FLOOD CONTROL ZONE 3 ADVISORY BOARD MEETING
MAY 25, 2017

STAFF REPORT

Item 1. Approval of Meeting Minutes: April 20, 2017

Recommended Action: Approve minutes.

Item 2. Open Time for Items Not on the Agenda

Comments will be heard for items not on the agenda (limited to three minutes per speaker).

Item 3. Zone Engineer's Report

a. Fiscal Year 2015-16 Budget vs Actual Review

At the April 20, 2017 Advisory Board (AB) meeting, the AB requested staff provide the AB with the Fiscal Year (FY) 2015-16 budget to compare with the FY 2015-16 actual expenses. The requested document is in the Board Packet for today's meeting.

b. Fiscal Year 2016-17 Expenses Update

At the April 20th AB meeting, the AB requested staff provide the AB with FY 2016-17 current expenses. The requested document is in the Board Packet for today's meeting.

Labor charges reflect the first three quarters of the 2016-17 fiscal year. Expense charges reflect expenses booked through April 30, 2017.

Prior to the close of the fiscal year, there will be additional operational expenses (labor and expenses) that have yet to be booked.

Also, non-booked expenses of $787,101 are projected to be booked (Mill Valley Agreements, Marin City Study).

Total revenues include one-time grant awards that total $313,398 (Department of Water Resources Grant, Transportation Authority of Marin-Marin City Study Grant, North Bay Watershed Association, Bothin Marsh Grant).

Projected fourth quarter expenses:

Labor	$147,300
Mill Valley/Marin City Contracts	$787,100
Services and Supplies	$77,800
Total Q4 Estimate	$1,012,200

Projected FY 2016-17 Expenses : $1,280,984 + $1,012,200 = $2,293,184 (current actuals)

c. Tennessee Valley Pathway Wetland Restoration Project

At the April 20th AB meeting, the AB requested staff provide the AB with the concept-level design plan for the Tennessee Valley Pathway Wetland Restoration Project. The requested document is in the Board Packet for today's meeting.

Subsequent to the April 20th AB meeting, staff has determined that the project location includes District-owned property and County-owned property (please see enclosed exhibit for details). The District is working with the County of Marin to resolve this ownership issue as it relates to costs for this restoration.

Staff has included in the Board Packet a Cost-Allocation Breakdown that estimates the percentage of the work that occurs on both District and County properties. The District portion of the work is estimated to be 32% of the total project. Applying this 32% to the total project estimated cost of $284,570 allocates $91,062 of the work to District-owned property. Applying an additional 30% contingency to the $91,062 allocates $118,381 of the work to District-owned property. Staff has adjusted the FY 2017-18 budget to reflect this Zone 3 estimated project cost of $118,400.

d. Review of District Properties in Zone 3

At the April 20th AB meeting, the AB requested staff provide the AB with information on District properties in Zone 3. Included in today's Board packet is the requested information.

Item 4. Zone 3 FY 2017-18 Budget Review

The Zone 3 budget for FY 2017-2018 (begins July 1, 2017 and ends June 30, 2018) will be presented to the Board of Supervisors at a hearing this spring. A proposed budget summary will be presented to the AB by staff for review.

Recommended Action: Recommend Board of Supervisors approve budget.

Item 5. Consider Amending Existing Agreement with the City of Mill Valley for a Comprehensive Flood Control and Master Drainage Plan

On July 19th 2016, the District Board of Supervisors approved an agreement with the City of Mill Valley that provides Zone 3 funds for a Mill Valley Comprehensive Flood Control and Master Drainage Plan (Plan). This agreement provides $265,000 of Zone 3 funds for the Plan based on a project estimate provided by the City of Mill Valley. The City of Mill Valley is requesting an increase of $110,000 to fund the Plan, bringing the requested total Zone 3 funding of the Plan to 375,000. The previously agreed upon amount of $265,000 provides for 70% of this new-project cost.

This project has been divided into two Phases, and District staff has been working with City staff on refining Phase 1 to ensure that Phase 1 delivers a Flood Control and Master Drainage Plan, as well as concept-level-design CIP alternatives and their attending costs. Phase 1 includes public outreach and engagement, a funding strategy study, data collection and review, sea level

rise considerations, existing conditions analyses, and coordination with stakeholders. The Phase 1 cost is $265,000, and this cost has been budgeted with Zone 3 funds via the existing agreement between the District and the City of Mill Valley. The latest schedule provided by the City estimates Phase 1 completion in July of 2018. Phase 2 is estimated to cost $110,000, and focuses on funding strategies, environmental analysis, and post-Plan-completion outreach that focuses on funding and public willingness to pay for CIPs. This additional cost for Phase 2 has not been budgeted with Zone 3 funds.

A letter of from the City of Mill Valley, dated May 16, 2017, requesting the additional $110,000 is included in this AB meeting packet. Additionally, Phase 1 and Phase 2 descriptions and cost breakdowns are included in the AB meeting packet. This increased amount is not included in the proposed FY 2017-18 budget presented in Item 4, yet the AB can add this increase if the AB desires.

At this time, staff does not recommend the Advisory Board recommend that the District Board of Supervisors increase the budget for Phase 2 of the Plan. Phase 1 improvement alternatives have yet to be determined, and staff recommends completing the Phase 1 scope of work, development of a Mill Valley Comprehensive Flood Control and Master Drainage Plan, before considering a Zone 3 budget allocation for funding strategies and outreach.

Recommended Action: Staff recommends that the AB not recommend this funding increase to the Board of Supervisors at this time.

Item 6. Schedule Next Meetings

At today's meeting, the Advisory Board and District staff shall schedule all regular meetings to be held in the 2017 calendar year. If, as the meeting date approaches, there is no business proposed to be conducted, the meeting may be canceled by District staff by noticing the Advisory Board and providing a written update on Zone activities. In addition, special meetings may be called by the District Engineer when Marin County Flood Control and Water Conservation District business needs so dictate. Special meetings may also be called at the request of the Advisory Board Chair.

Proposed meetings dates for 2017: September 28, 2017, December 7, 2017.

FY 2015 - 2016 Budget Report
FCZ #3 Mill Valley
Fund 23720

Budget Summary

Account Description	FY 2014-15 Budget	FY 2014-15 Projected	FY 2015-16 Budget
Fund Beginning Balance	**$5,894,493**	**$7,341,391**	**$7,264,574**
Expenses			
Salaries and Benefits	$848,844	$814,298	$856,182
Service and Supplies	$1,314,428	$752,991	$1,436,996
Capital Assets	$0	$0	$0
Total Expenditures	**$2,163,272**	**$1,567,289**	**$2,293,178**
Revenue			
Taxes	$1,467,168	$1,467,168	$1,467,168
Revenues From Use of Money and Property	$14,984	$4,790	$4,500
Intergovernmental Revenues	$9,000	$9,000	$9,000
Miscellaneous Revenues (inc. traffic)	$900	$9,514	$900
Total Revenue	**$1,492,052**	**$1,490,472**	**$1,481,568**
Fund Ending Balance	**$5,223,273**	**$7,264,574**	**$6,452,964**

Major "Services & Supplies" Expenditures

Professional Services			
Services to Support Ongoing Coyote Creek Projects	$25,000	$0	$100,000
Balance of previously encumbered contracts	$0	$192,541	$0
Study Contingency	$50,000	$75,000	$75,000
Total	**$75,000**	**$267,541**	**$175,000**
Construction			
Coyote Creek Middle Reach Dredging	$900,000	$0	$900,000
Total	**$900,000**	**$0**	**$900,000**
Maintenance & Repair Services - Equipment			
Major Pump Maintence	$80,000	$80,000	$90,000
Balance of previously encumbered contracts	$0	$83,075	$0
Miscellaneous	$29,900	$30,500	$31,920
Total	**$109,900**	**$193,575**	**$121,920**
Maintenance & Repair Services - Land & Buildings			
Rodent Abatement	$15,000	$ 15,000	$15,000
Conservation Corps North Bay	$80,900	$ 80,900	$80,900
Mill Valley Creek Maintenance MOU	$35,000	$ 35,000	$35,000
Balance of previously encumbered contracts	$0	$ 51,447	$0
Miscellaneous	$31,100	$ 31,100	$31,100
Total	**$162,000**	**$213,447**	**$162,000**
Miscellaneous Services & Supplies	**$67,528**	**$78,428**	**$78,076**

Zone 3 2016-17 Expenses Update

FY 2015-2016 Fund Ending Balance: $ 8,297,665

Proposed budget, subject to change

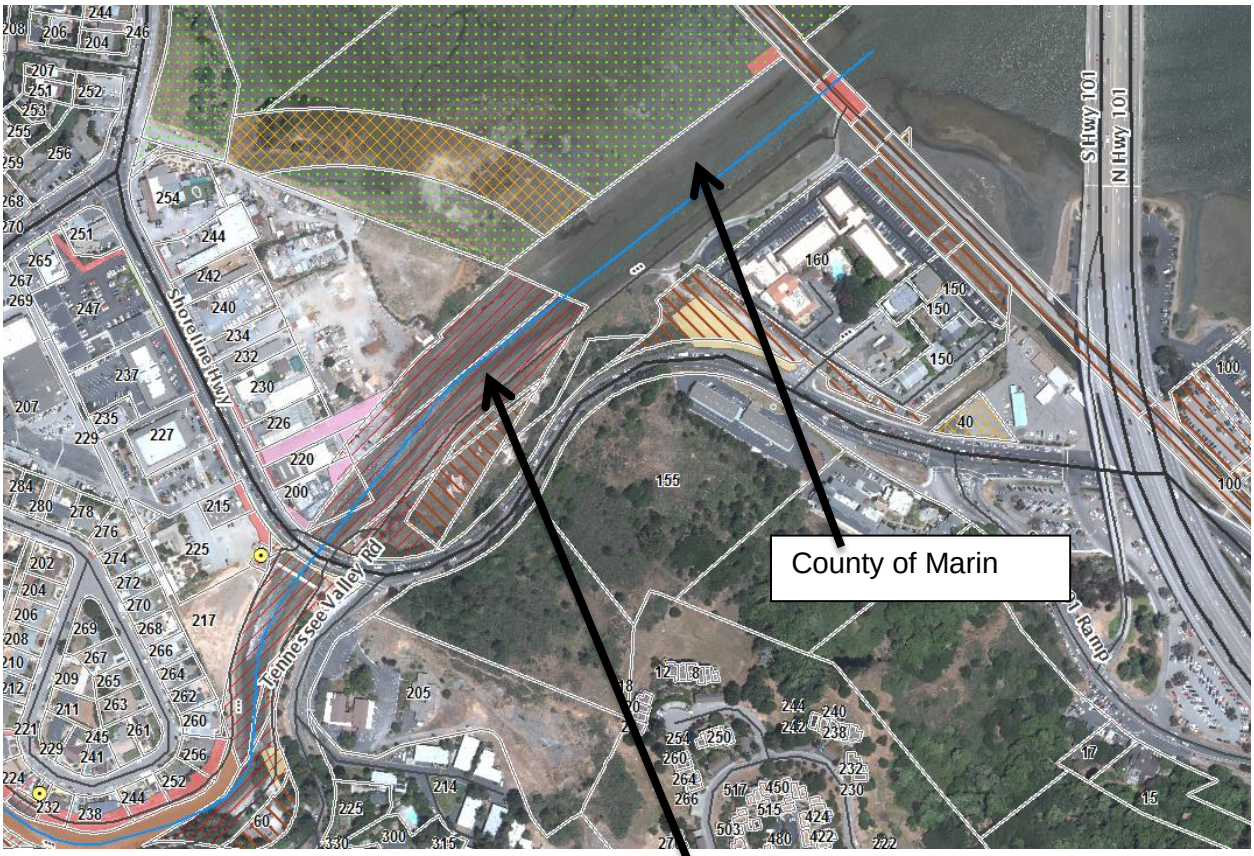
Expected Expenditure Description Many expenditures include 3% annual increase	**FY 2016-17 YTD[1]**	**FY 2016-17 Budget**
Staffing Costs		
Pump Operation & Maintenance		$ 95,000
Creek and Levee Maintenance		$ 100,000
General Zone and USACE Project Administration		$ 175,000
Engineering Planning		$ 105,000
Environmental Planning		$ 62,000
Environmental Permitting and CEQA		$ 14,000
GIS and Surveying		$ 10,000
Outreach		$ 10,300
Zone Meeting and Board of Supervisors Admin		$ 26,000
QA/QC and Strategy		$ 103,000
Engineering and Real Estate		$ 80,000
Flapgate Maintenance and Storm Response		$ 47,000
County Special Cost Allocation		$ 90,000
Salaries, Benefits, and Overhead	**441,928**	**$ 917,300**
Utilities	15,513	$ 16,000
Rent (Storage and Space)	2,184	$ 2,200
Association Dues and Memberships	2,810	$ 4,200
Maintenance & Repair Services - Equipment		
Cardinal Pump Station Pump #1	24,581	$ 30,900
Cardinal Pump Station Pump #2		
Crest Marin Pump Station Pump #1		
Crest Marin Pump Station Pump #2		
Crest Marin Pump Station Pump #3		
Crest Marin Pump Station Pump #4		
Ryan Creek Pump Station Pump #1		
Ryan Creek Pump Station Pump #2	32,441	$ 33,940
Seminary Drive Pump Station Pump #1		
Seminary Drive Pump Station Pump #2		
Shoreline Pump Station Pump #1		
Shoreline Pump Station Pump #2		
Shoreline Pump Station Pump #4		
Precipitation & Stream Gauge, Alert & Camera System	11,773	$ 15,000
Clean/Ream and Inspect 54 Pipes at Coyote Creek*		$ 60,000
Other (incl. Miltronics for Seminary)	29,105	$ 50,000
M&R-Equip	**118,407**	**$ 189,840**
Maintenance & Repair Services - Land		
District Vegetation/Sediment Maintenance	49,991	$ 83,327
Mill Valley Vegetation/Sediment Maintenance (grant)	30,577	$ 115,000
Other (Includes Tree/Fence Repair)	9,762	$ 51,500
Coyote Creek Levee		
Rodent Abatement	7,500	$ 15,000
Tennessee Valley Pathway Wetlands Restoration		
Remove Unauthorized Coyote Levee Encroachments*		
M&R-Land	**97,830**	**$ 579,667**
Professional Services		
Study Contingency	32,536	$ 75,000
Marin City Drainage Study***	92,310	$ 220,000
Mill Valley Studies (grant)	13,763	$ 320,000
Website Update		$ 8,000
Coyote Creek Levee		
Incorporate Changes to Coyote Creek into Project*		
Coyote Creek Survey And Hydraulic Study		
Nyhan Creek Flood Study		
Finalize Coyote Creek O&M Manual Update*		
Construction		
Coyote Creek Sediment Removal		
Mill Valley Projects (grant)	381,249	$ 650,000
Rehabilitate/CCTV Penetrating Pipes*	10,500	$ 30,000
Abandon Penetrating Pipes*		
Install Tide Gage on Coyote Creek		
Construction Contingency	92,461	$ 100,000
Supplies		
Muscle Wall		
Other (Misc. creek, levee, and pump supplies)		$ 70,000
Service and Supplies	**839,056**	**$ 2,264,907**
Total Expenditures	**1,280,984**	**$ 3,182,207**
Revenues (increase approx. 0.5% annually)	2119905***	$1,817,841
Fund Ending Balance*		$ 6,933,299

[1]Labor Charges reflect the first 3 quarters of the fiscal year;
Expense charges reflect charges booked through April 30, 2017

