Draft Initial Study
Bale Slough - Bear Creek Tributary Restoration Project



September 2021

Prepared for: Napa County Flood Control & Water Conservation District
804 First Street
Napa, California 94559

Prepared by Leonard Charles and Associates
7 Roble Court
San Anselmo, California 94960
(415) 454-4575

Draft Initial Study
Bale Slough - Bear Creek Tributary Restoration Project

September 2021

Prepared for: Napa County Flood Control & Water Conservation District
804 First Street
Napa, California 94559

Prepared by Leonard Charles and Associates
7 Roble Court
San Anselmo, California 94960
(415) 454-4575

TABLE OF CONTENTS

Section		Page
1.	Introduction and Background	1
2.	Project Location and Setting	1
3.	Proposed Project Description	2
4.	Initial Study Checklist	33
5.	Determination	140
6.	Report Preparers	141

List of Figures

1.	Project Site Location	4
2.	Project Sites Within the Project Area	5
3.	Conceptual Cross Section with Island	11
4.	Typical Cross Section	12
5.	Site Map and Haul Routes	14
6.	Bale Slough Project Area	58
7.	Aquatic Habitats in the Project Area	59
8.	Regional Fault Map	following page 84
9.	Soils Map	following page 85
10.	HEC-RAS Inflow Locations	103
11.	Area Used in Storage Modeling Calculations Upstream of Highway 29	105

List of Tables

1.	Project Planting Palette	9
2.	Summary of Project Effects	13
3.	Tree Removals	15
4.	Proposed Project Environmental Commitments Table – Bale Slough Restoration Project	18
5.	Project-Related Emissions (lbs./day) for Group A	50
6.	Project-Related Emissions (lbs./day) for Group B	50
7.	Construction-Related Emissions (lbs./day) for Group C	51
8.	Maximum Project and Cumulative TAC Impacts on Sensitive Receptors near the Project Site Vicinity	54
9.	Proximity to Active Earthquake Faults	84
10.	List of Major Historic Earthquakes	85
11.	HEC-HMS Proposed Condition Peak Flow Results	103

List of Tables

		Page
12.	Change in Peak Flow from Existing Conditions to Proposed Conditions	104
13.	Pre- and Post-Project Flooding/Ponding Elevations Above Highway 29	105
14.	Change in Water Surface Elevation (WSE) Between Existing and Proposed Conditions After Restoration in Group A	106
15.	Change in WSE Between Existing and Proposed After Restoration in Group B	107
16.	Change in WSE Between Existing and Proposed Conditions After Restoration in Group C	108
17.	Napa County Noise Limits for Construction Activities	119
18.	Construction Equipment Noise Emission Levels	120

Appendices

A Project Drawings
B Air Quality Calculations
C Biological Data
D Historic Property Survey Finding of Effect
E Geotechnical Report
F Draft Mitigation Monitoring Program

1.0 Introduction

This Initial Study has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code 21000 et seq. and the State CEQA Guidelines, California Code of Regulations Section 15000 et seq. Changes in land use and management in the Napa River watershed have resulted in confinement of stream channels, loss of riparian and wetland habitat, accelerated channel incision and bank erosion, and ongoing channel degradation and property loss. The Bale Slough-Bear Creek Tributary Restoration Project (Project) includes grading and construction of improvements to improve salmonid and riparian habitat along Bear Creek and Bale Slough in an effort to support native steelhead trout and chinook salmon in the watershed and throughout Napa Valley.

The Project is a joint effort being planned by private landowners and the Napa County Flood Control and Water Conservation District (District) with the goals of 1) re-establishing floodplain and natural geomorphic and hydrologic processes in the Project reach, 2) increasing/enhancing ecological function, fish and riparian habitat, 3) stabilize eroding banks to reduce fine sediment inputs and minimize the need for ongoing channel work, 4) remove non-native/invasive and Pierce's disease host vegetation, 5) improve seasonal wetland hydrologic processes and 6) work with landowners to address interests in regards to protecting adjacent agricultural property. The Project encompasses fourteen (14) separate restoration sites along 3 miles of Bale Slough - Bear Creek between Rutherford Road and just west of State Highway 29.

A design report (Report), including 30% design level plans, for the Project was developed by the Napa County Resource Conservation District (RCD). As currently proposed, the Project would restore portions of approximately 6,000 linear feet of channel between Rutherford Road and State Highway 29, creating and restoring over 15 acres of wetland and riparian habitat throughout the entire proposed Project area utilizing a combination of restoration actions including: channel widening, and floodplain restoration; addition of large woody structures, replanting native riparian vegetation and other actions designed to provide habitat diversity and promote improved physical processes such as increasing coarse sediment deposition of gravels throughout the Project reach in order to enhance spawning habitat for salmonids. The Project will also provide a net expansion of the riparian corridor; expanding wetlands and the riparian habitat; providing floodplain connectivity; stabilizing eroding streambanks; and replanting stream banks and setback berms with native trees and shrubs.

2.0 Project Location and Setting

Bale Slough-Bear Creek is a tributary of the Napa River that runs predominantly east from the foothills of the Mayacamas Mountain Range to the confluence with the Napa River near Rutherford Road (Figure 1). The upper part of the watershed is primarily undeveloped, with productive riparian habitat, and it includes the perennial tributary Bear Creek. The lower reach of Bale Slough-Bear Creek was once part of an alluvial fan wetland complex that historically

provided valuable habitat for Steelhead and Chinook salmon populations in the Napa Valley. This alluvial fan wetland complex also provided groundwater recharge, flood attenuation, and water filtration. However, due to land use changes over the last century the lower reach now flows through a confined channel with reduced habitat quality and function.

Bale Slough and Bear Creek for purposes of this study) is defined as follows: Bear Creek is the tributary stream upstream of Highway 29 that then flows east, beneath Highway 29 into Bale Slough which then flows beneath Rutherford Cross Road and into the Napa River. The portion of this drainage that starts at the upstream end of proposed Project improvements to the point where Bale Slough flows beneath Rutherford Cross Road is defined as the Project reach. The Project reach is approximately 7,000 feet long.

