	12	ND	4.9	0.54	0.45	0.042	18	1.1	0.66	0.028	1.4	0.15
2/28/2014	1100	9.6	330	100	340	ND	10	0.21	1.4	0.024	28	1	0.98	0.009	4.3	0.067
Windsor Scrap Recycler																
2/6/2015	190	22	86	ND	2.2	ND	5.9	0.64	0.029	0.0076	8.2	0.82	0.029	ND	0.19	0.035

All Data in Mg/L Results highlighted in red are exceedances of the EPA Benchmark

Downtown LA Scrap Recycler

Waste Hauling Facilities Case Studies

	TSS		COD		HEM		Al		Cu		Fe		Pb		Zn	
Benchmarks	100		120		15		0.75		0.0636		1		0.0816		0.117	
Date	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Sacramento Waste Hauler																
2/02/2014	-	13	-	41	-	ND	-	1.6	-	ND	-	0.5	-	ND	-	ND
2/06/2014	-	19	-	115	-	45	-	ND	-	ND	-	0.15	-	ND	-	0.1
2/06/2014	42	14	55	22	2	ND	0.6	0.6	0.01	0.004	0.7	0.4	0.006	ND	0.12	0.02
2/07/2014	330	160	460	630	8.4	4.9	0.7	0.1	0.01	0.01	1	0.1	0.01	ND	0.06	0.02
2/26/2014	48	ND	660	ND	1.4	ND	0.2	0.04	0.05	ND	1.1	ND	0.004	ND	0.68	0.01
2/28/2014	63	ND	48	ND	2.4	ND	1.4	0.15	0.01	ND	1.7	0.2	0.01	ND	0.12	0.004
2/28/2014	320	20	200	27	-	-	4.2	0.32	0.03	0.01	4.7	0.4	0.04	ND	0.21	0.07
3/05/2014	-	4	-	50	-	43	-	ND	-	ND	-	ND	-	ND	-	0.05
3/26/2014	300	15	380	62	-	-	3.9	0.22	0.051	0.0057	5.8	0.56	0.059	ND	0.48	0.042
3/26/2014	130	ND	280	61	5.8	ND	2.6	0.084	0.035	0.0031	3.8	0.25	0.035	ND	0.34	0.019
3/26/2014	-	15	-	151.7	-	9	-	ND	-	ND	-	0.457	-	ND	-	0.116
4/25/2014	140	15	83	45	4.3	ND	2.1	0.19	0.02	0.0034	3.2	0.66	0.025	0.003	0.19	0.034
9/26/2014	-	24	-	42	-	ND	-	0.25	-	0.025	-	0.34	-	0.015	-	0.41
10/15/2014	-	13	-	204	-	14.5	-	ND	-	ND	-	1.837	-	ND	-	ND
10/25/2014	-	11	-	121	-	13.5	-	ND	-	ND	-	2.758	-	ND	-	0.024
10/31/2014	170	19	690	120	ND	ND	2.4	0.15	0.063	0.0087	3.6	0.92	0.026	0.004	0.8	0.1
11/30/2014	7	6.8	65	52	-	-	0.081	0.088	0.01	ND	0.19	0.4	ND	ND	0.094	ND
Santa Rosa Waste Hauler																
11/27/2013	74	8.6	480	210	ND	ND	1.5	0.3	0.022	ND	2.6	0.23	ND	ND	0.35	ND
1/23/2014	78	11	530	79	ND	ND	0.9	0.17	ND	ND	3.2	0.64	ND	ND	0.11	0.022
10/31/2014	550	7.8	320	67	32	ND	9.4	0.11	0.077	0.0025	16	0.29	0.14	0.002	0.82	0.018
11/19/2014	230	32	330	-	-	-	8.5	0.57	0.047	0.013	9.7	0.87	0.068	0.048	0.42	0.064
12/2/2014	52	13	190	57	-	-	12	0.24	0.13	0.0075	16	0.51	0.19	0.005	0.82	0.041

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Santa Rosa Waste Hauler

Scrap Recycling Facility #1 (click here to print)

Scrap Recycling Facility #2 (click here to print)

Waste Hauling Facility (click here to print)


Treatment
STORM WATER
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Technology

Stormwater Enhanced Media

Enhanced Media

Enhanced medias are designed to remove organics, nutrients, and dissolved metals. Certain medias are designed to remove certain contaminants and there is no one media that can remove everything. Also, enhanced medias need time to work so the larger the media vessel is the better removal rates will be achieved. Storm water effluent data should be evaluated carefully to determine how much and what type of medias should be used and in what order they should be installed. This is critical to achieve benchmarks.