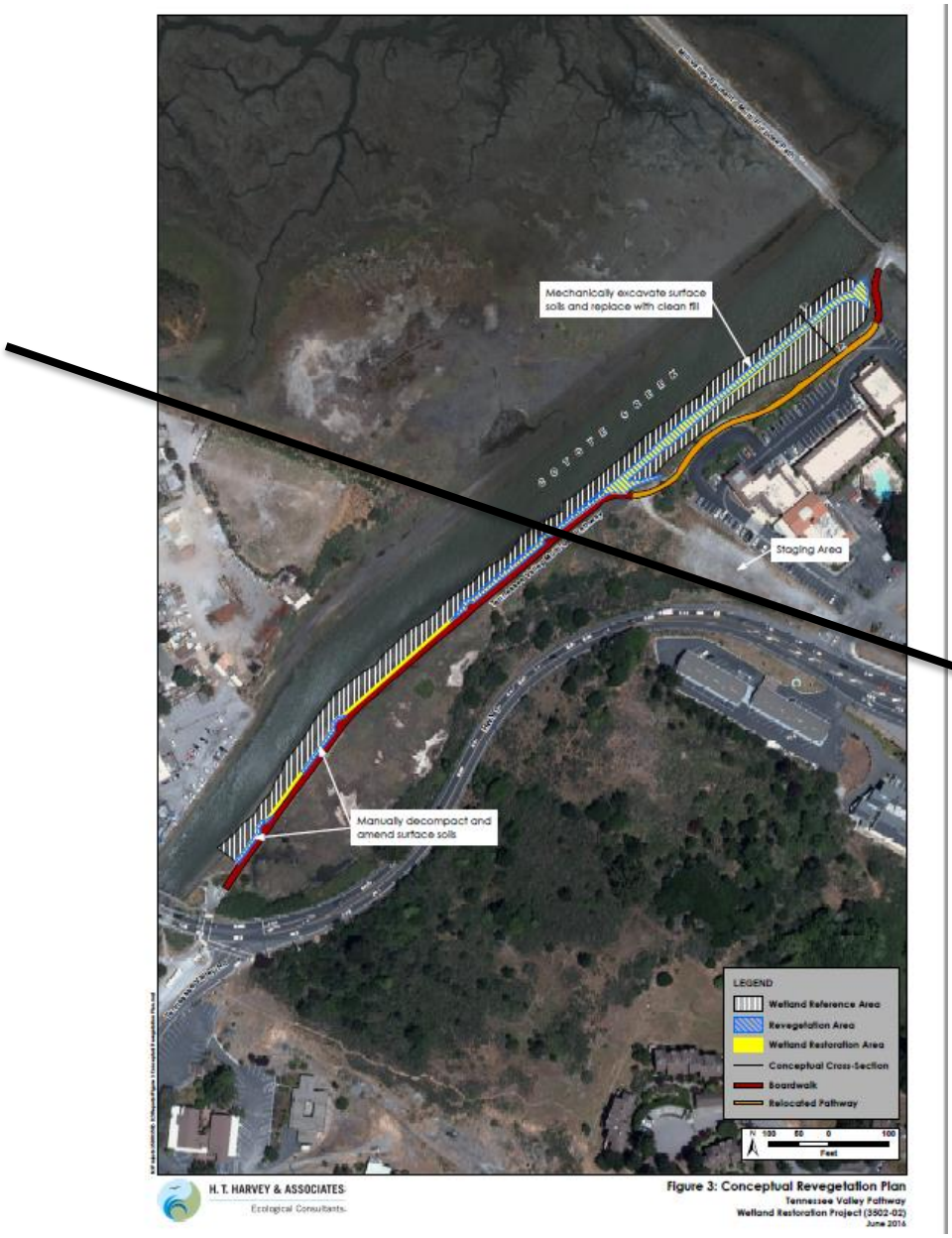
***** 2016 YTD Revenues include $313,398 in one-time grant funds**
Tax revenues: $2,119,905 - 313,398 = $1,806, 507

Tennessee Valley Pathway Restoration Project

Jurisdictional Boundaries



Coyote Creek – Lower Reach: Red Lined Area = District Fee Title



County of Marin

District

Restoration Project Plan View

Tennesse Valley Pathway
Wetlands Restoration Project

Cost-Allocation Breakdown

Project Total Soil Work 354 cubic yards (cy)

County Property Portion 296 cy

	90	feet		550	feet
x	5	feet	x	12	feet
x	8	inches	x	14	inches
	11	cy		285	cy

District Property Portion 58 cy

	470	feet
x	5	feet
x	8	inches
	58	cy

Raw Cost Allocation

County Property Portion
296/354 84%

District Property Portion
58/354 16%

Adjusted Cost Allocation

District Property Portion has increased labor costs due to hand work. Adjust by 100%.

Adjusted District Property Cost Allocation = 32%

Adjusted County Property Cost Allocation = 68%

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Memorandum

August 26, 2016

To: Bene Da Silva
Engineering Assistant
Marin County Flood Control and Water Conservation District

From: Gavin Archbald, M.S.
Project Manager, Senior Restoration Ecologist

Subject: **Tennessee Valley Pathway Wetland Restoration Project**
Rough Order of Magnitude Cost Estimate

H. T. Harvey & Associates prepared the *Tennessee Valley Pathway Wetland Restoration Project's Conceptual Restoration Plan* (Conceptual Restoration Plan, dated June 16, 2016) for the Marin County Flood Control and Conservation District (District). This memorandum provides a rough, order-of-magnitude cost estimate for implementation of the Conceptual Restoration Plan.

PRIMARY COST ESTIMATE ASSUMPTIONS

This rough order of magnitude cost estimate was prepared using the following major assumptions:

- This cost estimate is based on the Conceptual Restoration Plan. Additional design/construction documentation would be necessary to refine this cost estimate. Therefore, this rough order of magnitude cost estimate incorporates a 30% contingency.
- Construction will be performed by a qualified restoration contractor.
- No hazardous materials are present within the footprint of earthwork.
- All excavated material would be disposed off-site at a non-hazardous waste landfill.
- The project will be constructed in a single construction season. The contractor will be given the notice to proceed in time to start construction as soon as the California Ridgway's rail breeding season ends on August 31, to maximize the window for earthwork prior to the rainy season.
- Temporary salt marsh harvest mouse exclusion fencing and the level of effort for associated biological construction monitoring will conform to the measures in the Tennessee Valley Pathway Project's Letter of Concurrence from the U. S. Fish and Wildlife Service (dated July 22, 2009).
- Additional long-term ecological monitoring beyond the current permitted 5 year plan, is not included. The regulatory agencies will likely require additional years of monitoring, beyond Year 5 (2017), but the duration of extended monitoring will not be known until the County negotiates with the agencies.
- County soft costs and any access costs/fees, if needed, have not been included.

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Opinion of Rough Order of Magnitude Costs

Project: Tennessee Valley Pathway Wetland Restoration Project

Project Number: 3502-02

Location: Mill Valley, CA

Client: Marin County Flood Control and Water Conservation District

Phase: Conceptual

Date / prepared by: 24 August 2016 / JU, JMH, MB

Item	Quantity	Unit	Unit Cost	Cost
DESIGN AND BIOLOGICAL CONSULTING (SOFT COSTS)	1	LS	$ 61,000.00	$ 61,000.00
Sub-total				**$ 61,000.00**
MOBILIZATION	1	LS	$ 14,400.00	$ 14,400.00
Sub-total				**$ 14,400.00**
TEMPORARY FENCING	1	LS	$ 24,500.00	$ 24,500.00
Sub-total				**$ 24,500.00**
EARTHWORK	1	LS	$ 78,400.00	$ 78,400.00
Sub-total				**$ 78,400.00**
PLANTING	1	LS	$ 25,600.00	$ 25,600.00
Sub-total				**$ 25,600.00**
MAINTENANCE (2 Years)	1	LS	$ 15,000.00	$ 15,000.00
Sub-total				**$ 15,000.00**
			SUB-TOTAL	**$ 218,900.00**
			CONTINGENCY (30%)	**$ 65,670.00**
			TOTAL	**$ 284,570.00**

This opinion reflects probable construction costs obtainable for the project location on the date of this estimate. Due to the fluctuation of labor, material and equipment costs and the nature of the competitive environment at the time of bid, prices may vary.

San Francisco Bay Office
983 University Avenue, Bldg. D
Los Gatos, CA 95032
408.458.3200

H. T. HARVEY & ASSOCIATES

Ecological Consultants

Tennessee Valley Pathway Wetland Restoration Project: Conceptual Restoration Plan

Project #3502-02

Prepared for:

Bene Da Silva
Marin County Flood Control and Water Conservation District
3501 Civic Center Drive, Suite 304
San Rafael, CA 94903

Prepared by:

H. T. Harvey & Associates

June 16, 2016

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Tables

Appendices

List of Preparers

Max Busnardo, M.S., Principal, Senior Restoration Ecologist
Joe Howard, M.L.A., Senior Landscape Architect
Gavin Archbald, M.S., Project Manager, Senior Restoration Ecologist
Patrick Furtado, M.S., Restoration Ecologist

Section 1. Introduction

1.1 Permit Numbers

This conceptual restoration plan was produced to comply with the permits issued by the U.S. Army Corps of Engineers (USACE), the Regional Water Quality Control Board (RWQCB), the Bay Conservation and Development Commission (BCDC), and the United States Department of Fish and Wildlife (USFWS) for the Tennessee Valley Pathway Project (project) in Mill Valley, Marin County, California (Table 1).

Table 1. Project Permit Numbers

Permitting Agency Requiring Habitat Restoration	Permit Number
U. S. Army Corps of Engineers	2008-00482N
U. S. Fish and Wildlife Service	81420-2009-I-0580-1
Regional Water Quality Control Board	02-21-C735; CIWQS Place No. 733526
Bay Conservation and Development Commission	2-09

1.2 Background

The project is being implemented by the Marin County Flood Control and Water Conservation District (District) to restore and revegetate a rerouted section of the Tennessee Valley Pathway adjacent to Coyote Creek in the City of Mill Valley, California (Figure 1).

The project site is located entirely within a tidal salt marsh along the southeast side of Coyote Creek, near the creek's outlet to Richardson Bay. The site is bounded to the east and south by a hotel and Highway 1. Coyote Creek is channelized and tidal throughout the project area. The tidal salt marsh habitat is dominated by perennial pickleweed (*Salicornia pacifica*). Other common salt marsh species in this habitat include salt grass (*Distichlis spicata*), marsh jaumea (*Jaumea carnosa*), alkali heath (*Frankenia* salina), and marsh rosemary (*Limonium californicum*). The creek supports Pacific cord grass (*Spartina foliosa*) along the creek channel edge.

Improvements to the Tennessee Valley Pathway were carried out in 2012 - 2013 and included the removal of an asphalt pathway at the project site and its partial replacement by an elevated boardwalk. A section of the pathway was also re-routed through adjacent uplands. These improvements resulted in 0.27 acres (ac) of un-vegetated salt marsh along Coyote Creek in an area referred to as the Wetland Restoration Area (Figure 2).

The majority of the Wetland Restoration Area is an unvegetated area located northeast of the new boardwalk, between Coyote Creek and the relocated upland pathway (Figure 2). This unvegetated area is where the asphalt path was removed but not replaced by boardwalk and is an approximately 15 feet (ft) by 550 ft rectangular strip (Appendix C, Photo 1). The remainder of the Wetland Restoration Area consists of a narrow, patchily vegetated

strip, roughly 3 ft by 850 ft, immediately adjacent the north side of the boardwalk along the shoulder of the former at-grade pathway.

The project's resource agency permits called for monitoring to determine if natural (e.g., passive) vegetation recruitment would be adequate to restore tidal salt marsh vegetation in the Wetland Restoration Area. Permits required that native salt marsh vegetation cover within the Wetland Restoration Area reach at least 80% of the cover in an adjacent reference marsh, the Wetland Reference Area (Figure 2), five years after construction and that non-native plants comprise less than 5% absolute cover. The Wetland Reference Area is also located in the marsh along Coyote Creek, immediately adjacent to the Wetland Restoration Area, and was established by H. T. Harvey & Associates in Year-1. If natural vegetation recruitment is not sufficient to meet this goal, project permits require Marin County to initiate a plan to speed vegetation establishment (BCDC 2010).

After three years of monitoring at the site, native wetland vegetation cover was 7% in the Wetland Restoration Area and 80% in the Wetland Reference Area (H. T. Harvey & Associates 2015). This indicates that the Wetland Restoration Area is unlikely to meet the Year 5 final success criterion in the project permits without active revegetation to address the causes of low vegetation cover. The project's Year 3 monitoring report concluded that vegetation has likely established slowly in the Wetland Restoration Area because the substrate consists of compacted soils and base rock (from the previously removed asphalt path) that prevent root penetration. Furthermore, sections of the Wetland Restoration Area are lower in elevation than the surrounding marsh and remain flooded by several inches of ponded water at low tide. These conditions will continue to restrict marsh vegetation establishment in future years unless remedial action is taken to improve drainage and substrate texture (H. T. Harvey & Associates 2015).

To address these conditions, project permits and email communication with the Regional Water Quality Control Board (RWQCB) required that Marin County prepare a "Conceptual Restoration Plan" to rapidly increase native wetland vegetation cover in the Wetland Restoration Area.

This report provides H. T. Harvey & Associates' conceptual restoration plan for tidal salt marsh revegetation in the Tennessee Valley Pathway Project Wetland Restoration Area.

N:\Projects3500\3502-02\Reports\Figure 1 Vicinity Map.mxd

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 1: Vicinity Map
Tennessee Valley Pathway
Wetland Restoration Project (3502-02)
June 2016

N:\Projects\3500\3502-02\Reports\Figure 2 Existing Conditions.mxd

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 2: Existing Conditions
Tennessee Valley Pathway
Wetland Restoration Project (3502-02)
June 2016

Section 2. Methods to Identify Restoration Opportunities and Constraints

H. T. Harvey & Associates restoration ecologists G. Archbald and P. Furtado conducted a field assessment on April 22, 2016 to identify restoration opportunities and constraints to develop the conceptual restoration plan.

2.1 Field Assessment

The ecologists conducted soil and elevation surveys within the Wetland Restoration and Reference Areas and visually examined areas where marsh vegetation had passively re-established in the Wetland Restoration Area. The purpose of the soil survey was to determine whether soils could be amended in place to improve soil conditions or whether soil would need to be replaced. Elevation surveys were carried out to determine whether additional fill or other methods to improve drainage would be necessary to reduce ponding in the Wetland Restoration Area. Vegetation cover was qualitatively observed throughout the site to determine the portions of the Wetland Restoration Area that lack vegetation and where natural recruitment has been sufficient to restore vegetation in the pathway.

Site elevations were measured using a Topcon laser level relative to a local benchmark established for the survey. One longitudinal elevation survey was completed along with five cross-sectional surveys to compare elevations in the Wetland Restoration Area and the Wetland Reference Area (Figure 2). Elevations were measured every 20 ft along the longitudinal transect and every 3 ft along the 5 cross-section transects. During the elevation surveys, the ecologists recorded the approximate elevation where the tidal salt marsh vegetation begins to transition into an upland vegetation (i.e., the upland transition zone). This elevation was recorded because it represents the highest elevation the marsh could be filled during revegetation without converting wetlands to uplands and therefore represents a useful elevation analog for considering grading options.

To assess the horticultural suitability of Wetland Restoration Area surface soils, the ecologists dug nine soil pits to depths between 12 and 18 inches through the Wetland Restoration Area and visually examined the following soil characteristics: soil texture and color, soil compaction, and rock and gravel depths. The locations of the soil pits are shown in Figure 2. In addition, a single composite soil sample was collected representing the 9 soil pits and sent to Waypoint Analytical (San Jose, CA) for analysis for horticultural parameters (texture, pH, percent organic matter, electrical conductivity, and nutrient concentrations). A single composite sample was sufficient because soil properties (e.g., texture, color, level of compaction) appeared consistent across the 9 soil pits, suggesting there was little variability in soil horticultural suitability among planting pits.