Habitat in the upper Project reach on Bear Creek consists of braided ephemeral channels and seasonal wetlands, while the lower reach below Highway 29 (Bale Slough) is fairly homogenous and consists of a relatively straight, confined channel with long pools, few riffles, steep banks and fine sediment. The alignment of Bale Slough has been altered to define property lines and to accommodate viticulture.

Perennial flow is only found in the upper end of the Bale Slough-Bear Creek watershed, upstream of the Project reach. The flow becomes seasonal once the creek reaches the edge of the valley bottom, downstream of Rutherford Cross Road. Flow in the lower portion of the channel occurs late October to early June depending on seasonal rainfall patterns.

3.0 Proposed Project Description

The purpose of the Project is to restore and enhance long-term stream and floodplain function, increase seasonal wetlands, improve the quality and resilience of aquatic and terrestrial riparian habitat, reduce property damage and fine sediment delivery associated bank erosion and provide a means of compliance with the sediment Total Maximum Daily Load (TMDL) for the Napa River watershed.

Restoration elements and features of the Project include a suite of restoration approaches that are designed to achieve defined restoration goals and objectives, including: setting back earthen berms from the top of the river bank; creating vegetated buffers between the stream channel and adjacent land uses; creating more complex habitat to provide high-flow refugia for native fish; installing instream structures to improve aquatic habitat; removing non-native invasive and Pierce's disease host plants; planting native understory species; and installing biotechnical bank stabilization features in order to stabilize actively eroding banks. The Project will also include an annual maintenance and monitoring program funded by landowner assessments which will adaptively manage bank erosion, debris removal, , invasive and Pierce's Disease host plants, repair constructed habitat features and conduct long-term monitoring of to ensure restored areas perform as designed and meet goal and objectives. The Project has

strong landowner participation and will include the formation of a landowner advisory committee (LAC) established to guide adaptive management needs within the respective Project area.

Project Objectives

The Project will improve habitat conditions for Steelhead and Chinook Salmon within the Napa River watershed through implantation of the Bale Slough-Bear Creek project by achieving the following objectives:

- Minimize the need for ongoing channel stabilization and repair work by establishing a more self-sustaining channel design which reduces maintenance needs;
- Enhance geomorphic channel forms and processes to support a more diverse and complex instream condition;
- Increase floodplain connectivity where possible;
- Expanding and enhancing riparian habitat with a focus to improve habitat for both aquatic and terrestrial wildlife;
- Removal and management of invasive non-native vegetation and replanting with native vegetation that will not promote Pierce's disease in vineyards; and
- Support the sediment reduction and habitat enhancement goals of the Napa River Sediment Total Maximum Daily Load (TMDL).

Project Description

The Bale Slough-Bear Creek Tributary Restoration Project (Project) was first proposed by the Napa County Resource Conservation District (RCD). The RCD initially obtained funding to develop conceptual designs, and then the County of Napa (County) acquired additional grant funds to complete 100% construction plans and complete environmental review for the Project. Project construction, which will be grant funded, will be overseen and managed by the Napa County Flood Control and Water Conservation District (District).The Project will improve salmonid and riparian habitat along Bear Creek and Bale Slough in an effort to support native Steelhead trout and Chinook salmon in the watershed and throughout Napa Valley. Project designs were refined with landowner input and coordination. After detailed studies revealed several potentially sensitive cultural resources were located adjacent to, and may be within, the proposed Project area, initial grading areas that may have impacted these resources if implemented were removed from the Project area in order to avoid and minimize any potential impacts to said resources.

The Project area is divided into three construction groups; Group A, B, and C and further divided into 14 individual restoration Sites. Details about these 14 sites and the restoration work to be completed at each site are included in Appendix A of this Initial Study. Where necessary, existing grapevines will be removed from the Project area. Group A will impact 2.2 acres of vineyards and Group B will impact 0.9 acres, and Group C will involve no removal of

active vineyard areas. As currently proposed, the Project would restore portions of approximately 6,000 linear feet of channel between State Highway 29 and Rutherford Cross Road, creating and/or restoring over 15 acres of wetland and riparian habitat throughout the proposed Project reach. This restoration efforts will use a combination of restoration actions including:

- Channel widening, floodplain restoration and addition of large wood structures in Groups A, B and C
- Stabilization of actively eroding banks and expansion of the riparian corridor in Groups A and B
- Agricultural berm setbacks in Groups A and B
- Expansion of existing wetland and re-connection to adjacent floodplains in the alluvial floodplain above (west) of Highway 29 (Group C)