(last updated March 13, 2013)

Waste Hauling Facilities Case Studies

	TSS		COD		HEM		Al		Cu		Fe		Pb		Zn	
Benchmarks	100		120		15		0.75		0.0636		1		0.0816		0.117	
Date	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Sacramento Waste Hauler																
2/02/2014	-	13	-	41	-	ND	-	1.6	-	ND	-	0.5	-	ND	-	ND
2/06/2014	-	19	-	115	-	45	-	ND	-	ND	-	0.15	-	ND	-	0.1
2/06/2014	42	14	55	22	2	ND	0.6	0.6	0.01	0.004	0.7	0.4	0.006	ND	0.12	0.02
2/07/2014	330	160	460	630	8.4	4.9	0.7	0.1	0.01	0.01	1	0.1	0.01	ND	0.06	0.02
2/26/2014	48	ND	660	ND	1.4	ND	0.2	0.04	0.05	ND	1.1	ND	0.004	ND	0.68	0.01
2/28/2014	63	ND	48	ND	2.4	ND	1.4	0.15	0.01	ND	1.7	0.2	0.01	ND	0.12	0.004
2/28/2014	320	20	200	27	-	-	4.2	0.32	0.03	0.01	4.7	0.4	0.04	ND	0.21	0.07
3/05/2014	-	4	-	50	-	43	-	ND	-	ND	-	ND	-	ND	-	0.05
3/26/2014	300	15	380	62	-	-	3.9	0.22	0.051	0.0057	5.8	0.56	0.059	ND	0.48	0.042
3/26/2014	130	ND	280	61	5.8	ND	2.6	0.084	0.035	0.0031	3.8	0.25	0.035	ND	0.34	0.019
3/26/2014	-	15	-	151.7	-	9	-	ND	-	ND	-	0.457	-	ND	-	0.116
4/25/2014	140	15	83	45	4.3	ND	2.1	0.19	0.02	0.0034	3.2	0.66	0.025	0.003	0.19	0.034
9/26/2014	-	24	-	42	-	ND	-	0.25	-	0.025	-	0.34	-	0.015	-	0.41
10/15/2014	-	13	-	204	-	14.5	-	ND	-	ND	-	1.837	-	ND	-	ND
10/25/2014	-	11	-	121	-	13.5	-	ND	-	ND	-	2.758	-	ND	-	0.024
10/31/2014	170	19	690	120	ND	ND	2.4	0.15	0.063	0.0087	3.6	0.92	0.026	0.004	0.8	0.1
11/30/2014	7	6.8	65	52	-	-	0.081	0.088	0.01	ND	0.19	0.4	ND	ND	0.094	ND
Santa Rosa Waste Hauler																
11/27/2013	74	8.6	480	210	ND	ND	1.5	0.3	0.022	ND	2.6	0.23	ND	ND	0.35	ND
1/23/2014	78	11	530	79	ND	ND	0.9	0.17	ND	ND	3.2	0.64	ND	ND	0.11	0.022
10/31/2014	550	7.8	320	67	32	ND	9.4	0.11	0.077	0.0025	16	0.29	0.14	0.002	0.82	0.018
11/19/2014	230	32	330	-	-	-	8.5	0.57	0.047	0.013	9.7	0.87	0.068	0.048	0.42	0.064
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All Data in Mg/L

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Santa Rosa Waste Hauler

Stormwater Enhanced Media

Enhanced Media

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(last updated March 13, 2013)


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Treatment
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Technology

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BY ELECTRONIC EMAIL

January 15, 2016

Xavier Fernandez, Environmental Scientist
California Regional Water Quality Control Board,
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612
xavier.fernandez@waterboards.ca.gov