Finally, the ecologists mapped all vegetated areas of the Wetland Restoration Area to determine which areas do and do not require revegetation. Revegetation was considered unnecessary in areas where marsh vegetation cover was qualitatively equivalent to vegetation cover in the Wetland Reference Area.

Section 3. Existing Conditions and Opportunities for Enhancement

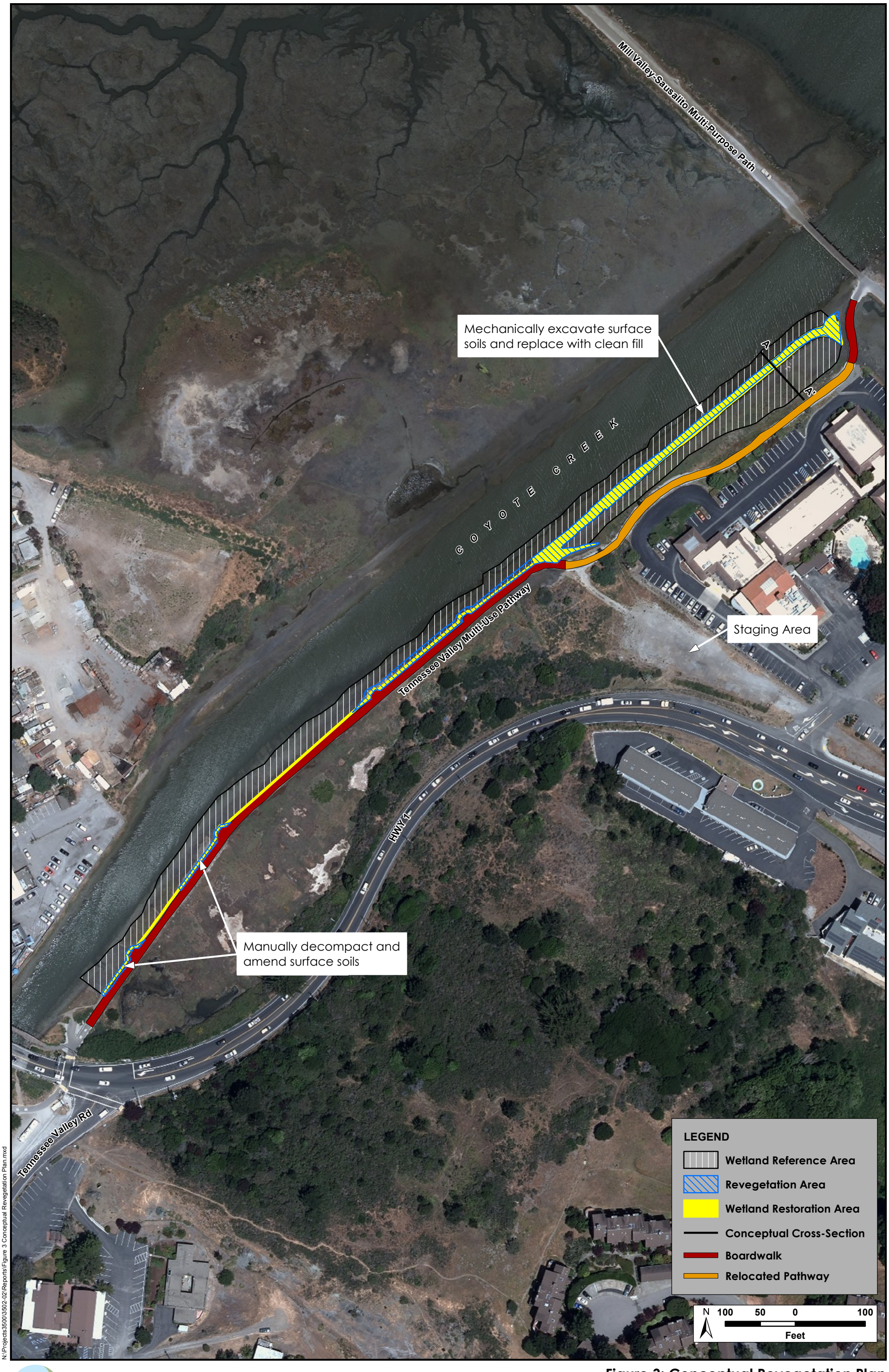
The site assessment found that the majority of the Wetland Restoration Area requires revegetation because it consists of unvegetated areas where poor drainage and compacted soils have created conditions unsuitable for natural recruitment. The portion of the Wetland Restoration Area requiring revegetation is shown as the "Revegetation Area" in Figure 3. The main area requiring revegetation is a barren strip approximately 12 feet wide by 550 feet long (approximately 0.15 acre) located to the northeast of the newly constructed boardwalk (Figure 3). This is the location where the asphalt path was removed and rerouted through the adjacent upland area. Several narrower unvegetated sections of the Wetland Restoration Area, located adjacent to the boardwalk (along the shoulder of the former pathway), were also barren and require revegetation (Figure 3). These smaller patches are each approximately 5 feet wide with a combined length of approximately 560 feet (in total, approximately 0.06 acre) (Appendix C, Photo 3). The total extent of the revegetation area identified in the survey was approximately 0.21 acres. By contrast, portions of the linear strip of Wetland Restoration Area outside of the revegetation area on Figure 3, adjacent to the boardwalk, revegetated passively and do not warrant revegetation action (Appendix C, Photo 2).

Elevation surveys confirmed that the main area of the unvegetated former pathway is a ponded feature for approximately 60% of its length; ponded by salt water brought in by high tides. A longitudinal survey of this strip found that elevations were, on average, 6 inches below the adjacent vegetated marsh plain (the Wetland Reference Area) (Appendix A). This linear depression, along with the compacted soils, explains the ponding of water along this former pathway. The depth of the ponded water ranged from 0.5 to 6 inches. The deepest ponding occurred in the northern half of this strip where pathway elevations were up to 11 inches lower than the surrounding marsh plain (Appendix A; Appendix C, Photo 1). This section will require more fill to bring the elevation up to marsh plain grades.

All nine soil pits were dug into very tightly compacted soils composed primarily of gravel and rock (Appendix B). The rock and gravel in the soils is uncharacteristic of marsh sediments and is likely remnant base rock originally placed for construction of the former asphalt pathway and left in place following pathway removal. The depth of the gravel and rock layer was on average 14 inches, and varied from 7 to 16 inches in depth (Appendix D). Rocks were sharply angular and up to 5 inches in diameter (Appendix C, Photo 4). Clay soils characteristic of native tidal marsh sediment were found beneath the gravel and rock layer. The soil analysis conducted by Waypoint Analytical classified the soil as very gravelly sandy clay loam. Complete horticultural analysis results are provided in Appendix B.

The rocky and compacted soils in the revegetation area are not suitable for marsh vegetation growth because insufficient pore space is available in the rocky soils for root establishment. Tidal salt marsh vegetation typically establishes in fine sediments (e.g., clay and silt particle sizes) with relatively high organic matter (e.g., greater than 5% by dry weight). The Waypoint analysis, by contrast, found little soil organic matter, approximately 1%

by dry weight. Soil organic matter is essential for nutrient cycling and pore water retention in marsh soils. These results suggest that some improvement in soils may be possible through decompaction and amendment of gravel soils, however, establishment of dense, healthy marsh vegetation requires replacement of the gravel-dominated fraction of soil with suitably textured soil within the rooting zone of native salt marsh vegetation.



N:\Projects3500\3502-02\Reports\Figure 3 Conceptual Revegetation Plan.mxd

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 3: Conceptual Revegetation Plan
Tennessee Valley Pathway
Wetland Restoration Project (3502-02)
June 2016

Section 4. Conceptual Restoration Plan

4.1 Basis of Design

The above investigation found that the cause of poor natural marsh vegetation recruitment is due to the presence of compacted baserock from the former trail combined with a topographic depression with poor drainage. The compacted baserock limits water and root penetration and the depression, combined with compacted soils, causes prolonged inundation and associated anaerobic and/or salt stress to seedlings. We also found that the majority of the site (the northeastern area where the former trail was relocated to uplands) is feasibly accessible by heavy equipment from an adjacent staging area and is wide enough to adequately minimize temporary impacts to adjacent salt marsh habitat. Therefore, unsuitable soil will be mechanically removed and replaced with soil suitable for target plant growth throughout the majority of the revegetation area (Figure 3). This approach has the highest certainty of creating conditions suitable for rapid establishment of native tidal salt marsh vegetation (Figure 3). In the two small revegetation areas at the southwest end of the pathway, heavy equipment access for soil replacement would require substantial additional impacts to adjacent vegetated marsh. Moreover, these areas represent a small fraction of the Wetland Restoration Area (0.1%). Therefore, the surface soil in these two areas will be manually decompacted and amended with composted organic matter. (Figure 3).

We expect that the dominant native tidal marsh plant species will naturally recruit to the revegetation area once the soils are restored. However, this process could take roughly 4-10 years to reach the percent cover success criteria. Therefore, the entire revegetation area will be densely planted with native tidal salt marsh species to accelerate vegetation establishment and shorten the monitoring duration necessary to document achievement of the success criteria.

Following these improvements, the revegetation area will be approximately at the same elevation as the surrounding Wetland Reference Area, with substantial ponding eliminated, and eventually covered in dense pickleweed-dominated salt marsh vegetation. Replacement with suitable soil will allow for full recovery of marsh vegetation. In areas where soils are manually decompacted, amended, and planted, marsh vegetation is also expected to establish at a suitable level to meet the project's vegetation success criteria for the Wetland Restoration Area.

4.2 Grading and Soil Preparation

Two different restoration methods will be applied to the revegetation area, as introduced in the basis of design section above:

Excavate Soils and Replace with Clean Fill. The main portion of the revegetation area is contiguous and located in the northeast portion of the site (the areas is 0.24 ac in size and shown in Figure 3). Soils in this area will be excavated and replaced with clean fill, with horticultural characteristics suitable for native salt marsh

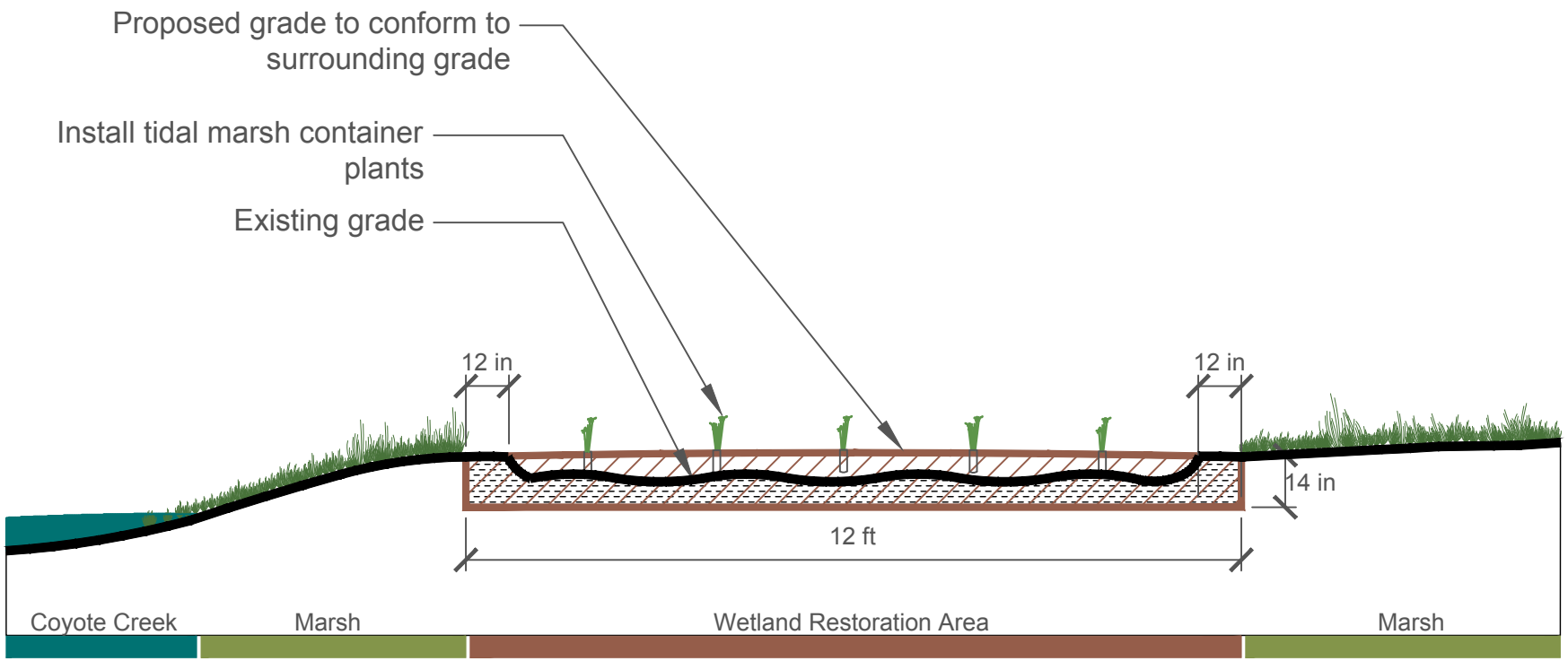
vegetation. The equipment access route to this section of the revegetation area is immediately adjacent to a staging area used previously by the project and minimal temporary impacts to marsh vegetation are required to access the revegetation area. Therefore, mechanized construction equipment (e.g., a low ground pressure excavator, and dump truck) can be utilized to remove and replace soils in this area. To mechanically remove and replace soils adjacent to the northernmost boardwalk patch, we estimate that an approximately 8 ft wide area, from the boardwalk extending into the adjacent Wetland Reference Area, will be required. Therefore, soil replacement in this area will require a small surface area of temporary impact (approx. 0.04 ac) to the existing degraded salt marsh vegetation in the Wetland Reference Area adjacent to the Wetland Restoration Area (Figure 3). Under the existing conditions, soils in this portion of the Wetland Reference Area are rocky and compacted (because it was likely the shoulder of the former trail) and support sparse marsh vegetation (e.g., Appendix C, Photo 3). Therefore, soils in this temporary impact area be replaced with suitable soil and revegetated along with the main revegetation area to both allow for heavy equipment access and to restore high quality tidal salt marsh habitat.

Compacted and rocky soils will be excavated to the depth of the underlying marsh clay (approx. 14 in, on average). This will promote drainage and allow for deeper root development of marsh vegetation. Following removal of the compacted soils, terrestrial fill or dried dredge material, will be placed in the excavated footprint, to an elevation slightly (e.g., approximately 1 inch) above the adjacent Wetland Reference Area marsh elevation to allow for settlement while retaining positive drainage. Figure 4 provides a conceptual cross-sectional view of the excavation area. During placement, soils will be compacted to approximately 85% relative compaction so that final elevation remains equal to the adjacent marsh after placement. This will eliminate future ponding of tidal waters and allow for successful replanting and establishment of nursery-grown native salt marsh species, in particular, perennial pickleweed (Figures 3). Imported fill must meet the horticultural specifications provided in Table 2 and the RWQCB's contaminant guidelines for wetland creation (RWQCB 2000).

Manually Decompact and Amend Soil. The soils of the two boardwalk patches at the southern end of the site will be manually decompacted in situ and amended with organic material (the two patches total 0.02 ac in size and are shown in Figure 3). Accessing these areas with mechanized equipment would impact a relatively large section of adjacent, existing salt marsh vegetation. This impact is unwarranted given the small size of the patches. Therefore, compacted soils will be manually decompacted down to the depth of the clay soil horizon, free of rock and gravel (approx. 8 inches in this area). Soils will be decompacted using hand crews with pick axes or similar tools. A composted organic amendment will be added to the upper 6 inches of the decompacted soils to comprise approximately 5% dry weight of the amended soil. The addition of organic matter will improve soil structure, drainage, and increase pore space for root development of marsh vegetation.