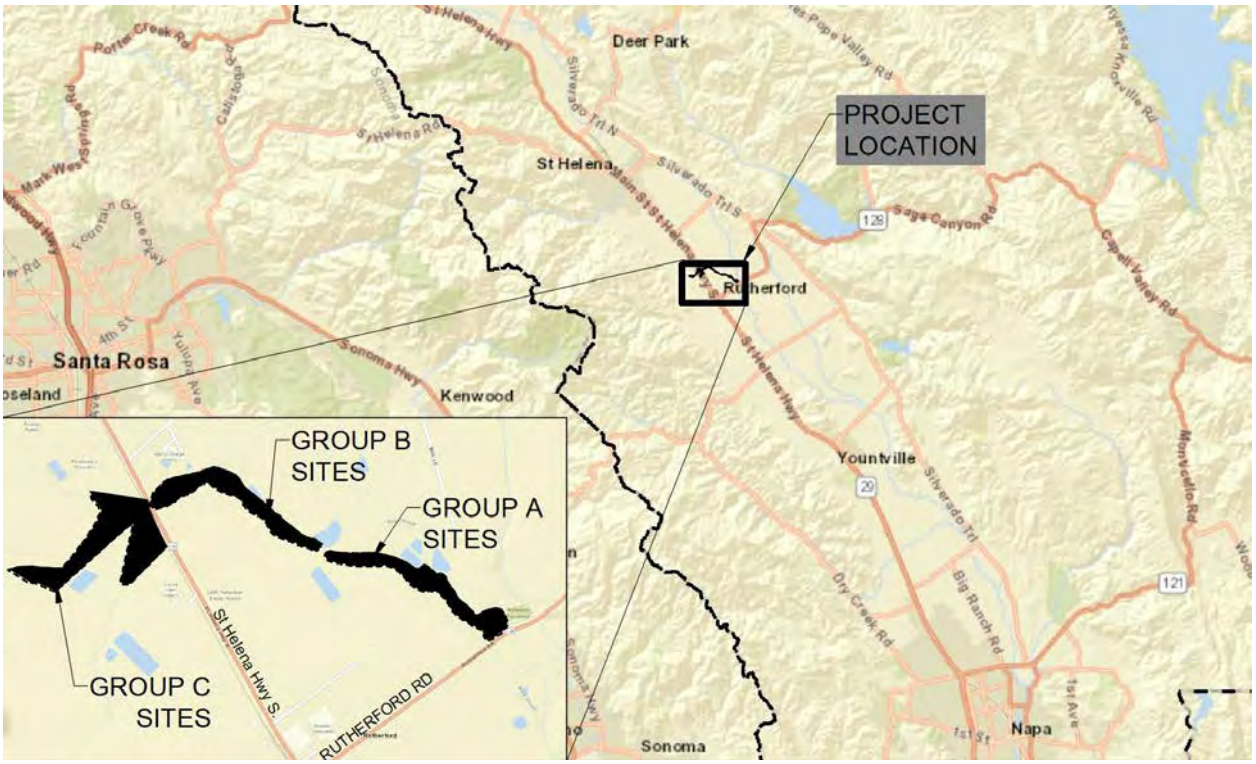


Figure 1- Project Site Location

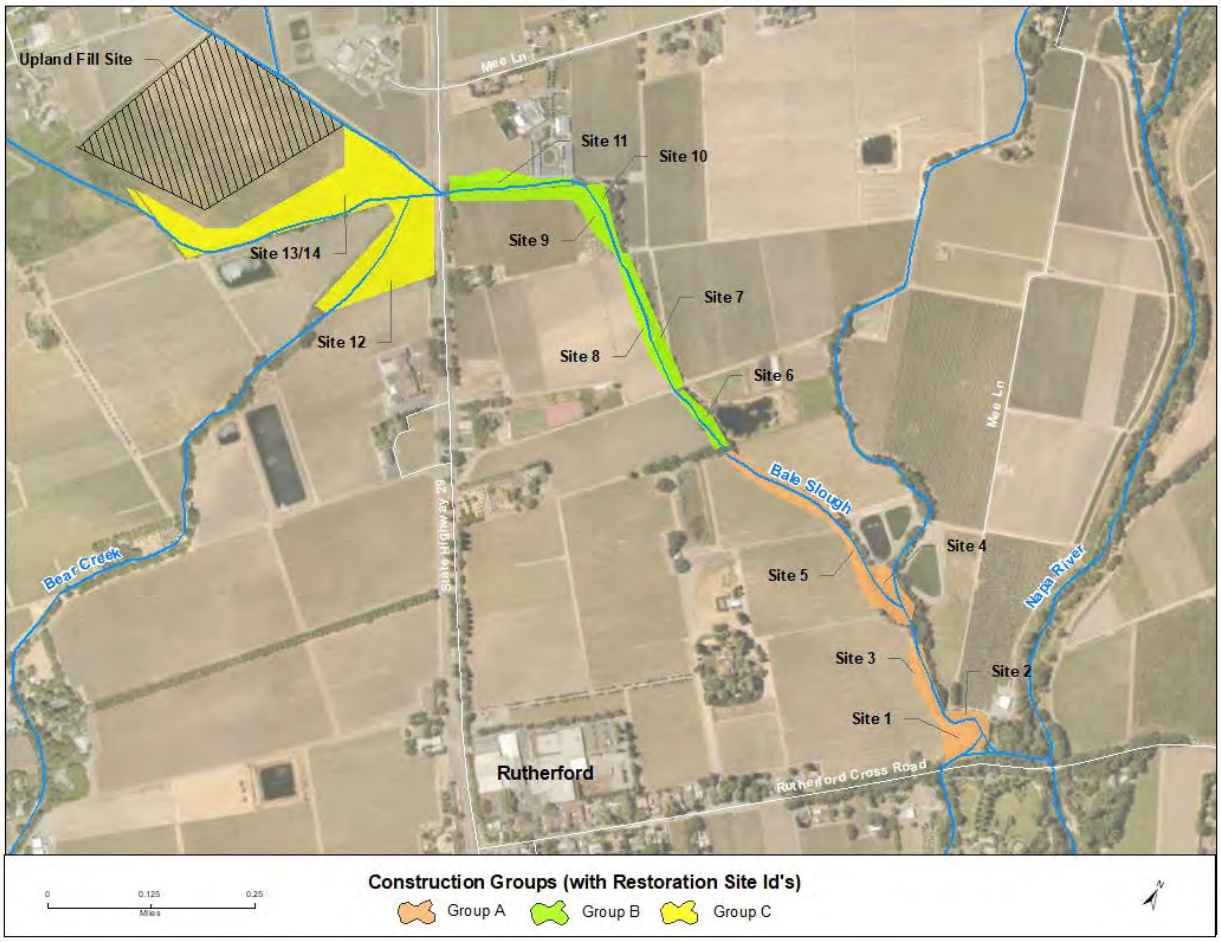


Figure 2 - Project Sites within the Project Area

The following discussion summarizes the main elements of the restoration techniques that will be employed.