Re: Application for Water Quality Certification for Dutra Haystack Asphalt Plant Project, Sonoma County - CIWQS Place ID 767268, Corps File No. 28104N

Dear Mr. Fernandez and Members of the Board,

I am writing on behalf of the Petaluma River Council, Friends of Shollenberger Park, Moms for Clean Air, Petaluma Tomorrow and their members living in and around Petaluma, California and Sonoma County, and on behalf of Petaluma residents David Keller, Margie Helm, Andrew Packard and Ryan Phelan (collectively "Council") concerning the Dutra Haystack Landing Asphalt Plant (PN No. 2003-281040) ("Project") application for water quality certification. The Council has been involved in the review process for the Project since it was proposed over seven years ago and has submitted comments to the U.S. Army Corps of Engineers ("USACE"), the Sonoma County Board of Supervisors, and the California Regional Water Quality Control Board ("Regional Board") identifying many objectionable aspects of the proposed project. To assist in the review of the documents submitted as part of the Dutra application, my office has retained expert coastal ecologist Dr. Peter R. Baye and hydrogeologist, Matthew Hagemann, C.Hg. Given Dutra's repeated failures to conduct thorough assessments of environmental impact and provide full information on those impacts and its proposed mitigation measures, as well as the blight on their community they believe will result if a large asphalt plant is located adjacent to the Petaluma River at the gateway to Petaluma, the Council and many other Petaluma residents have maintained a steadfast opposition to the Project for the last seven years. Dutra's latest submissions seeking a certification under Section 401 of the federal Clean Water Act is no exception.

Section 401 of the Clean Water Act requires federal agencies to meet state water quality standards to obtain permits for federal projects (33 U.S.C. § 1341; *See San Joaquin River Exch. Contractors Water Auth. v. State Water Res. Control Bd.* (2010) 183 Cal. App. 4th 1110, 1112.)

Dutra submitted its first application for certification under Section 401 of the Clean Water Act (CWA), 33 U.S.C. §1341 in December of 2014. With the assistance of Dr. Baye, the Council submitted comments to Dutra's first application for water quality certification in March of 2015. (See Exhibit C, Mar. 23, 2015 Letter). In that letter, Dr. Baye noted a number of serious technical and scientific problems in the proposed Project, including the omission of numerous fundamental components necessary to determine the feasibility of Dutra's proposed constructed wetland projects, reliance on out-dated biological surveys, and the company's failure to consider the impacts of the Project's emissions of pollutants in both storm water and to the air on the proposed wetlands, among other issues. On March 13, 2014, the Regional Board sent a letter to the Dutra Group stating that their application was incomplete and outlining a number of inadequacies in their application, including an insufficient alternatives analysis, failure to offset wetland habitat destruction, and an insufficient stormwater management plan. The Dutra Group now has resubmitted its 401 certification application. However, a thorough review reveals that Dutra's application still remains deficient and warrants denial of certification under Section 401.

Proposed Mitigation

In response to USACE's Public Notice under Section 404 of the Clean Water Act (33 U.S.C. § 1344 *et seq.)* issued in September of 2015, Dr. Baye provided expert comments citing Dutra's failure to address a number of impacts at the core of the Regional Board's jurisdiction. His letter, attached as Exhibit A, concludes that Dutra's wetland mitigation plan is "basically flawed and infeasible on its own terms." First and foremost, Dr. Baye reports that the application suffers from a fundamental failure to integrate compatible water "beneficial uses" and impacts. Dutra's plan is to utilize the same tidal and nontidal ditch system (1) to drain contaminated industrial runoff (containing both industrial contaminants and salts from dust control irrigation); (2) to provide water intake supply; *and* (3) act as compensatory mitigation habitat in "enhanced" wetlands. Upon reviewing Dutra's water quality certification application, this problem could be easily missed because that application addresses drainage, water supply, runoff, contaminants, and wetland habitat separately. However, when these components are viewed together it becomes clear that this proposal is self-defeating—to drain industrial contaminants into the ditches that are the main channels in the mitigation site undermines the basic conservation purpose of those sites.