Table 2. Range of Soil Properties for Clean Imported Fill for Path Revegetation Installation

Constituent	Test Method	Minimum	Maximum
clay (0 – 0.002 mm)	USDA round hole sieves and hydrometer procedures	25%	80% by volume
silt (0.002 – 0.05 mm)		10%	60% by volume
sand (0.05 – 2.0 mm)		10%	50% by volume
gravel (2-12 mm)		0%	10% by weight
rock (up to 1 inch diameter)		0%	10% by weight
organic matter (by weight of soil)	Dichromate reduction using the Walkley Black Method	5%	10%
pH	Soil paste method and pH meter	6.5	8.0
Calcium: magnesium ratio	1N sodium chloride extract and measure via atomic absorption	1:1	NA
salinity	Saturation extract method using Wheatstone Bridge	0	35 dS/M @ 25 degrees C
Sodium Adsorption Ratio	Calculate from soil extract values for calcium, magnesium, and sodium	0	15
boron	Saturation extract method using ICP	NA	< 2 ppm



Legend

Import clean fill

Remove unsuitable existing fill

Note: Drawing not to scale and all measurements are approximate.

H.T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 4: Conceptual Cross Section
Tennessee Valley Pathway Wetland Restoration Project (3502-02)
June 2016

4.3 Conceptual Planting Plan

After the restoration areas are graded or amended, the areas will be planted with suitable salt marsh plant species (Table 3; Figure 4). The plant palette species selected are those found in the Wetland Reference Area and are typical of tidal salt marsh habitats. These species are generally well-adapted to saline, clay soils typical of most tidal marshes in San Francisco Bay. Container plants will be installed to promote rapid vegetation establishment. Plant materials will be purchased from a qualified plant nursery and collected from source populations located in the Richardson Bay watershed. An 8-12 month lead time prior to plant installation is typically necessary to contract grow the plants.

The spacing requirements between plants are specified in the plant palette table below. Plants will be installed between November 1 and January 31, during the rainy season. Plants will be installed after soils are wetted to field capacity by winter rains.

Table 3. Conceptual Planting Palette

Scientific Name	Common Name	On-center Spacing (ft)	Percent Composition	Approximate Plant Quantities*
Distichlis spicata	saltgrass	2	15	470
Frankenia salina	alkali heath	2	15	470
Jaumea carnosa	marsh jaumea	2	10	313
Salicornia pacifica	perennial pickleweed	2	60	1879
		Total	**100**	**3132**

*Plant quantities based on triangular spacing

4.4 Avoidance and Minimization Measures

Prior to the initiation of construction work in the Wetland Restoration Area, a qualified biologist will delineate the work boundaries with lath and flagging. An exclusion fence for salt marsh harvest mouse will be installed around the work boundaries as specified in the project's Biological Opinion (USFWS 2009). The areas outside of the exclusion fencing will be off limits to construction activities and personnel at all times during work activities. The fence will be maintained as needed and remain in place throughout the work period.

The biologist will work with the contractor to reduce and minimize the impacts on the vegetated pickleweed marsh, adjacent to the areas to be excavated and decompacted. No vehicles or heavy equipment will be permitted on existing marsh vegetation adjacent to the portion of the revegetation area designated for mechanical excavation and soil replacement. If existing vegetated areas of the marsh need to be accessed by workers during construction, protective materials such as plywood sheets (or equivalent) will be temporarily installed (for a maximum of 2-3 days) to completely cover all vegetated marsh areas, including the access pathways to construction sites and vegetation immediately surrounding the excavation areas. The restoration

area at the southwest end of the boardwalk will use hand crews and wheel barrows and no heavy equipment. No permanent impacts to marsh habitat are expected from restoration construction.

The restoration project outlined in this conceptual plan will follow all avoidance and minimization measures in the permits issued for the Tennessee Valley/Manzanita Connector Pathway Project by USACE, USFWS, RWQCB, and BCDC (Table 1) including the following measures:

- All project construction and habitat restoration work activities will be performed between September 1 and January 31 of any given year.
- An exclusion fence for salt marsh harvest mouse will be installed around the work boundaries. The areas outside of the exclusion fencing will be off limits to construction activities and personnel at all times during work activities. The fence will be maintained as needed and remain in place throughout the work period
- A qualified biologist approved by the Service will be present onsite to monitor for Ridgway's rails (*Rallus obsoletus obsoletus*) and salt marsh harvest mice (*Reithrodontomys raviventris*) during all work activities. The biological monitor's duties and authority are further outlined in the USFWS permit.
- Prior to the initiation of work, the biological monitor will conduct an environmental training session for all construction personnel.
- The number of access routes, size of staging areas, and total area of the work activities will be limited to the minimum necessary to achieve the project goal.

Section 5. Monitoring and Annual Reporting

Once approved by all permitting agencies, it is anticipated that all restoration work outlined in this conceptual restoration plan will be conducted in the fall/winter of 2017/2018. This schedule will allow ample time both for agency approval of this conceptual plan and for Marin County to contract grow the plants in a native plant nursery (typically 8-12 months), prepare construction bid documents, and retain a qualified restoration contractor. Moreover, we do not anticipate any substantial increases in vegetation cover prior to restoration construction. Therefore, we propose that the annual mitigation monitoring and reporting cease until after restoration construction. Monitoring of the restoration areas would then commence at the end of the growing season after construction is completed (in late summer 2018). All restoration monitoring will follow the methods developed and outlined in the Year-1 Tennessee Valley Pathway Project Wetland Restoration Monitoring Report (H. T. Harvey & Associates 2013).

5.1 Biological As-Built Report

A qualified restoration ecologist will monitor implementation of the restoration plan to document any significant deviations between the constructed condition and the conceptual plan presented herein. Observations will be summarized in a biological as-built report and submitted to the project permitting agencies within 60 days of completion of construction.

5.2 Final Success Criteria

Project permits call for vegetation monitoring to determine whether sufficient marsh cover establishes in the restoration area to meet the quantitative vegetation success criteria (Table 4). Permits require that native salt marsh vegetation cover within the Wetland Restoration Area reach at least 80% of the cover in the adjacent Wetland Reference Area, five years after construction, and that non-native plants comprise less than 5% absolute cover.

5.3 Annual Report

An Annual Monitoring Report will be submitted to the permitting agencies by October 31 following each monitoring year after restoration construction until the final success criteria are met or permitting agencies agree that monitoring may cease. Monitoring Reports will present the findings of the annual field surveys relative to the performance standards in the monitoring plan described above. Monitoring Reports will include the following elements:

- Introduction
- Methods
- Results and Discussion - A summary of findings relative to performance standards
- Management Recommendations - Corrective measures (if needed)

Section 6. References

Baldwin B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. The Jepson Manual: Vascular Plants of California, Second Edition. University of California Press, Berkeley.

[BCDC] Bay Conservation and Development Commission. Marin County Parks & Open Space Tennessee Valley Pathway Project. Permit No. 2-09. February 11, 2010.

Bonham, C. D. 1989. Measurements for Terrestrial Vegetation. John Wiley & Sons, New York, NY.

[RWQCB] Regional Water Quality Control Board. 2000. Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines. Draft staff report. May.

[RWQCB] California Regional Water Quality Control Board San Francisco Bay Region. 2009. Site Number 02-21-C735/ CIWQS Place No. 733526 to Marin County Department of Public Works. 17 December 2009.

[H. T. Harvey & Associates] H. T. Harvey & Associates. 2013. Marin County Parks & Open Space Tennessee Valley Pathway Project Wetland Restoration Monitoring Report Year-1 (2013). Submitted to Elise Holland, September 2013. Project #3502-01

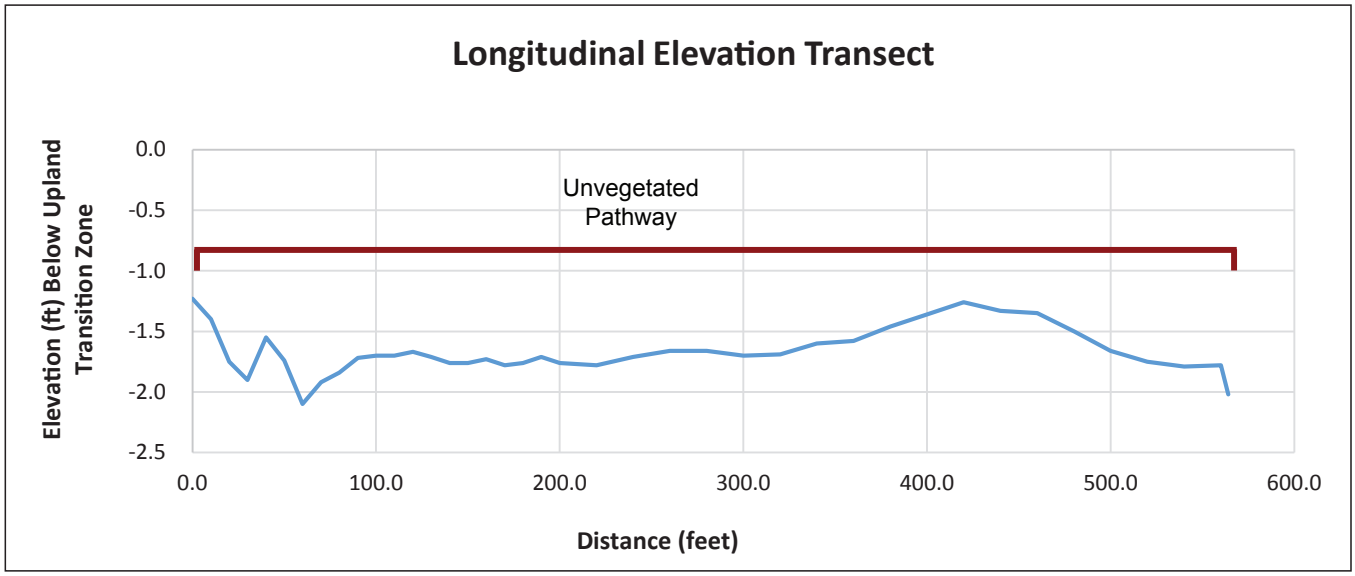
[H. T. Harvey & Associates] H. T. Harvey & Associates. 2014. Tennessee Valley Pathway Project Wetland Restoration Monitoring- Year-2 Monitoring Report (2014). Submitted to James Raives, Marin County Parks & Open Space. 17 October 2014. Project # 3502-01

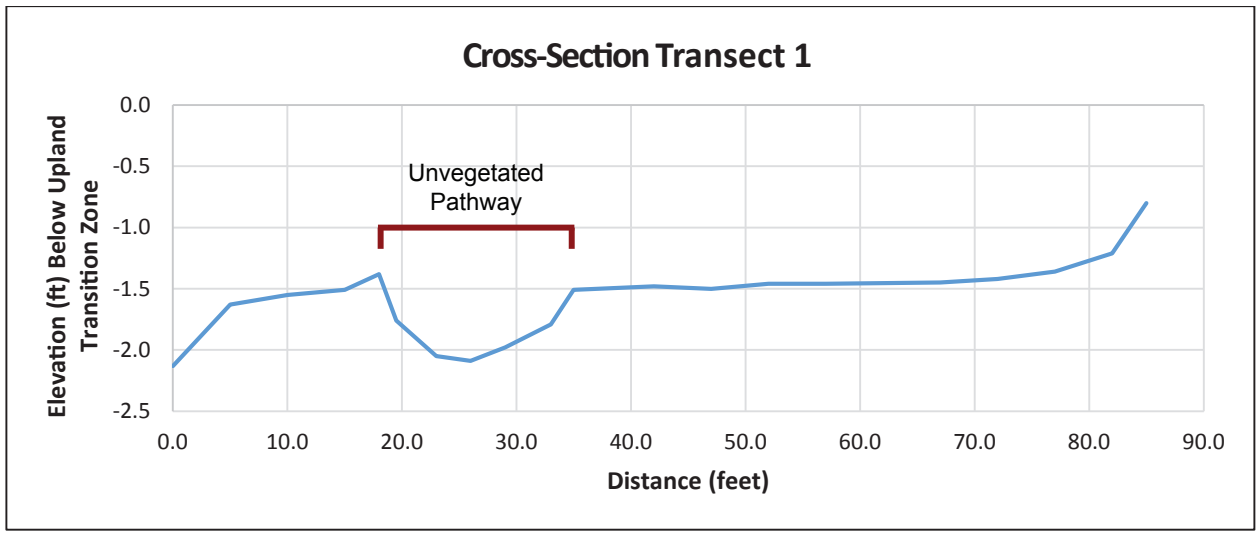
[H. T. Harvey & Associates] H. T. Harvey & Associates. 2015. Tennessee Valley Pathway Project Wetland Restoration Monitoring- Year-3 Monitoring Report (2015). Submitted to James Raives, Marin County Parks & Open Space. 16 December 2015. Project # 3502-01

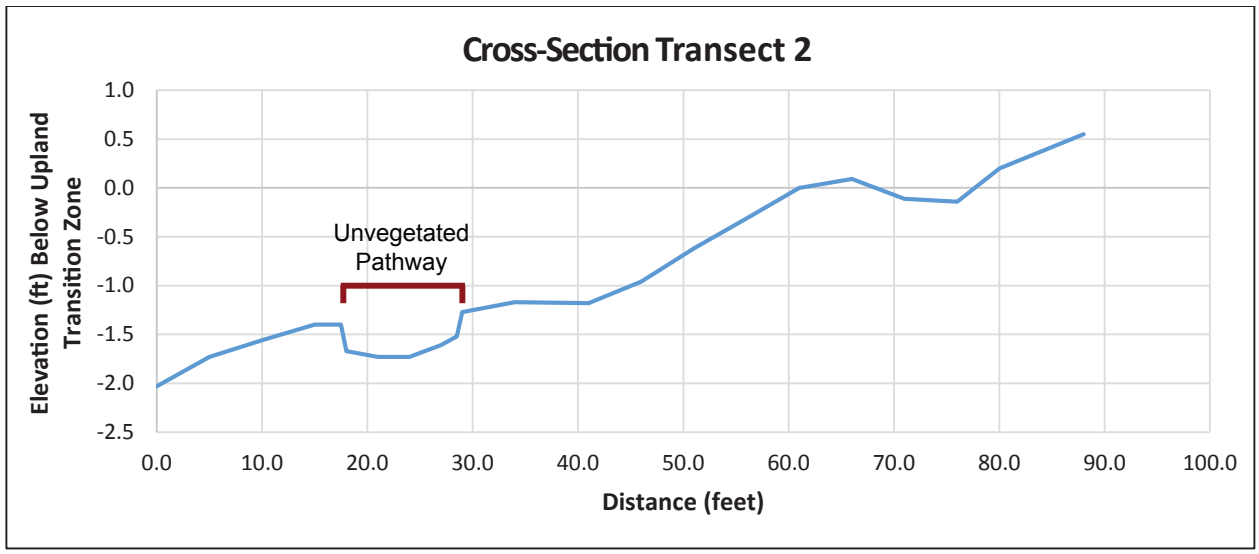
[USACE] United States Army Corps of Engineers. 2009. File Number 2008-00482N to Marin County Department of Public Works. 25 August 2009.