Channel Widening

The proposed Project will widen the channel in several locations. Physical habitat-forming processes are currently limited by low width to depth (W:D) ratios. The proposed channel widening activities would increase the W:D ratios of specific Project sites to the extent practicable; on the order of 8:1 to 10:1 depending on lateral constraints and existing environmental resources. Channel widening will enhance the physical processes that sustain aquatic habitat and also allow juvenile fish access to floodplain areas for feeding while increasing the growth and recruitment of riparian tree species vital to the stream ecosystem.

To the extent feasible, existing riparian trees that line the channel and within 1 to 2 feet of proposed grades will be preserved to maintain existing canopy coverage over the channel. Where required, trees and vegetation within the grading limits will be removed and reused in

constructing instream wood structures. All channel widening features would be planted with a mix of transitional riparian and upland species and include large wood structures and willow baffles for habitat complexity and gravel recruitment.

Channel widening will require both mechanical and hand labor. Mechanized equipment such as loaders, scrapers, rollers, compactors, bobcats, and excavators would be used where more extensive grading activities are required and to reconstruct flood berms. Hand grading with trowels, shovels, and other manually operated tools would be employed in sensitive areas to minimize disturbance.

Berm & Bank Setbacks

Berm and bank setbacks reverse the historical pattern of river constriction by relocating berms and banks away from the channel. Existing berms just downstream of Highway 29 will be set back and re-built, to provide a larger channel cross sectional area and higher width to depth ratios.

Floodplain Restoration

Floodplain restoration aims to increase the frequency of Bear Creek inundating its adjacent floodplain areas and thereby enhancing wetland and riparian habitat for migratory birds, amphibians, reptiles, and other terrestrial organisms.

Floodplain restoration includes mass grading and lowering of stream banks to elevations associated with specific flood events. Compared to the widening elements described above, floodplain restoration may involve a larger amount of grading and off-haul. Revegetation is also associated with this design element. All actively graded areas will be revegetated with a suite of native plantings appropriate for the specific hydrologic environment.

The anticipated benefits of floodplain restoration are similar to channel widening. Floodplain restoration results in a larger channel area which will increase gravel deposition and riffle pool habitat in the main channel. Floodplain restoration in the upper portions of the Project will include open areas will be graded to hold water for longer periods after storm events and d provide seasonal wetland habitat for migratory birds, amphibians, reptiles, and other terrestrial organisms.

Biotechnical Stabilization

One of the principal objectives of the Project is to reduce ongoing bank erosion processes, property loss, and subsequent fine sediment loading within the Project reach. Traditional stabilization approaches for minimizing erosion include installation of rock rip-rap, vertical walls, gabions, and other hard structures that provide minimal aquatic habitat value. Biotechnical stabilization utilizes a combination of rock and biodegradable materials to provide

short term structural integrity to resist erosive forces while a matrix of vegetation that provides erosion resistance and habitat becomes established over the longer-term. Biotechnical stabilization measures include planted rock slope protection, coir rolls and erosion control blankets, willow baffles, willow brush mattresses, willow walls, and planting of native poles (willow, cottonwood, etc.).

Where necessary, the proposed Project would include the integration of biotechnical stabilization measures with all channel widening and floodplain restoration elements described above. To the extent possible, existing vegetation will be preserved and incorporated with biotechnical measures to minimize overall habitat and soil disturbance. Where channel widening and floodplain restoration activities are proposed, vegetation will be preserved at the toe of existing channel banks to promote sediment retention and preserve existing trees that provide important canopy cover. Where channel margins are void of existing vegetation and susceptible to erosion, a combination of native pole plantings, coir rolls, willow trenches, and other biodegradable features will be installed.

Instream Habitat Complexity Features

The proposed Project would include installing instream features that provide immediate habitat improvements and initiate geomorphic processes responsible for long-term habitat sustainability.

Large Wood Structures & Large Wood Structure Complexes

An abundant supply of large wood is an integral part of aquatic ecosystems as it influences the morphology, function, and formation of habitat. Channel complexity can be defined as the degree of variability or range of flow depths and velocities encountered along a channel. Complex channels exhibit highly variable topography associated with zones of constrictions (pools) and expansions (riffles) and support a wider diversity of habitats for aquatic organisms. Large wood influences the spatial pattern of scour and deposition to create a diversity of depths and velocities that support a wider range of aquatic habitats. Along the Project reach. juvenile salmonids utilize woody debris features (inundated roots, submerged vegetation, and stems) to feed, avoid predators, and maximize growth.

The proposed Project would install large wood structures to initiate scour, deposition, and sediment segregation to sustain long-term channel complexity. A secondary objective of large wood structures is to increase near-term habitat for juvenile salmonids. The proposed large wood structures would provide immediate increases in available complex habitat for salmonids.

Vegetation Management

The Bale Slough-Bear Creek corridor contains an assemblage of non-native species that reduce riparian habitat complexity, disrupt habitat-forming physical processes, and threaten vineyard health by providing refuge for the blue-green sharpshooter (*Graphocephala atropunctata*). For

example, Vinca (*Catharanthus spp*.) and Himalayan Blackberry (*Rubus armeniacus*) (found in Groups A and B) impede native vegetation establishment and are known hosts for the blue-green sharpshooter. Arundo (*Arundo donax*), found in Group C, out-competes native understory species, confines the channel, and causes localized bank scour.

Vegetation management would include the removal of non-native and exotic species and select removal of native blue-green sharpshooter hosts throughout each Group site. Vegetation management would be conducted as part of clearing and grubbing activities and would be completed before grading commences. Following treatment, these areas will be planted with a native overstory and understory appropriate for local conditions (see Site Revegetation).

Site Revegetation

Revegetation of both under and overstory species appropriate for the restored areas and targeted habitat types would be conducted in all graded and disturbed areas. For example, new floodplains, and widened channel banks would be planted with native species specifically adapted to the sites soil type and expected hydrologic regime. Native plant selection for the purposes of revegetation will focus on mimicking the naturally occurring plant communities found at adjacent reference sites. The planting plan will include a high density of pioneer species designed to quickly establish canopy cover. Table 1 below provides a planting list broken down by planting zones (elevation above active low-flow channel). When fully established, plantings will reduce flow velocities, increase bank stability, provide new sources of large woody debris for recruitment, create high flow refugia for native fish, and enhance habitat for other species that utilize the riparian corridor.