Dr. Baye also found that the project, as designed, will send contaminant storm water runoff to tidal ditches and proposed mitigation wetlands. Dr. Baye finds substantial evidence that the project would cause significant degradation of on-site wetlands, including proposed compensatory mitigation sites due to incompatible uses of tidal drainage ditches for conveyance of contaminated stormwater runoff carrying toxins, salts and nutrients; water supply intake for dust control; and basic hydraulic connectivity to on-site wetlands. Moreover, despite previous Board comments, Dutra's invasive species management plan remains unsound and lacks sufficient monitoring. Dutra only compiled generalized upland weed control methods and applied them to wetlands, which created numerous problems, such as calling for the application of herbicides that are not authorized for use in wetlands. In addition, Dr. Baye

details the numerous ways in which the vegetation plans are inappropriate and infeasible for practical and legal reasons, and in some cases mistaken (such as incorrectly referring to a non-native plant as native). Dr. Baye also notes the complete lack of affirmative species composition targets or rejection criteria, which he asserts is "a basic and professionally unacceptable deficiency" that renders the wetland mitigation plan's specifications for seasonal wetland target vegetation "woefully incomplete." Based on the numerous short-comings of the plan, Dr. Baye concludes that "the proposed wetland mitigation plan is unlikely to offset the project's overall wetland impacts in either the short-term… or long-term…, especially for wetland habitat functions."

Stormwater Management Plan

In addition, Dutra's stormwater management plan remains inadequate. The review by Matt Haggeman of SWAPE, attached as Exhibit B, concludes that the Conditions of Approval are inadequate to control and treat stormwater during operation. He explains that the proposed sand filter is insufficient to treat asphaltic oils and crumb rubber asphalt components likely to be generated from the site. As such, the proposed sand filtration system is inadequate to meet Best Available Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) required to achieve performance standards under the California Industrial General Permit (Order 2014-0057-DWQ). Failure to properly treat these chemicals will result in these chemicals being directly discharged into the Petaluma River. To prevent these unlawful discharges into the Petaluma River, the Conditions of Approval should require the implementation of an active storm water treatment system employing advanced media designed to effectively remove all of the pollutants expected to be released via storm water at the asphalt facility. Such systems are readily available and necessary to treat all of the pollutants expected in Dutra's storm water discharges. Accordingly, such treatment is required to achieve the Clean water Act's and industrial storm water permit's BAT/BCT requirement.

Project Description

Finally, Dutra's application provides an incomplete project description. Through a Public Records Act request to the Sonoma-Marin Area Rail Transit District ("SMART"), the Council has just uncovered that Dutra submitted a request to SMART that any agreement include permission to construct a "tail track" on site. Dutra's project description included in the final EIR prepared by the County of Sonoma lacks any indication of intent to construct a tail track or how such construction may impact wetlands or stormwater management. As such, Dutra's project description remains incomplete, requiring recirculation under Section 404 of the Clean Water Act. The Council will send supplemental comments to USACE notifying them that recirculation of their public notice is required. Because the present Project description leaves the Board ill-equipped to consider the full impacts of the project, water quality certification under Section 401 should be put on hold until this issue is addressed.

Please let me know if you have any questions. Thank you for your consideration of Dr. Baye's and Mr. Hagemann's reviews and my clients' ongoing concerns questioning the wisdom of constructing and operating a proposed asphalt plant at that location.

Sincerely,

Michael R. Lozeau
Lozeau Drury LLP
Attorneys for Petaluma River Council, Friends of Shollenberger Park, and Moms For Clean Air

Exhibits:

A) Peter Baye, Ph.D., Environmental assessment of Dutra Haystack Asphalt Plant

B) Matthew Hagemann, C.Hg. Comments on Dutra Haystack Asphalt Plant Stormwater Impact

C) Mar 23, 2015 Letter to San Francisco Water Quality Control Board

Fernandez, Xavier@Waterboards

From: Meredith Wilensky <meredith@lozeaudrury.com>
Sent: Monday, January 25, 2016 3:00 PM
To: Fernandez, Xavier@Waterboards; Mike Lozeau; David Keller
Subject: Re: Comments RE Water Quality Certification Application for Dutra Haystack Asphalt Plant Project
Attachments: 2016.1.25 404 PN Suppl. Letter re Tail Track.pdf; Ex. 1 Letter to Farhad Mansourian from Al Cornwell re Tail Track (12-5-11).pdf

Hi Xavier,

We have just submitted supplemental comments to USACE's Section 404 public notice on behalf of the Petaluma River Council et. al. Since we refer to these comments in our 401 certification letter, I am sending along a copy for your reference.