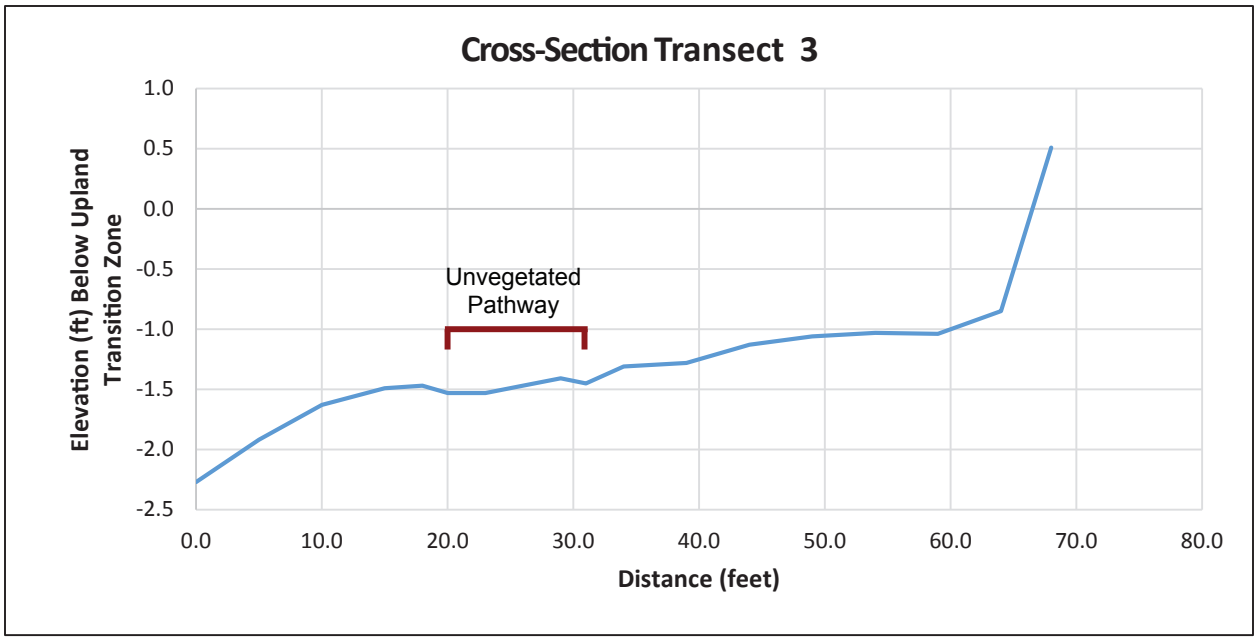
[USFWS] United States Department of the Interior Fish and Wildlife Service. 81420-2009-I-0580-1 to U.S. Army Corps of Engineers. 29 July 2009.

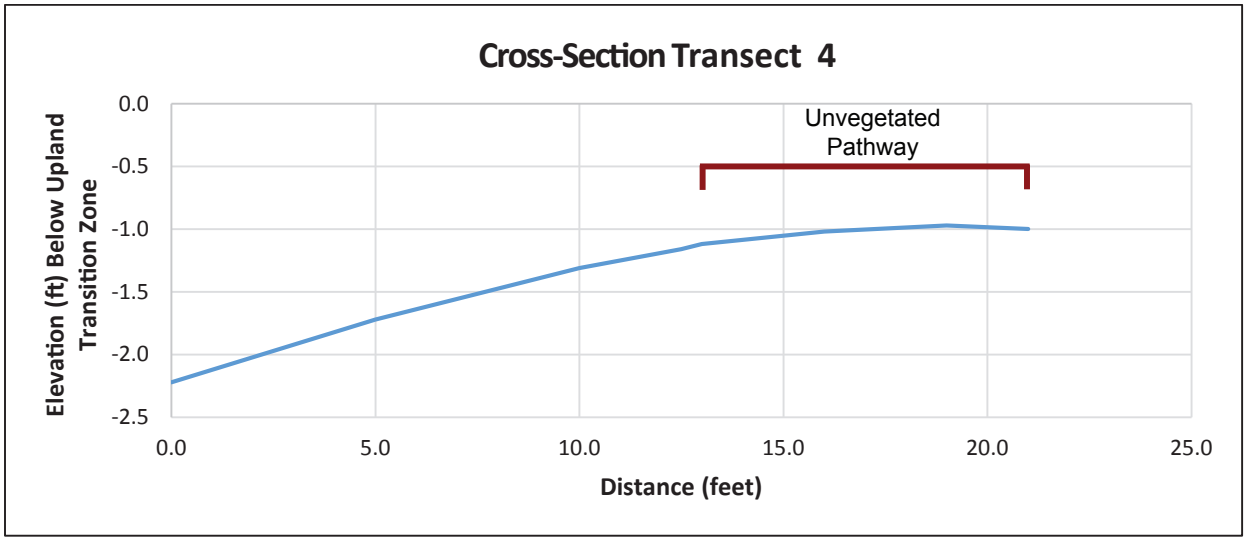
Appendix A. Elevation Survey Cross-Sections

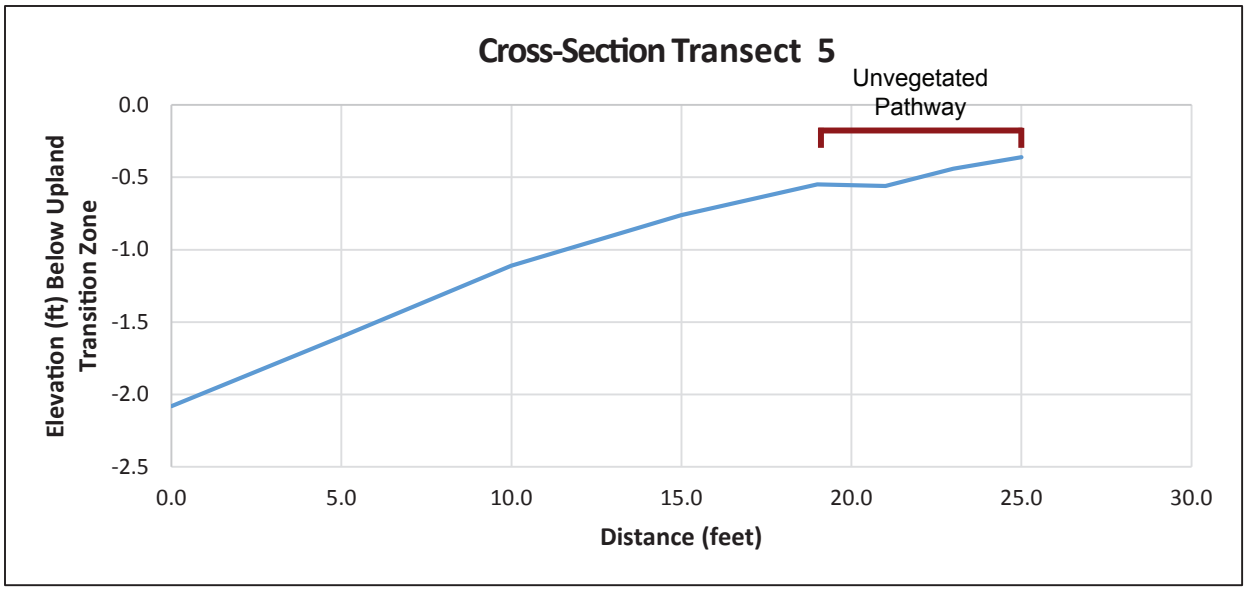

Longitudinal Elevation Transect
Elevation (ft) Below Upland Transition Zone
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Unvegetated Pathway
0.0
100.0
200.0
300.0
400.0
500.0
600.0
Distance (feet)


Cross-Section Transect 1
Elevation (ft) Below Upland Transition Zone
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Unvegetated Pathway
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
Distance (feet)


Cross-Section Transect 2
Elevation (ft) Below Upland Transition Zone
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Unvegetated Pathway
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
Distance (feet)


Cross-Section Transect 3
Elevation (ft) Below Upland Transition Zone
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Unvegetated Pathway
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
Distance (feet)


Cross-Section Transect 4
Elevation (ft) Below Upland Transition Zone
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Unvegetated Pathway
0.0
5.0
10.0
15.0
20.0
25.0
Distance (feet)


Cross-Section Transect 5
Elevation (ft) Below Upland Transition Zone
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-0.5
-1.0
-1.5
-2.0
-2.5
Unvegetated Pathway
0.0
5.0
10.0
15.0
20.0
25.0
30.0
Distance (feet)

Appendix B. Pathway Revegetation Area Soil Sample Results

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Los Gatos CA 95032

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Anaheim, CA 92807
Main 714-282-8777 º Fax 714-282-8575
www.waypointanalytical.com

Project : Tennessee Valley Pathway
Mill Valley
Job # 3502-02

COMPREHENSIVE SOIL ANALYSIS

Report No : **16-118-0101**
Purchase Order : 16-1507
Date Recd : 04/27/2016
Date Printed : 05/09/2016
Page : 1 of 1

Sample Description - Sample ID	Half Sat % / TEC	pH / Qual Lime	ECe dS/m	NO_3-N ppm	NH_4-N ppm	PO_4-P ppm	K ppm	Ca ppm	Mg ppm	Cu ppm	Zn ppm	Mn ppm	Fe ppm	Organic % dry wt.	Lab No.
	Sufficiency Factors														
Soil Sample	15	7.6	32.4	1	10	12	348	396	467	2.2	2.2	48	106	1.1	32969
	110	None		0.4		0.7	3.1	0.3	2.4	1.9	0.5	5.0	2.4		

Saturation Extract Values						SAR	Gravel %		Percent of Sample Passing 2 mm Screen					USDA Soil Classification	Lab No.
									Sand			Silt	Clay		
Ca meq/L	Mg meq/L	Na meq/L	K meq/L	B ppm	SO_4 meq/L		Coarse 5 - 12	Fine 2 - 5	Very Coarse 1 - 2	Coarse 0.5 - 1	Med. to Very Fine 0.05 - 0.5	.002-.05	0-.002		
13.1	42.1	388.0	3.0	1.77	40.6	73.9	35.5	28.0	18.8	18.2	25.7	14.7	22.5	Very Gravelly Sandy Clay Loam	32969

Sufficiency factor (1.0=sufficient for average crop) below each nutrient value. N factor based on 200 ppm constant feed. SAR = Sodium adsorption ratio. Half Saturation %=approx field moisture capacity. Nitrogen(N), Potassium(K), Calcium(Ca) and Magnesium(Mg) by sodium chloride extraction. Phosphorus(P) by sodium bicarbonate extraction. Copper(Cu), Zinc(Zn), Manganese(Mn) & Iron(Fe) by DTPA extraction. Sat. ext. method for salinity (ECe as dS/m),Boron (B), Sulfate(SO_4), Sodium(Na). Gravel fraction expressed as percent by weight of oven-dried sample passing a 12mm(1/2 inch) sieve. Particle sizes in millimeters. Organic percentage determined by Walkley-Black or Loss on Ignition.

* LOW , SUFFICIENT , HIGH

Appendix C. Photos

Photo 1. Northeastern strip of unvegetated marsh with ponded water

Photo 2. Example of the Wetland Restoration Area adjacent to boardwalk that has revegetated sufficiently and does not require active revegetation

Photo 2. Example of barren areas in the Wetland Restoration Area adjacent to boardwalk that warrants active revegetation

Photo 4. Example of compacted rocky soils excavated from soil pits

Appendix D. Soil Pit Profile Results

Soil Pit Number	Material
1	0-2” Gleyed soil, course sands and fines 2”-8” Gravels and cobbles up to 3” diameter 8”-16” Gleyed gravels and cobbles to 5” diameter 16”-18” Gleyed clay
2	0-0.5” Sand and fines 0.5”-12” Gravel and rock up to 5” diameter 12”-18” Clay
3	0-8” Gravel and rock Cobbles up to 5”diameter 8”-? Rock
4	0-16” Gravel and rock 16”-18” Clay
5	0-8” Gravel and cobble 8”+ Base rock
6	0-13” Gravel 13”-18” Clay with gravel pockets
7	0-7” Gravel and rock 7”-11” Gravel in soil matrix 11”-16” Clay
8	0-1” Clay 1”-? Gravel, rock, and cemented gravel
9	0-7” Gravel and rock 7”-18” Clay

Marin County Flood Control &
Water Conservation District

Flood Control Zone 3

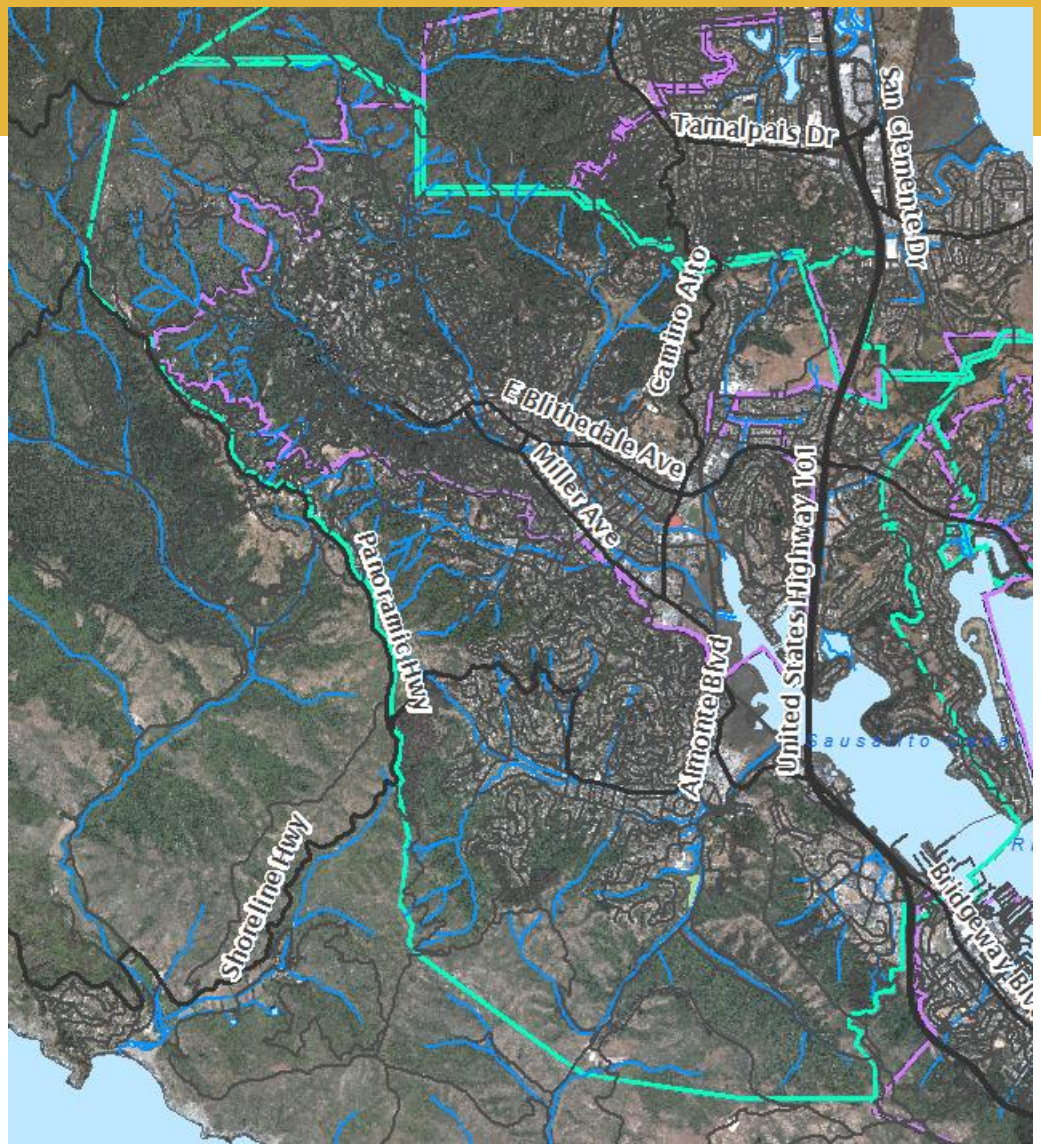
FLOOD ZONE 3 –
FEE TITLE AND EASEMENT PARCELS