Plant materials would include live, locally harvested cuttings and several sizes of container stock to maximize ultimate survivorship and development of healthy root systems. All materials would be locally sourced and would be obtained from certified native plant nurseries nearby. Some propagules may be salvaged from on-site grading activities that require removal of native vegetation for channel widening.

Typical planting densities will range from 300 to 400 plants per acre and species would be planted in the successional stages that would naturally be established. Microsites will be identified within each restoration area based on elevations and proximity to the stream. Within each microsite or zone a high density of pioneer species adapt to specific environmental conditions will be installed. For example, heat-tolerant species would be planted first, as appropriate, to ensure the highest level of successful establishment. The objective is to quickly establish canopy cover and an ecologically self-sustaining mosaic of habitats. Revegetation sites will be monitored, and later successional species will be integrated to ensure complex and diverse riparian plant community is established over time, which is similar to the species composition to other area in the Napa Valley. Planting activities would take place in the fall, permitting some establishment of new plantings before the onset of high temperatures and

drier conditions in late spring and summer. Site preparation and planting would rely on hand techniques. Irrigation would be installed to support top of bank plantings during the first few years following restoration. The lower planting zones would be watered by hand.

Table 1. Typical Planting Palette for Project

	Habitat Zone A: River Wet Edge (0'- 2' above channel thalweg)
	Biological Name / Common Name
Herbaceous	*Carex barbarae /* Santa Barbara Sedge
	Carex praegracilis / California Field Sedge
	*Juncus balticus /*Baltic Rush
	Juncus effusus var. brunneus / Common Rush
	Habitat Zone B: Lower Floodplain Slope (2' - 6' above channel thalweg)
	Biological Name / Common Name
Trees	*Alnus rhombifolia /* White Alder
	Fraxinus latifolia / Oregon Ash
	Populus fremontii / Fremont's Cottonwood
	Salix laevigata / Red Willow
	Salix lutea / Yellow Willow
Shrubs	*Lonicera involucrata / Twinberry*
	Physocarpus capitatus/ Ninebark
	Rosa californica / California Wild Rose
	Symphoricarpos albus / Snowberry
Herbaceous	*Carex barbarae /* Santa Barbara Sedge
	Carex praegracilis / California Field Sedge
	Eleocharis macrostachya / Common Spike Rush
	*Elymus triticoides /*Creeping Wildrye
	*Juncus balticus /*Baltic Rush
	Juncus effusus var. brunneus / Pacific Rush
	Habitat Zone C: Lower Riparian Slope (6' - 10' above channel thalweg)
	Biological Name / Common Name
Trees	*Acer macrophyllum /* Big Leaf Maple
	Fraxinus latifolia / Oregon Ash
	Populus fremontii / Fremont's Cottonwood
	Salix laevigata / Red Willow
	Quercus agrifolia / Coast Live Oak
	Quercus lobata / Valley Oak
Shrubs	*Lonicera involucrata / Twinberry*
	Calycanthus occidentalis / Western Spice Bush
	Rosa californica / California Wild Rose

	Symphoricarpos albus / Snowberry
Herbaceous	*Carex barbarae* / Santa Barbara Sedge
	Elymus triticoides /Creeping Wildrye
	Euthamia occidentalis / Western Goldenrod
	Bromus carinatus / California Brome
	Lonicera hispidula / Honeysuckle
	Symphyotrichum chilense / Common Aster
Trees	**Habitat Zone D: Upper Riparian Slope (10' + above channel thalweg)**
	Biological Name / Common Name
	Aesculus californica / California Buckeye
	Fraxinus latifolia / Oregon Ash
	Juglans californica / California Black Walnut
	Populus fremontii / Fremont's Cottonwood
	Salix laevigata / Red Willow
	Quercus lobata / Valley Oak
	Quercus agrifolia / Coast Live Oak
Shrubs	*Achillea millefolium* / Yarrow
	Baccharis pilularis / Coyote Bush
	Calycanthus occidentalis / Western Spice Bush
	Heteromeles arbutifolia / Toyon
	Ribes californicum/ California gooseberry
	Rosa californica / California Wild Rose
	Symphoricarpos albus / Snowberry
Vines	*Aristolochia californica*/ Pipe vine
	Lonicera hispidula / Honeysuckle
Herbaceous	*Bromus carinatus* / California Brome
	Carex barbarae / Santa Barbara Sedge
	Elymus glaucus / Blue Wildrye
	Elymus triticoides /Creeping Wildrye
	Festuca idahoensis / Idaho Fescue
	Muhlenbergia rigens / Deergrass
	Symphyotrichum chilense / Common Aster

Scope of Work to Be Completed at Restoration Project Sites

The following summarizes what types of work , as summarized above, would be done at each site (see Figure 2 for the site locations).

Group A Restoration Sites

This area is the downstream portion of the Project reach. It is just upstream of Bale Slough's

confluence with the Napa River. The slough is more entrenched in this section. Widening the channel at Sites 1, 2, and 3 will increase the floodplain width and connectivity, reduce bank erosion, protect adjacent infrastructure, and maintain the mature tree canopy to the extent possible. This will be achieved by grading a gentle, generally 3:1 sloping floodplain on the west side of a large meander in the slough. An island will be graded into the northeast end of the meander to preserve a grove of mature valley oaks (Figure 2). This grading will provide floodplain connectivity via a secondary channel features as well provide high-flow refugia for juvenile salmonids while preserving a significant portion of the existing oak canopy on the western side of the slough. On the outside (east) of this meander, biotechnical bank stabilization measures will be constructed to facilitate and enhance the success of bank planting and to protect an existing vineyard access road. Work at Site 3 will provide a linear expansion of the floodplain. It will create a transitional slope and add top-of-bank revegetation that will include valley and live oaks and an appropriate selection of native understory riparian species.