Cheers,
Meredith

On Tue, Jan 19, 2016 at 10:32 AM, Fernandez, Xavier@Waterboards <Xavier.Fernandez@waterboards.ca.gov> wrote:

I was able to download the comments.

Thank you,

Xavier

From: Meredith Wilensky [mailto:meredith@lozeaudrury.com]
Sent: Friday, January 15, 2016 5:08 PM
To: Fernandez, Xavier@Waterboards
Cc: Mike Lozeau; David Keller
Subject: Comments RE Water Quality Certification Application for Dutra Haystack Asphalt Plant Project

Dear Xavier:

Please find here (and in the link below) the documents consisting of Lozeau Drury's comment letter regarding Water Quality Certification Application for Dutra Haystack Asphalt Plant Project on behalf of the Petaluma River Council, et. al.

Please let me know if you have any issues accessing the files.

Best,

Meredith Wilensky

https://www.dropbox.com/sh/q3vkerxy4m65yas/AABlScbkHT8Mpom6hdrHQAp7a?dl=0

On Thu, Dec 10, 2015 at 3:33 PM, Fernandez, Xavier@Waterboards <Xavier.Fernandez@waterboards.ca.gov> wrote:

Dear Interested Parties:

The San Francisco Bay Regional Water Quality Control Board (Water Board) received an application for a Clean Water Act Section 401 Water Quality Certification (Application) for the Dutra Haystack Asphalt Plant Project (Project). The proposed Project would construct an asphalt plant facility and associated conveying system on the approximately 35-acre Haystack Landing site, located at 3355 Petaluma Boulevard South.

The Application for the Project is available for public review on line at: http://www.waterboards.ca.gov/sanfranciscobay/public_notices/401/dutra/index.shtml.

Comments on the Application will be accepted by the Water Board for 21 days, and may be submitted via email to: xavier.fernandez@waterboards.ca.gov, or by sending hardcopies to: 1515 Clay St., Oakland, CA, Suite 1400, to the attention of Xavier Fernandez. **Comments on the Application must be submitted no later than January 1, 2015.**

If you have any questions or concerns, please contact me via phone at 510-622-5685 or email at xavier.fernandez@waterboards.ca.gov.

Regards,

Xavier Fernandez

Environmental Scientist

SF Bay Regional Water Quality Control Board

510-622-5685

xavier.fernandez@waterboards.ca.gov

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Meredith Wilensky

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BY ELECTRONIC MAIL and MAIL January 25, 2016

Bryan Matsumoto
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San Francisco, CA 94103-1398
415-503-6786
bryan.t.matsumoto@usace.army.mil

RE: SUPPLEMENTAL COMMENTS ON DUTRA HAYSTACK LANDING ASPHALT PLANT PROJECT (PN No. 2003-281040)

Dear Mr. Matsumoto:

I am writing on behalf of the Petaluma River Council, Friends of Shollenberger Park, Moms for Clean Air, Petaluma Tomorrow and their members living in and around Petaluma, California and Sonoma County, and on behalf of Petaluma residents David Keller, Margie Helm, Andrew Packard and Ryan Phelan (collectively "Council") concerning the Dutra Haystack Landing Asphalt Plant (PN No. 2003-281040) ("Project"). Please accept these supplemental comments to the U.S. Army Corp of Engineers' ("USACE") 404 Public Notice (PN) dated September 15, 2015. It has come to the Council's attention that Dutra's Haystack Landing Asphalt Plant Section 404 application suffers from additional issues to those delineated in the Council's November 30, 2015 comments. Specifically, it appears that Dutra's project description fails to account for the construction of a "tail track" on the Project site.