MAY 25, 2017

Photo Credit: Jeff Wong

COUNTY OF MARIN

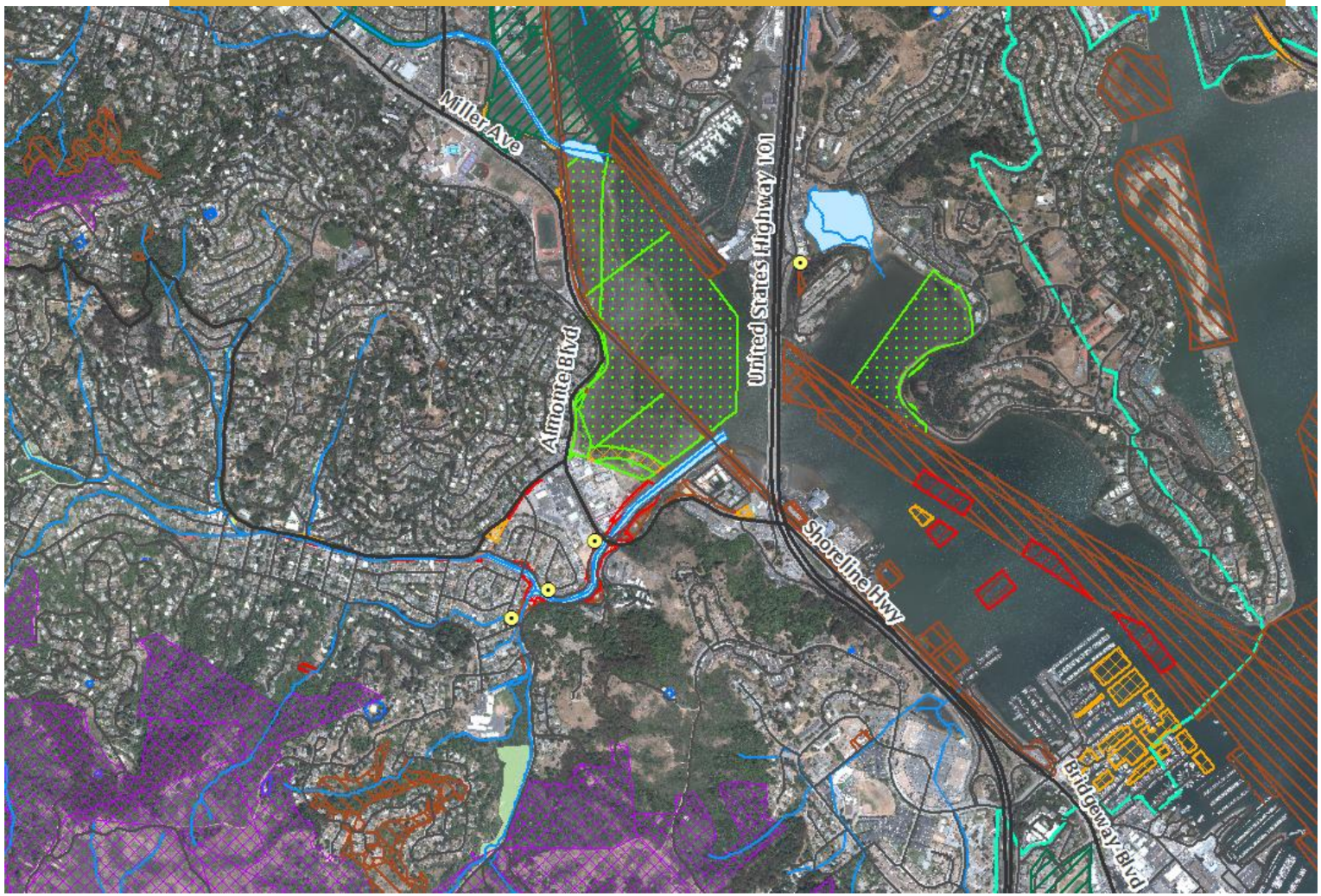
FLOOD ZONE 3 BOUNDARY



COUNTY OF MARIN

FLOOD CONTROL FEE TITLE & EASEMENTS

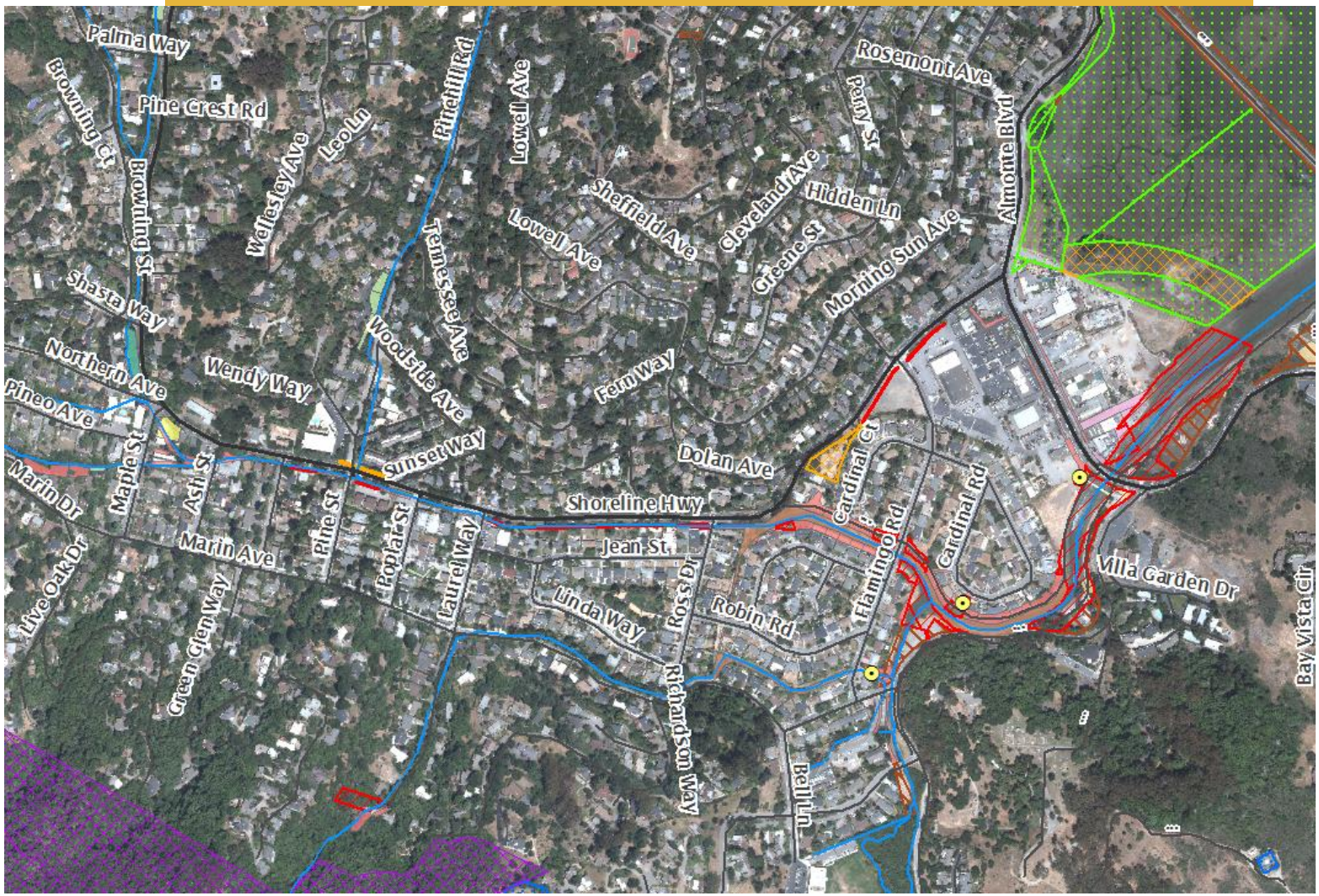
Red = Fee Title
Pink = Easement



COUNTY OF MARIN

FLOOD CONTROL FEE TITLE & EASEMENTS

Red = Fee Title
Pink = Easement



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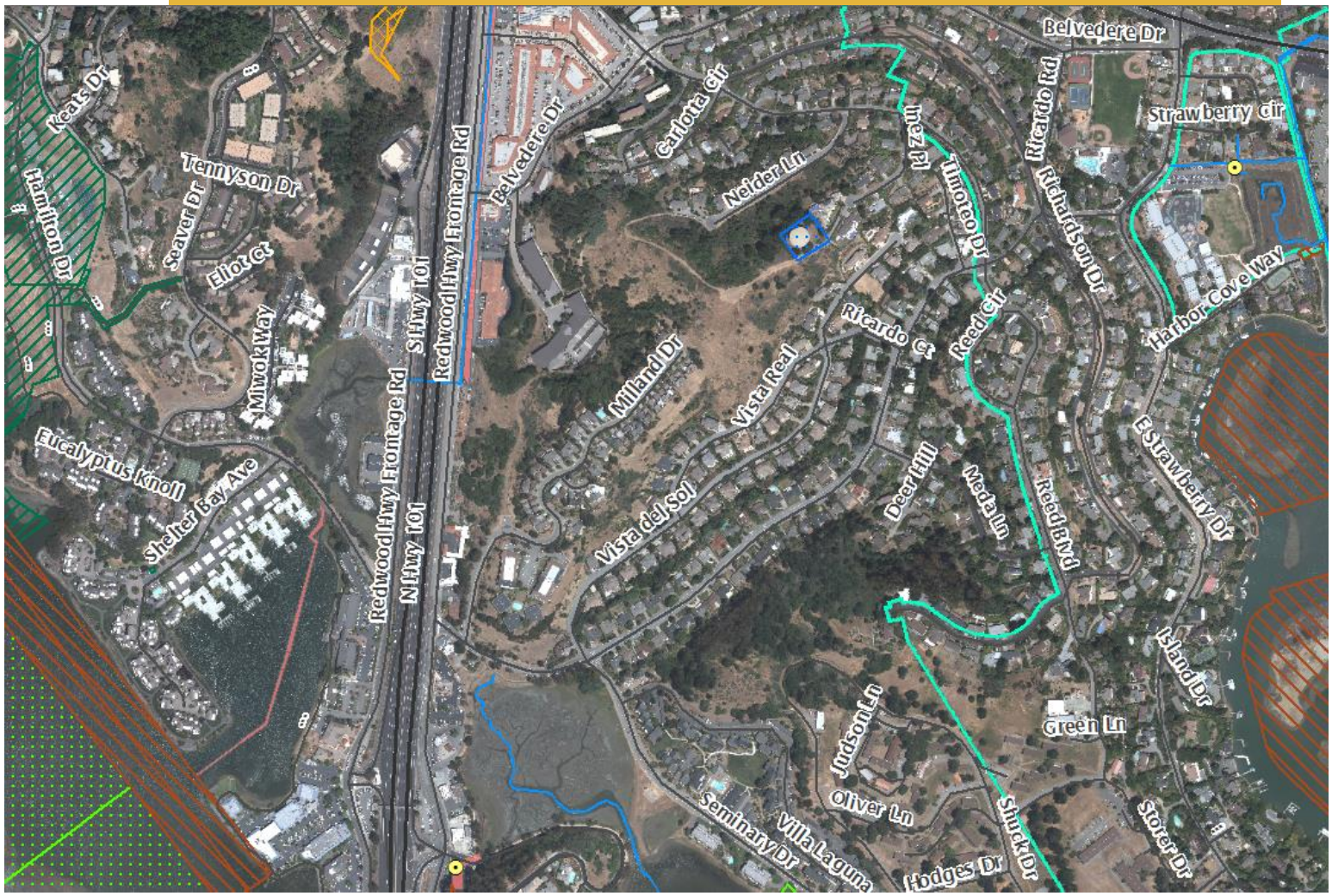
Pink = Easement



COUNTY OF MARIN

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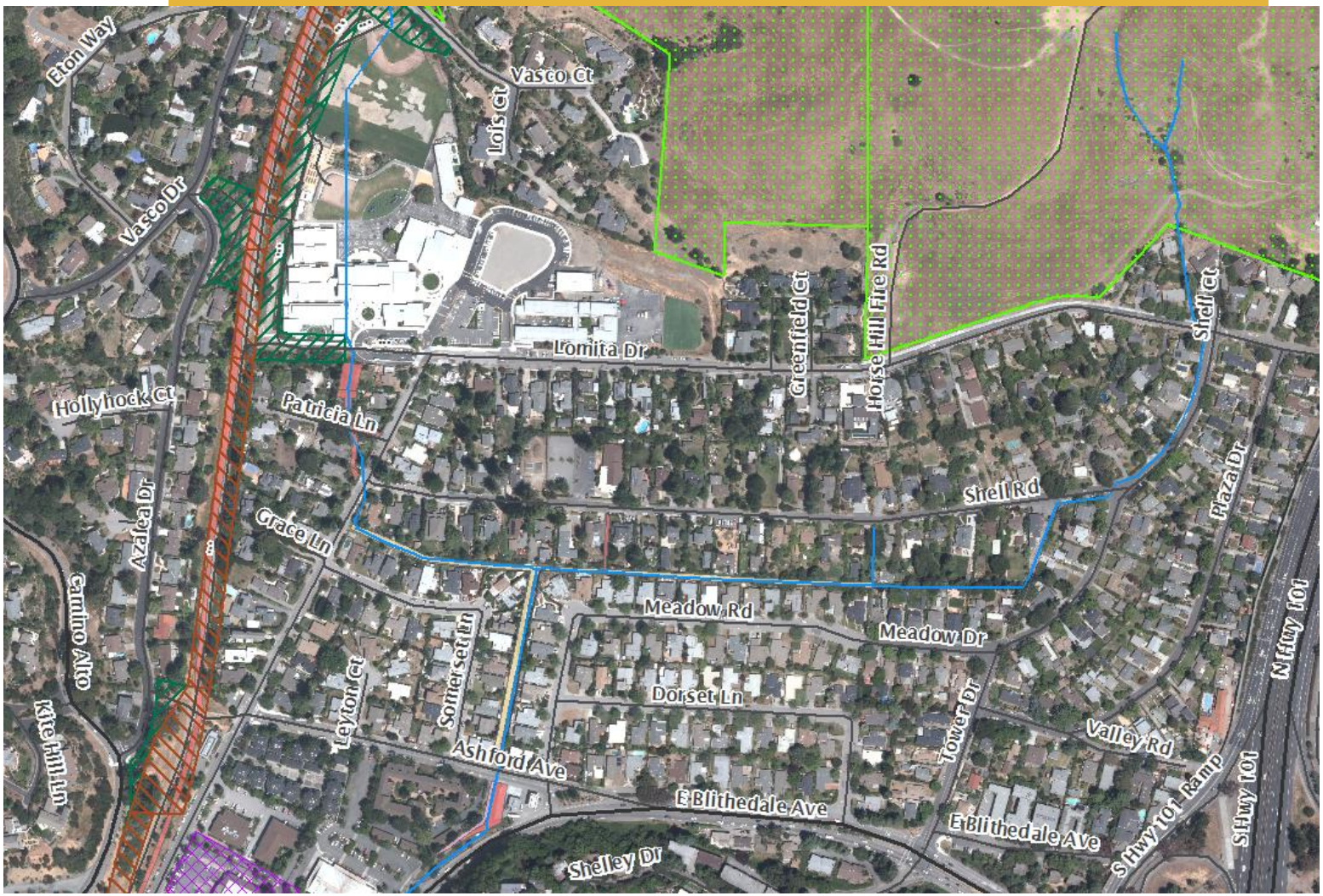