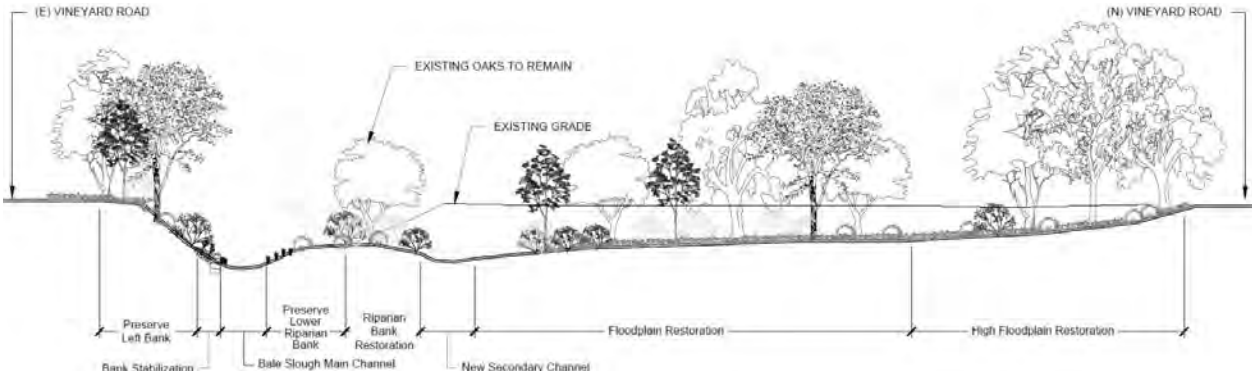


Figure 3 - Conceptual Cross Section with Island

Sites 4 and 5 were originally proposed as generally linear floodplain expansion areas. However, Site 4 has been eliminated from the Project due its proximity to a sensitive cultural resource site. The new Group A channel will create low, frequently flooded habitat within the corridor, which will also promote improved physical processes such as increased coarse sediment recruitment of spawning sized gravels during a range of discharge events. It will also provide a net expansion of the riparian corridor.

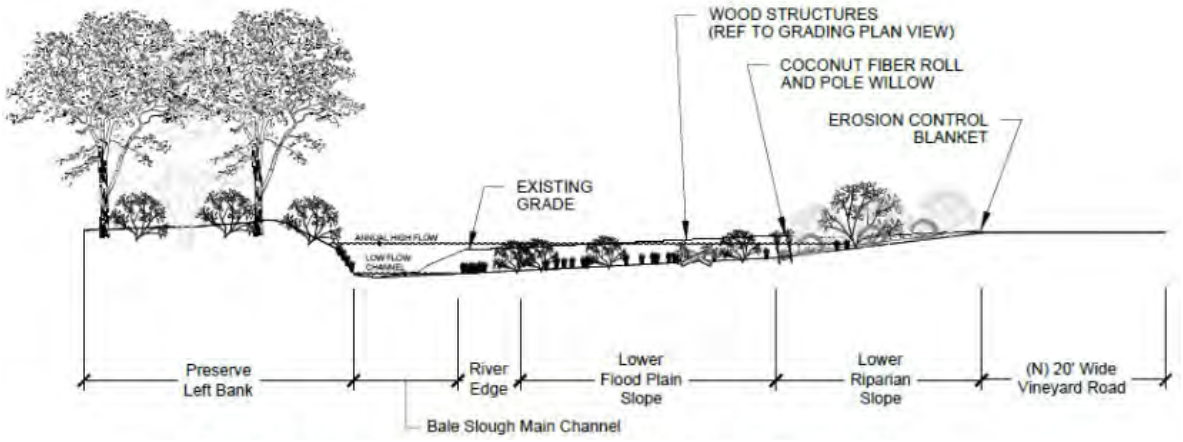


Figure 4 - Typical Channel Cross Section

Group B Restoration Sites

This Group includes Sites 6 through 11. No significant grading will be done at Site 6 or Site 9. Only invasive plant treatment and re-planting of native species will be completed at these sites; the elimination of any grading in these areas is intended to preserve the numerous mature top-of-bank valley oaks at Site 6 and vineyard-related infrastructure (pumps) at Site 9. Sites 7 and 8 will be widened at two locations to increase the hydraulic cross sectional area, encourage sediment deposition, promote subsequent riffle formation, and increase benthic macroinvertebrate production. Site 10 improves floodplain connectivity through floodplain expansion. Site 11 includes agriculture berm setback, floodplain expansion and re-connection. Work at Sites 7, 9, 10, and 11 include the installation of large woody and willow baffle structures, non-native vegetation management, and riparian habitat enhancement. Similar to Group A, erosion control methods will be used in the riparian zone (Figure 3). A bridge located between Sites 6 and 7 will also be replaced and enlarged in order for the stream to convey high flows beneath the bridge, reduce flow obstruction, and correspondingly reduce bank erosion.

Group C Restoration Sites

This group contains Sites 12, 13, and 14. Work at Site 12 will create a passive floodplain enhancement or "zero-stage" area. Restoration actions will include breaching selected sections of an existing agricultural berm by grading inlets to existing low lying areas to increase floodplain interaction and development of a riparian forest floodplain. The increased connectivity will result in a multi-thread wet meadow habitat complex. Along with increasing floodplain connectivity, a large stand of invasive Giant Reed (*Arundo donax*) will be removed.