Through a Public Records Act request to the Sonoma-Marin Area Rail Transit District ("SMART"), the Council has discovered a letter, (attached hereto as Exhibit 1) from Al Cornwell, a representative of Dutra Group, to SMART in which Cornwell requests that "the license agreement between SMART and The Dutra Group allowing the conveyor also include the provision to allow a tail track to be added to serve the Haystack Asphalt and Gravel facility in the future." Dutra's project description included in the final EIR prepared by the County of Sonoma lacks any indication of intent to construct a tail track or how such construction may impact surrounding wetlands. If the "tail track" is intended for unloading aggregate, one would

reasonably expect it to require truck and loader access alongside it. However, given the site dimensions, it appears impossible to allow for such access on the current site alignment. This raises a substantial question as to whether such a feature would destroy further onsite wetlands.

The USACE Regulations pertaining to Section 404 of the Clean Water Act provide that the PN is the "primary method of advising all interested parties of the proposed activity" and **"must, therefore, include sufficient information . . . to generate meaningful comment."** (33 CFR 325.3) (emphasis added). Specifically, the regulations require that the PN contain:

> (5) A brief description of the proposed activity, its purpose and intended use, so as to provide sufficient information concerning the nature of the activity to generate meaningful comments, including a description of the type of structures, if any, to be erected on fills or pile or float-supported platforms, and a description of the type, composition, and quantity of materials to be discharged or disposed of in the ocean.

(33 CFR 325.3(a)(5).) A tail track unquestionably qualifies as a "structure . . . to be erected on fills or pile . . . . "(*Id.*) Should Dutra have plans to construct a tail track on site, the PN fails to adhere to this standard by completely leaving out any reference to this feature or potential wetland impacts that may result from its construction. (*See Nat'l Wildlife Fed'n v. Marsh* (1983) 568 F. Supp. 985, 995-96 ("[U]nder section 404 of the CWA, the opportunity to comment . . . necessarily require that the Army present for public scrutiny the rationale and pivotal data underlying its proposed action before the close of the comment and hearing period.")) Dutra should not be permitted to evade meaningful public review of its proposed projects by adopting a piecemeal approach to construction. Should Dutra plan to construct a tail track, it must be included in their project proposal. Therefore, the Council respectfully requests that USACE recirculate the PN with additional information related to the potential construction of a tail track serving the Dutra Haystack Asphalt facility.

Respectfully submitted,

LOZEAU DRURY LLP

Michael Lozeau

cc: David Keller

EXHIBIT 1

45 Leveroni Court
Novato, CA 94949
www.cswst2.com

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Fax 415.883.9835

Novato
Petaluma
Sacramento

CSW | ST2
CSW/Stuber-Stroeh Engineering Group, Inc.

Engineers | Land Planners | Surveyors | Landscape Architects

Date: December 2, 2011
File: 5.913.02

Mr. Farhad Mansourian
General Manager
SMART
490 Mendocino Ave., Suite 102
Santa Rosa, CA 95401

RE: REQUEST FOR TAIL TRACK NEAR MP 5-36.45, PROJECT 591302

Dear Mr. Mansourian:

In 2006 the Dutra Group applied for a license to place a conveyor over the tracks in the vicinity of MP 5-36.45. We have been working closely with your staff to work through an agreement that would permit this facility. During our discussions, your staff raised the possibility of adding a tail track to the rail facility in this area to provide a rail connection to move gravel to and from the Haystack site.

On behalf of The Dutra Group and Peachtree properties we request that the license agreement between SMART and The Dutra Group allowing the conveyor also include the provision to allow a tail track to be added to serve the Haystack Asphalt and Gravel facility in the future.

We appreciate SMART's consideration of this request. If you have any questions please feel free to contact me.

Sincerely,

CSW/STUBER-STROEH ENGINEERING GROUP, INC.

Al Cornwell
R.C.E. #27577

AC:sef
cc: Bill Dutra, Dutra Group
Molly Jacobson, Dutra Group
Laura Giraud, SMART

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