COUNTY OF MARIN

FLOOD CONTROL FEE TITLE & EASEMENTS

Red = Fee Title
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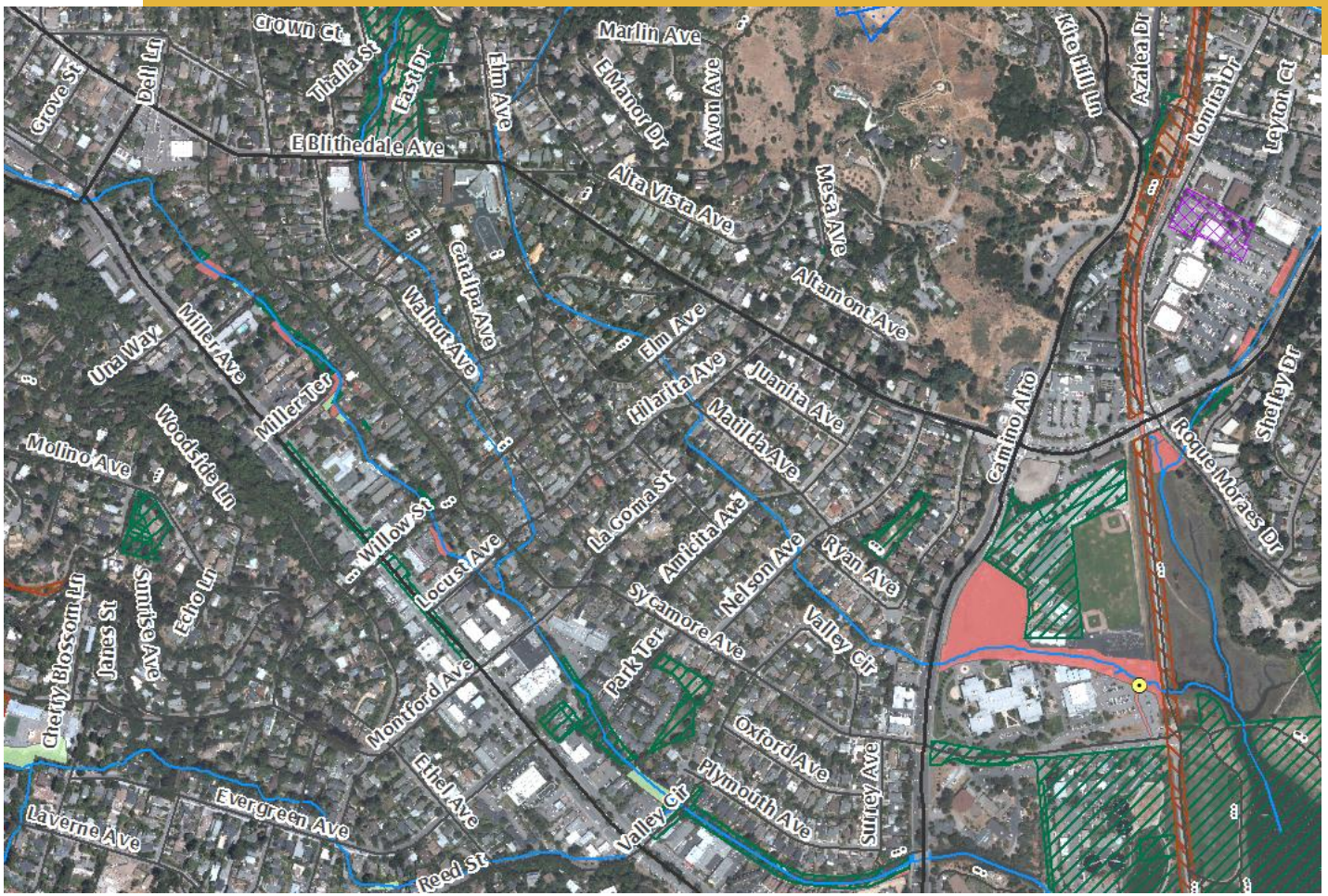

COUNTY OF MARIN

Marin County Flood Control &
Water Conservation District

Flood Control Zone 3

QUESTIONS?

Photo Credit: Jeff Wong

COUNTY OF MARIN

ANTICIPATED 5-YEAR ZONE 3 CASH FLOW

FY 2015-2016 Fund Ending Balance: $ 8,297,665

Proposed budget, subject to change

	Expected Expenditure Description Many expenditures include 3% annual increase	**FY 2015-16 Actuals**	**FY 2016-17 Budget**	**FY 2017-18 Proposed**	**FY 2018-19 Estimate**	**FY 2019-20 Estimate**
	Staffing Costs					
1	Pump Operation & Maintenance	$85,566	$ 95,000	$ 96,003	$ 97,533	$ 99,109
2	Creek and Levee Maintenance	$88,490	$ 100,000	$ 132,006	$ 105,066	$ 108,218
3	General Zone and USACE Project Administration	$148,358	$ 175,000	$ 189,263	$ 194,940	$ 200,789
4	Engineering Planning	$7,268	$ 105,000	$ 108,150	$ 111,395	$ 114,736
5	Environmental Planning	$3,264	$ 62,000	$ 63,860	$ 65,776	$ 67,749
6	Environmental Permitting and CEQA	$8,189	$ 14,000	$ 13,670	$ 13,670	$ 13,670
7	GIS and Surveying	$9,849	$ 10,000	$ 10,000	$ 10,000	$ 15,000
8	Outreach	$6,024	$ 10,300	$ 10,609	$ 10,927	$ 11,255
9	Zone Meeting and Board of Supervisors Admin	$15,207	$ 26,000	$ 26,780	$ 27,583	$ 28,411
10	QA/QC and Strategy	$30,245	$ 103,000	$ 106,090	$ 109,273	$ 112,551
11	Engineering and Real Estate	$16,792	$ 80,000	$ 80,000	$ 80,000	$ 80,000
12	Flapgate Maintenance and Storm Response	$27,490	$ 47,000	$ 48,410	$ 49,862	$ 51,358
13	County Special Cost Allocation	$89,787	$ 90,000	$ 89,787	$ 89,787	$ 89,787
14	***Salaries, Benefits, and Overhead***	**536,529**	**$ 917,300**	**$ 974,628**	**$ 965,812**	**$ 992,633**
15	Utilities	15,513	$ 16,000	$ 16,000	$ 16,000	$ 16,000
16	Rent (Storage and Space)	2,184	$ 2,200	$ 2,200	$ 2,200	$ 2,200
17	Association Dues and Memberships	2,810	$ 4,200	$ 4,200	$ 4,200	$ 4,200
18	***Maintenance & Repair Services - Equipment***					
19	Cardinal Pump Station Pump #1		$ 30,900			
20	Cardinal Pump Station Pump #2			$ 31,827		
21	Crest Marin Pump Station Pump #1	27,455				
22	Crest Marin Pump Station Pump #2					$ 33,765
23	Crest Marin Pump Station Pump #3					$ 33,765
24	Crest Marin Pump Station Pump #4					$ 33,765
25	Ryan Creek Pump Station Pump #1	27,455				
26	Ryan Creek Pump Station Pump #2		$ 33,940			
27	Seminary Drive Pump Station Pump #1				$ 10,927	
28	Seminary Drive Pump Station Pump #2				$ 10,927	
29	Shoreline Pump Station Pump #1					
30	Shoreline Pump Station Pump #2					
31	Shoreline Pump Station Pump #4					
32	Precipitation & Stream Gauge, Alert & Camera System	5,320	$ 15,000	$ 10,840	$ 11,165	$ 11,500
33	Clean/Ream and Inspect 54 Pipes at Coyote Creek*		$ 60,000			
34	Other (incl. Miltronics for Seminary)	8,084	$ 50,000	$ 51,500	$ 53,045	$ 54,636
35	***M&R-Equip***	**68,314**	**$ 189,840**	**$ 94,167**	**$ 86,065**	**$ 167,433**
36	***Maintenance & Repair Services - Land***					
37	District Vegetation/Sediment Maintenance	6,933	$ 83,327	$ 170,000	$ 175,100	$ 180,353
38	Mill Valley Vegetation/Sediment Maintenance (grant)	21,999	$ 115,000	$ 90,000	$ 90,000	
39	Other (Includes Tree/Fence Repair)	17,366	$ 51,500	$ 53,045	$ 54,636	$ 56,275
40	*Coyote Creek Levee*					
41	Rodent Abatement	3,280	$ 15,000	$ 15,000	$ 15,000	$ 15,000
42	Tennessee Valley Pathway Wetlands Restoration			$ 118,400		
43	Remove Unauthorized Coyote Levee Encroachments*				$ 250,000	
44	***M&R-Land***	**49,578**	**$ 579,667**	**$ 602,952**	**$ 735,011**	**$ 485,198**
45						
46	***Professional Services***					
47	Study Contingency	32,536	$ 75,000	$ 75,000	$ 75,000	$ 75,000
48	Marin City Drainage Study***		$ 220,000			
49	Mill Valley Studies (grant)		$ 320,000			
50	Website Update		$ 8,000			
51	*Coyote Creek Levee*					
52	Incorporate Changes to Coyote Creek into Project*			$ 100,000	$ 355,000	
53	Coyote Creek Survey And Hydraulic Study			$ 40,000		$ 40,001
54	Nyhan Creek Flood Study			$ 20,000		
55	Finalize Coyote Creek O&M Manual Update*			$ 60,000		
56	***Construction***					
57	Coyote Creek Sediment Removal			$ 200,000	$ 1,000,000	
58	Mill Valley Projects (grant)		$ 650,000			
59	Rehabilitate/CCTV Penetrating Pipes*		$ 30,000	$ 90,000		
60	Abandon Penetrating Pipes*			$ 120,000		
61	Install Tide Gage on Coyote Creek			$ 12,000		
62	Construction Contingency (such as Manzanita)		$ 100,000	$ 100,000	$ 100,000	$ 100,000
63	***Supplies***					
64	Muscle Wall	61,420				
65	Other (Misc. creek, levee, and pump supplies)	12,102	$ 70,000	$ 72,100	$ 74,263	$ 76,491
66	**Service and Supplies**	**362,349**	**$ 2,264,907**	**$ 2,149,231**	**$ 3,118,540**	**$ 1,385,584**
67	**Total Expenditures**	**898,878**	**$ 3,182,207**	**$ 3,123,859**	**$ 4,084,352**	**$ 2,378,217**
	Revenues (increase approx. 0.5% annually)	1,808,797	$1,817,841	$1,826,930	$1,836,065	$1,845,245
	Fund Ending Balance*	8,297,665	$ 6,933,299	$ 5,636,371	$ 3,388,083	$ 2,855,111

*To be updated after additional information is obtained.

**Fund ending balance will change with updated information.

***Additional $220,000 to come from TAM grant

Note: budgets for projects not expended this fiscal year will roll over into the next fiscal year

May 16, 2017

Scott McMorrow
Assistant Engineer, Marin County Flood Control Zone 3
3501 Civic Center Drive, Room 304
San Rafael, CA 94903

RE: Additional Funding Request for the City's Flood Control and Drainage Master Plan Study

Dear Mr. McMorrow:

On July 19, 2016 the Board of Supervisors approved a funding agreement that authorized the expenditure of $265,000 of Flood Zone 3 funds for the development of a Comprehensive Flood Control and Drainage Master Plan for the City. The City had previously requested this amount of funding not knowing how much a master plan would cost.

The City advertised a Request for Proposals in January and received four proposals in February. The City interviewed all four firms in March and selected Schaaf and Wheeler based on their experience and qualifications preparing similar master plans for other agencies and their approach to our project.

Schaaf and Wheeler's fee proposal exceeded the amount that the City requested and the County granted by $135,000. County Flood Control staff offered to review the proposal and meet with City staff and the Schaaf and Wheeler team to determine if there were ways to reduce the project scope and cost without sacrificing content. Thanks to the County staff's assistance, the cost of the Master Plan was reduced by $25,000. Additional savings could have been achieved if MCSTOPP staff could have been utilized to perform field surveys of our drainage infrastructure as they have completed for other cities. Unfortunately we have been told MCSTOPP no longer has the staff available to perform this service for agencies.

City property owners have been paying an assessment for flood control services on their property tax bills for addressing flood issues. The funds contributed by Mill Valley properties make up almost half of Flood Zone 3's annual revenue. Until recently the City has not been active in the development of flood control and drainage projects and therefore has made few requests from Zone 3 for funds. A case could be made that a large percentage of the current fund balance of Zone 3 should be earmarked for projects that benefit City of Mill Valley property owners. Upon the completion of the Flood Control and Drainage Master Plan, the City will be in a position to make

additional requests for project funding to Zone 3.

In order to fully fund the Master Plan, the City needs an additional $110,000. We believe that it is appropriate for these funds to come from Zone 3. Zone 3 has funded many planning studies proposed by County Flood staff over the years. This planning document should be handled no differently. Therefore the City is requesting that our funding agreement be amended to reflect the true cost to complete the Flood Control and Drainage Master Plan. The additional amount requested is $110,000.

We are requesting that this request be presented to the Zone 3 Advisory Board at its meeting on May 25 for inclusion in the budget for fiscal year 2017/2018 and supported by County staff.

Thanks again for your team's help in reviewing and confirming the scope of the Master Plan and in reducing the overall project cost. Please let me know if you have any questions. Thank you for your consideration.

Sincerely,

Andrew D. Poster, PE, TE
City of Mill Valley
Public Works Director

Cost Proposal
for
City of Mill Valley
Citywide Flood Control and Storm Drainage Master Plan
Phase 1

Proposal by

Schaaf & Wheeler

CONSULTING CIVIL ENGINEERS

May 2017

5. Work Plan, Schedule and Deadlines

Phase 1 – Analysis and Improvements

Phase 1 of this master plan will encompass the analysis of the City's drainage and flood control systems to determine the current level of service for each major component. The team will work with City staff, community members and other stakeholders to establish the level of service desired in each portion of the City. Capital improvements will be developed to bring these systems up to an acceptable level of service. Planning level cost estimates will be developed for each improvement projects. This analysis will be summarized in a report and presented to the City and stakeholders.

Task A – Data Collection and Review

Schaaf & Wheeler compile and review readily available data relate to the City's drainage and flood protection systems. Material may include reports by other engineers, hydrologic and hydraulic models, GIS data, topographic mapping, as-built plans, and local and regional plans.

Schaaf & Wheeler will review readily available reports and hydrologic and hydraulic models within Mill Valley's watersheds. This existing information will be the basis for much of the flood control portions of this study. We plan to further review the sources of flooding and possible solutions in these reports and make modifications as needed. Our goal is to minimize our efforts by not duplicating analyses completed by other engineers. This review will expose possible data gaps and limitations that would be refined under this master plan.

Conversations with City staff, particularly the Operations and Maintenance division, will help Schaaf & Wheeler understand the historic flooding issues within the City. Our experience has shown that the people in the field can identify issues that frequently are not picked up by models. Staff's knowledge of the system will highlight regions of perpetual flooding, possible causes of flooding and interim solutions. This information will be documented and included in the master plan report.

Schaaf & Wheeler will analyze the Mill Valley watersheds from headwaters to the bay. The watershed hydrology used in previous studies will be reviewed for consistency with long term gage statistics and applicability on the urban drainage systems within the City. We plan to utilize existing HEC-HMS models developed by other engineers. This scope assumes HEC-RAS models are readily available and can be used for master planning purposes to provide boundary conditions to the pipe model, but does not include additional modeling of the stream network beyond what has already been completed. Schaaf & Wheeler will create hydraulic models of the urban system utilizing software designed for pipe networks in Task C.

Task B - Storm Drain Infrastructure Inventory

Schaaf & Wheel has reviewed the storm drain GIS data available from MarinMap. This geodata along with any other paper or electronic system mapping will form the basis of our study and will be augmented with additional data collected in the field. This task is inclusive of a field review of the urban drainage system to capture additional and more detailed system data. Schaaf & Wheeler engineers will spend up to ten days in the field verifying the GIS data and collecting drainage attributes. If the County can provide a survey of the existing infrastructure prior to modeling efforts, this task can be reduced to 5 days in the field. City, Caltrans, County and FEMA archives and as-built plans will also provide necessary data.

According to MarinMap GIS data there are over 200 CMP pipe segments within Mill Valley. These pipes are highly susceptible to corrosion and failure. We will work with the City to prioritize portions of the drainage system that should be analyzed for condition. The teams CCTV consultant will spend up to four days in the field inspecting drainage systems.