Sites 13 and 14 have been combined into a single project. Work at these sites will reestablish and formalize a seasonal wetland in an area that historically contained extensive seasonal wetlands and willow complexes. The area will be graded into a series of broad gentle depressions and braided channel geometry, with isolated islands within a seasonally ponded

area. The varied topography and deeper ponding areas will be graded in order to create transitional and seasonal habitat. Large woody structures will be installed. Willows and emergent and submergent wetland native vegetation will be planted at these sites to re-establish a native wetland vegetation assemblage. The grading at these sites will increase temporary floodplain storage and will also result in a small reduction of high flows below Highway 29. In addition to floodplain benefits, the developed seasonal wetland is expected to provide a limited amount of groundwater recharge and extend low flow conditions in Bale Slough further into the summer. Grading within the Group C area involves significant amounts of cut. The excavated soil will be placed on an adjacent property as shown on Figure 2 and in the design drawings in Appendix A. No soil will be off hauled from the Group C area.

Table 2 provides a summary of impact areas with the cut and fill quantities as well the amount of soil expected to be off hauled from each Group area within the Project.

Table 2: Summary of Project Effects

Group	Cut (Cubic yds)	Fill (Cubic yds)	Net Off-haul (Cubic yds)
A	19,225	102	19,123
B	8,900	1,400	7,500
C	34,700	36,510	0

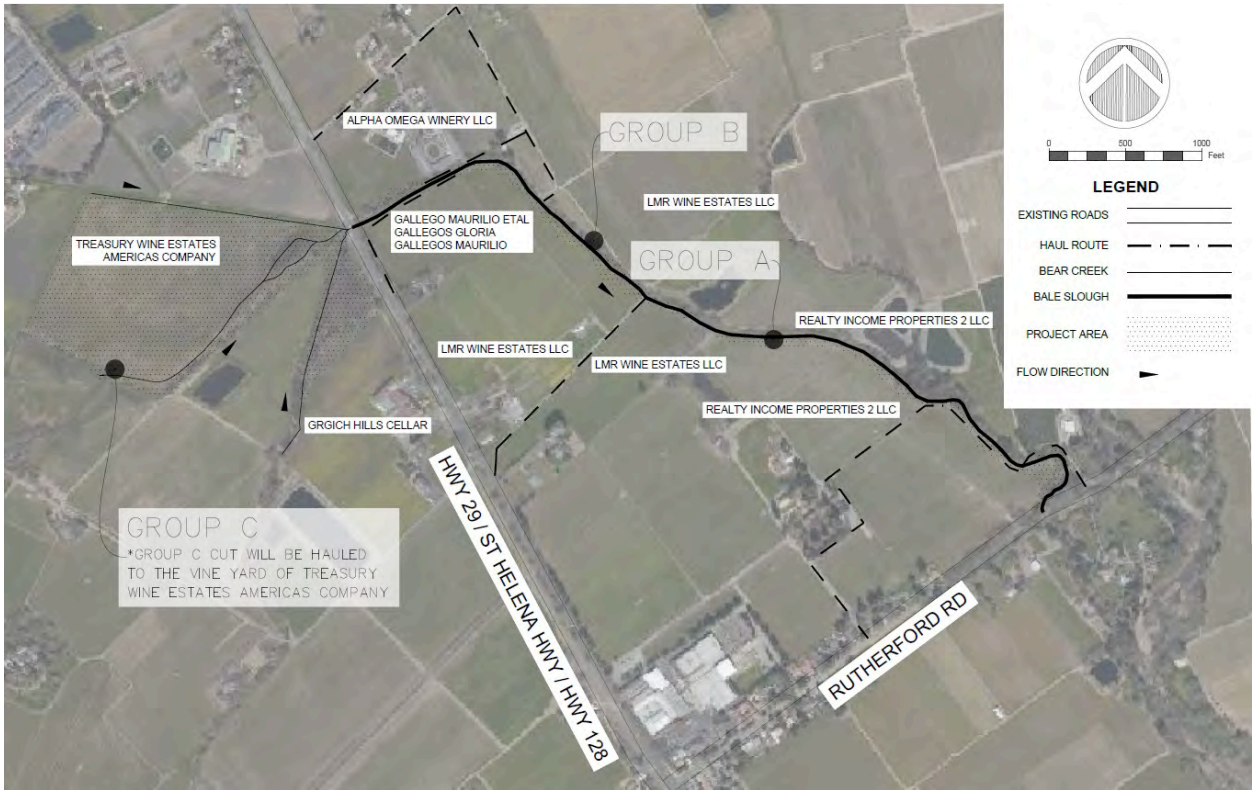
Group	Length of Bank Impacted (ft)	Project area (acres)	Floodplain Enlargement (TOB to TOB; acres)
A	3,112	3.9	1.85
B	2,974	4.6	4.10
C	1,900	37.6	9.13

Construction Access and Haul Routes

Each group area will have different road access points and haul routes for the removal of soil and mobilization. Figure 5 shows these proposed haul routes and access points. The Project will impact an area of 20 acres. Approximately 26,600 cubic yards of soil will be hauled from sites in Groups A and B to Rutherford Road and/or Highway 29 using the haul route(s) indicated on Figure 5.

Approximately 35,000 cubic yards of excavated soil from the lower section of Group C will be delivered to a vineyard of Treasury Wine Estates Americas Company that abuts the new floodplain.

Figure 5 - Site Map and Haul Routes



Tree Removal

Widening the channel in Groups A and B and enlarging the floodplain in Group C will require the removal of 179 trees with a diameter at 5+ inches at breast height. Trees that will be removed on sites in Groups A and B are located on the southern/southwestern bank of Bale Slough and Bear Creek. Table 3 lists the species of tree to be removed and size (diameter in inches at breast height – DBH).