Task C – Existing Conditions Analysis

The existing drainage system 18-inches in diameter and greater will be analyzed as part of this project. Storm drain network and creek channels work in concert to convey runoff through the City and should be analyzed as a comprehensive system. Schaaf & Wheeler will develop hydraulic models that utilize existing creek model results to effectively determine the relationship and performance of these systems. Facilities that do not have conveyance capacity for the various design events will be identified. Areas of the City with no or minimal flood protection or drainage facilities will also be identified. Facilities with known condition deficiencies, or with deficiencies identified during Schaaf & Wheeler's field reconnaisance, will be idenfitied as well (i.e. pipe corrosion, overgrown channel, etc.). Additonal creek models (HEC-RAS) will not be developed under this scope of services.

Thematic maps for each desisgn event (2-year, 10-year, etc) will be presented to the City for review and discussion. The newly developed models will also be available the the County for technical review.

Task D - Flood Reduction Goals and Objectives

Developing flood protection and drainage performance goals for Mill Valley will be a complex task. Many idealistic approaches and goals may become cost prohibitive quickly. Our job as engineers is to synthesize all relevant information along with citizen and task force input to develop an effective set of goals that are actionable and attainable within a reasonable range of costs. There is no benefit to developing a improvement projects no one wants or the City cannot afford. The citizen workshop in Task I will be critical in developing project goals.

There will likely be a different level of protection of the interior drainage systems than the creek channels and shorelines. The level of service of the City's storm drain system and flood control channels will be directly impacted by the citizens' willingness to fund the necessary improvements to provide a certain level of protection. Our team will work closely with the City, task forces and stakeholders to find the appropriate levels of protection for Mill Valley. Schaaf & Wheeler and City staff will finalize and document the levels of service to be used in the following tasks.

Task E –Capital Improvements and Plan

Previous engineering studies have identified possible flood control measures for Mill Valley. Schaaf &Wheeler plans to refine those concepts and develop additional alternatives to assure the City makes informed decisions in protecting itself from flooding. Alternatives may include setback levees or floodwalls, bypass conveyance, detention, bridge and culvert replacements, as well as interior drainage solutions such as pumping, grading, floodproofing, pipe upsizing, and multi-use facilities. Drainage system improvements will be developed using the hydraulic models from Task C and the levels of service from Task D.

Schaaf & Wheeler will work with the City to identify a preliminary list of CIP projects. We assume we will develop conceptual designs sufficient to estimate the cost for the high priority projects using a combination of unitized costs and site-specific details. For any identified system expansion projects, Schaaf & Wheeler will develop a skeletonized system expansion to service these areas. Pipe alignments will be based on topography and downstream system capacity. Isolated locations may require pumping due to topographic restraints. Pumps will be sized based on the updated drainage criteria.

Mill Valley is situated along the San Francisco Bay and subject to tidal inundation. Providing shoreline protection is necessary to protect low-lying parcels and allow all citizens access in and out of town. Schaaf & Wheeler will incorporate a planning level shoreline protection strategy that uses the work that has already been completed by the County to help understand the magnitude of the costs associated with this protection. It is important to note that there are several modes of shoreline protection. Schaaf & Wheeler's approach is merely a starting point.

Contingencies will be added to account for administration, permitting, design, construction management, and construction costs. The Schaaf & Wheeler team will compile project costs from several storm drainage projects throughout Marin County and will utilize that data to develop realistic unitized costs for CIP projects.

The prioritization of the capital improvement projects will be based on a combination of project costs and benefits, flooding potential and City feedback. The hydraulic models will identify the depth and duration of potential flooding during the identified levels of service determined in Task D. Our team will meet with the City to explain the various improvement projects, their associated costs and their benefits. Criteria to be included in a project ranking matrix will be developed in conjunction with City staff for prioritization. Our goal is to rank projects in high, moderate and low priorities. Cost often strongly influences project priority rankings.

Task F - Sea Level Rise

Portions of the drainage and flooding issues in Mill Valley are related to the City's proximity to the San Francisco Bay. When Bay tides rise, low lying areas can be inundated and drainage systems don't perform properly due to backwater effects. These issues will be exacerbated by sea level rise. Schaaf & Wheeler will work with the City and County to develop appropriate tidal regimes and sea level rise scenarios for this study. Our work will be integrated with Marin County's current efforts for shoreline adaptation and we plan to coordinate closely with that task force.

Task G – Alternatives Analysis

Based on County and City staff review of the preliminary CIPs and cost estimates developed under Task E, Schaaf & Wheeler will develop project alternatives for the highest priority projects. These alternatives will consider feedback from the project task force, funding strategies, multi-benefit goals, climate change and other parameters.

Environmental issues will be summarized and documented, but a more in depth environmental analysis will be conducted by the team's local permitting specialist, WRA in Phase 2. Schaaf & Wheeler understands how beautiful Mill Valley is and that the community wants to retain is character. We plan to vet all our CIPs with stakeholders to develop projects the community truly supports. Without the support of the community funding becomes extremely difficult.

Project alternatives will be analyzed with the hydrologic and hydraulic models to assure they provide the necessary level of protection. Project costs for each alternative will be developed in the same manner as the initial CIPs. Shoreline protection alternatives will be further developed utilizing available information and feedback from stakeholders.

Task H – Funding Strategy

NBS will prepare a preliminary study that will outline the revenue mechanisms the City can consider for funding its storm drain system needs. This study will provide an analysis of the available funding mechanisms and a description of the approval threshold and process to implement each, such as:

- Property-related fees
- Development impact fees
- Community Facilities District (CFD)
- General Obligation Bond
- Special Assessment District

The purposes of this analysis will be to determine the full-range of options available to the City in funding storm drainage needs, and what options would work the best for the City. Phase 2 includes a more detailed look into establishing a dedicated funding source for the storm drain system.

Task I - Public Outreach and Engagement

An outreach process designed to keep the community informed and to solicit input from a broad range of stakeholders will be an integral part of this project. Throughout this project the Schaaf & Wheeler team plans to be engaged the citizens of Mill Valley. Their involvement in the master planning process is paramount in developing actionable improvements and getting projects funded. We will work with City staff to hold a series of public and task force meetings throughout the project duration. We are budgeting for one community workshop, four task force meetings, and one city council presentation as part of Phase 1 for a total of 6 meetings. We plan to utilize Eileen Goodwin of Apex Strategies who specializing in public outreach and community. Eileen will work with the City to develop effective tools to engage stakeholders through meetings, workshops and social media interaction. Our team will assist the City in creating the agenda and format of the meetings, prepare presentation and meeting materials, and facilitate the meetings. It is assumed the City will assist in facilitating meetings by handling logistics and announcements, and writing a summary of each meeting.

The initial public meeting at the start of the study will be to gather data and understand key concerns of the citizens, along with thoroughly explaining the master planning process.

A citizen task force, compiled by City staff, will be updated on the project status and asked for input throughout this project. We have budgeted for three formal task force meetings. The initial meeting will introduce the task force to the project team, explain Schaaf & Wheeler's scope of work, indicate the goals and mission of the task force and allow members to express their desires related to flood control and drainage. The second meeting will review the results of the hydrologic and hydraulic analyses, and develop a level of service. The third meeting will examine the capital improvement and costs, and solicit input for project alternatives. The final meeting will summarize the project findings, funding strategies, and present the project alternatives and associated costs.

The draft master plan report will be presented to the city council after staff review. This presentation will explain the master planning process, system constraints, projects to achieve the desired level of service, costs and alternatives, and next steps.

The team will provide the City with a project information data sheet (Fact Sheet) that can be uploaded easily for public viewing on the City's website. The intent of the Fact Sheet is to answer many of the public's frequently asked questions about the project. This Fact Sheet may be updated after meetings or as new information arises that needs to be disseminated to the community. The team can also support the City staff with dissemination of project information through the City's existing social media.

Task J – Coordination with Stakeholders

Schaaf & Wheeler will coordinate with City staff to address questions or concerns from citizens, task forces, Marin County Flood Control, and other agencies. We understand that in many instances these stakeholders need quick responses to their concerns. Schaaf & Wheeler will work with the City to develop an effective protocol to communicate with various groups.

Task K – Flood Control and Storm Drain Master Plan Report

The Schaaf & Wheeler team will prepare a comprehensive master plan document and present the project findings to various audiences.

Draft Report

Schaaf & Wheeler will produce a complete draft master plan report that will:

- discuss determined level of service,
- summarize existing drainage system and creek channel condition,
- outline the system's current performance,
- detail areas currently subject to flooding,
- present future climate change impacts,
- list and prioritize improvement projects,
- estimate costs for improvements, and
- document technical methodologies and model results.

Schaaf & Wheeler will work with City staff to develop a master plan format that works best for the community. The document will be formatted and organized to layer the study information. It will provide a concise overview of the study findings and recommendations in simple non-technical terms with sufficient information for the general public and City officials outside the engineering field, such as the Council members, to understand. The report will also supply the technical community with detailed implementable information to execute proposed projects. CIPs and project schedules will be well-organized and could become the nexus for a storm drain fee. Appendices supplied as a part of the Citywide Flood Control and Storm Drainage Master Plan will include model results, improvement figures and detailed cost estimates. The report will be supplied in hard copy as well as electronically, in PDF format.

Final Report

The Final Report will be submitted once City comments on the draft report have been incorporated and the CIP and project implementation schedule have been finalized.

Cost Proposal
for
City of Mill Valley
Citywide Flood Control and Storm Drainage Master Plan
Phase 2

Proposal by

Schaaf & Wheeler

CONSULTING CIVIL ENGINEERS

May 2017

5. Work Plan, Schedule and Deadlines

Phase 2 –Funding, Outreach and Environmental Analysis

Phase 2 of this master plan will assist the City in developing funding mechanisms, providing additional public outreach, and analyze environmental impacts and permitting requirements for the high priority CIPs developed under Phase 1. The team will look at funding strategies and develop conceptual rate structures to finance the prioritized projects. Phase 2 will include significant public engagement as well as feedback from City staff and other stakeholders. Addendums to the SDMP will be prepared to summarize the fee study and environmental analysis.

Task L – Fee Study

Subconsultant NBS will prepare a plan for funding the City's storm drainage costs and conduct the research and analysis necessary to identify the various funding options best suited to the City's needs. NBS will conduct the research to determine how other agencies have funded storm drainage costs, either through a local special tax, property-related fee or a bond financing mechanism, and if funding was secured through federal, state, regional or other funding sources. The purpose of this analysis and research will be to determine the full-range of options available to the City in funding storm drainage needs, and what options would work the best for the City. A 20-year financial plan for the City's storm drainage system and a technical memorandum will be submitted for review by City Staff and Council that includes our recommendations for the funding mechanism(s) the City should consider. This report will be compiled into an Addendum to support the SDMP from Phase 1. Schaaf & Wheeler will support NBS with CIP coordination, alternatives, and cost estimations.

Task M – Public Outreach

This task will build off of the initial six meetings that were hosted under Phase 1. These meetings will focus on funding and public willingness to pay for CIPs.

This task assumes two additional task force meetings to better understand the citizens willingness to pay, one community meeting, and one council meeting.

Public Outreach Meetings. The team will prepare for, facilitate, and attend up to three formal public outreach community meetings during the duration of the project. We will assist the City in creating the agenda and format of the meetings, prepare

Task N – Environmental Analysis

The team's local permitting specialist, WRA, will conduct a review of biological resources that may constrain the various improvement project alternatives. Available previous completed environmental studies related to the projects, including Environmental Impact Reports or CEQA studies, will be reviewed. Project sites will be examined for protected sensitive habitats including wetlands and waters potentially subject to jurisdiction by the Army Corps of Engineers (Corps), Regional Water Quality Control Board (RWQCB), or CDFW. A list of regulatory agencies that may require permits will be made for the most viable projects.

WRA will conduct a review of the California Department of Fish and Wildlife (CDFW) Natural Diversity Data Base, the California Native Plant Society (CNPS) online inventory, and the US Fish and Wildlife Service (USFWS) county list to determine which protected species and/or critical habitat potentially occur in the vicinity of the site. Based on this search, and a review of other CDFW lists and publications, a list of special-status species with a moderate or greater potential to occur within the Project Area will be generated. In addition, available aerial photography, USGS maps, and other sources will be reviewed for the potential location of wetland (tidal and non-tidal), riparian or other sensitive habitats and species that could be impacted by the proposed project alternatives.

Possible impacts to special-status species located within the footprint of the proposed projects will be the focus of analysis; however, any potential indirect impacts from the project will also be assessed. Results of the environmental analysis will be compiled into an Addendum to support the SDMP from Phase 1.

City of Mill Valley
Public Works Department
Engineering Services for
Flood Control and Storm Drainage Master Plan
Schaaf & Wheeler
Phase 1 Fee Proposal - May 12, 2017

Task	Hourly Rate	*Project Manager*	*Senior Engineer*	*Associate Engineer*	*Junior Engineer*	*Engineering Aide*	*Schaaf & Wheeler Subtotal*	*NBS Financial Subconsultant*	*Apex Strategies Public Outreach Subconsultant*	*V&A Associates Condition Assessment Subconsultant*	*Subsonsultant Markup (10.%)*	*Total*
		$225	$200	$180	$150	$105						
A	Data Collection and Review	4	14	12	12	12	$ 8,920				$ -	$ 8,920
B	Storm Drain Infrastructure Inventory	2	4		80	80	$ 21,650			$ 8,000	$ 800	$ 30,450
C	Exiting Conditions Analysis	12	80	12	120	40	$ 43,060					$ 43,060
D	Develop Flood Reduction Goals and Objectives	4	12				$ 3,300				$ -	$ 3,300
E	Capital Improvements and Plan	24	80	72	120		$ 52,360					$ 52,360
F	Sea Level Rise	4	12				$ 3,300				$ -	$ 3,300
G	Alternatives Analysis	8	64	80			$ 29,000					$ 29,000
H	Funding Stategies	2	4				$ 1,250	$ 9,000			$ 900	$ 11,150
I	Public Outreach and Engagement	24	40	8	12		$ 16,640	$ 1,000	$ 24,000		$ 2,500	$ 44,140
J	Coordination with Stakeholders	32	16				$ 10,400				$ -	$ 10,400
K	Flood Control and Storm Drain Master Plan Report	12	64	24	60		$ 28,820				$ -	$ 28,820
	Total	**128**	**390**	**208**	**404**	**132**	**$ 218,700**	**$ 10,000**	**$ 24,000**	**$ 8,000**	**$ 4,200**	**$ 264,900**

City of Mill Valley
Public Works Department
Engineering Services for
Flood Control and Storm Drainage Master Plan
Schaaf & Wheeler
Phase 2 Fee Proposal - May 12, 2017

Task	Hourly Rate	*Project Manager*	*Senior Engineer*	*Associate Engineer*	*Junior Engineer*	*Schaaf & Wheeler Subtotal*	*NBS Financial Subconsultant*	*Apex Strategies Public Outreach Subconsultant*	*WRA Environmental Subconsultant*	*Subsonsultant Markup (10.%)*	*Total*
		$225	**$200**	**$180**	**$150**						
L	Fee Study		32			$ 6,400	*$ 40,000*			*$ 4,000*	*$ 50,400*
M	Outreach	20	30	12	8	$ 13,860	*$ 4,000*	*$ 12,000*		*$ 1,600*	*$ 31,460*
N	Environmental Analysis	4	20		8	$ 6,100			*$ 10,000*	*$ 1,000*	*$ 17,100*
O	Documentation	8	32		16	$ 10,600				*$ -*	*$ 10,600*
	Total	**32**	**114**	**12**	**32**	**36,960**	**44,000**	**12,000**	**10,000**	**$ 6,600**	**$ 109,560**