Table 3. Tree Removals

ALDER		**3**		**3**
5-9		2		2
10-14		1		1
ARROYO WILLOW		**3**		**3**
0-4		3		3
BOX ELDER	**1**	**2**		**3**
10-14	1	2		3
COAST LIVE OAK	**1**			**1**
5-9	1			1
COTTONWOOD	**10**			**10**
10-14	1			1
15-19	4			4
20-24	5			5
EUCALYPTUS	**29**			**29**
VALLEY OAK	**15**	**3**	**1**	**19**
5-9	2	1	1	4
10-14	2			2
15-19	3	1		4
20-24	7			7
30-34	1			1
40-44		1		1
WALNUT	**16**			**16**
5-9	3			3
10-14	12			12
15-19	1			1
WILLOW	**26**	**51**	**18**	**95**
0-4		8		8
5-9	4			4
10-14	11	10	18	39
15-19	2	7		9
20-24	9	26		35
Grand Total	**98**	**62**	**19**	**179**

Revegetation

Extensive revegetation tasks will be conducted at most sites. The revegetation plan (see details of the plan in the design drawings in Appendix A) is divided into four zones based on the amount flood inundation each zone receives. The zone designation and species composition that will be planted in that zone are shown in Table 1. Irrigation will be installed as part of the revegetation phase of the Project. Irrigation points of connection will be provided by adjacent vineyard owners, maintenance and monitoring will be the responsibility of the District and landowners.

Construction Phasing

The Project is expected to be constructed in three separate phases. Each Group of sites is expected to be completed during a single summer construction season generally lasting from June 15th to October 15th. Construction may be interrupted during fall so it can be coordinated with the annual grape harvest from the surrounding vineyards.

Construction Timing

At this time, there is no set construction schedule. However, the earliest that the first Group of restoration Sites would be constructed would be summer of 2022 with the completion of the Project in 2024. This schedule is dependent on grant funding.

Environmental Commitments

Project construction would include a range of Environmental Commitments, otherwise known as best management practices (BMPs), designed to avoid and minimize adverse effects on people and the environment. Environmental Commitments are developed to address anticipated effects on particular types of resources from various construction activities. Environmental Commitments are implemented pre-construction, during construction, and post-construction as specified. The Environmental Commitments for the proposed Project are included at the end of this chapter.

Project Monitoring and Adaptive Management

Restored Project areas will be monitored following construction to ensure that each restoration area performs as designed and meets Project objectives. It is likely that the regulatory permits issued for the Project will require monitoring to demonstrate that requirements have been met. A draft Mitigation and Monitoring Plan has been developed for the Project and is included in Appendix F.

Public Involvement

Public disclosure and dialogue are priorities under CEQA. Accordingly, CEQA requires a period during the IS/MND process when interested stakeholders, interested public agencies, or the general public can provide comments on the impacts of the proposed Project. Pursuant to Sections 15073.5 and 15105[b] of the CEQA Guidelines, the District will circulate this document for a 30-day public and agency review. All comments received prior to 5:00 p.m. on the date identified for closure of the public comment period in the Notice of Intent will be considered.

Input, questions, or comments on this Project can be sent to:

Jeremy Sarrow
Napa County Flood Control & Water Conservation District
804 First Street
Napa, CA 94559
Email: jeremy.sarrow@countyofnapa.org

Required Permits and Approvals

Napa County Flood Control & Water Conservation District will be the lead agency under CEQA to review the proposed Project. Prior or to construction, the Project will require permits or approvals from the following Responsible or Trustee Agencies:

1. California Fish & Wildlife will require a 1600 Lake and Streambed Alteration, LSA

2. San Francisco Bay Regional Water Quality Control Board will require a CWA 401 Water Quality Certification, a 402 NPDES. General Construction Permit, and a CWA 402 Aquatics Pesticide General Permit (if pesticides will be applied below the OHWM)

3. The U. S. Army Corps of Engineers (Corps) will require a Nationwide Permit/or Individual Permit under Section 404 of the Clean Water Act for impacts to on-site wetlands.

4. U.S. Fish and Wildlife Service (USFWS) may require an Incidental Take Permit for species listed under the Federal Endangered Species Act that are under their jurisdiction.

5. Caltrans requires Transportation Permits for movement of oversized or excessive load vehicles on state roadways for movement of oversized or excessive load vehicles on state roadways.

6. The County of Napa will require a Grading Permit and a Floodplain Management Permit.

Table 4. Proposed Project Environmental Commitments Table – Bale Slough - Bear Creek Restoration Project

Number	Title	Environmental Commitment Description
General Environmental Commitments These Environmental Commitments will be implemented by the District and its Contractors, as appropriate, for all activities associated with the proposed Project. These Environmental Commitments are grouped according to use of general construction practices, public safety, and reporting procedures. The majority of these Environmental Commitments are implemented prior to and during construction.		
EC-1	Work Windows	All ground-disturbing (e.g., clearing, grubbing, grading, bank stabilization) and in-stream activities (e.g., aquatic habitat enhancements) will take place between June 15 and October 15. Vegetation maintenance outside of the main channel may occur year-round, except when wheeled or tracked equipment needs to access a project site by crossing a creek, ponded area, or secondary channel.
EC-2	Minimize the Area of Disturbance	To minimize impacts to natural resources, soil disturbance will be kept to the minimum footprint necessary to complete the restoration action.
EC-3	Erosion and Sediment Control Measures	All soils disturbed or exposed during construction activities will be seeded and stabilized using erosion control fabric or hydromulch. The channel bed and areas below the Ordinary High Water Mark (OHWM) are exempt from this Environmental Commitments. Erosion control fabrics will consist of natural fibers that will biodegrade over time. No plastic or other non-porous material will be used as part of a permanent erosion control approach. Plastic sheeting may be used to temporarily protect a slope from runoff. Erosion control measures will be installed according to manufacturer's specifications. Appropriate measures include, but are not limited to, the following: • Silt Fences • Straw Bale Barriers • Brush or Rock Filters • Storm Drain Inlet Protection • Sediment Traps • Sediment Basins • Erosion Control Blankets and Mats

Table 4. Proposed Project Environmental Commitments Table – Bale Slough - Bear Creek Restoration Project

Number	Title	Environmental Commitment Description
		• Soil Stabilization (i.e., tackified straw with seed, jute or geotextile blankets, broad cast and hydroseeding, etc.) All temporary construction-related erosion control methods (e.g., silt fences) shall be removed at the completion of each construction season, or as directed by a certified erosion control specialist.
EC-4	Dust Management Controls & Air Quality Protection	The District will implement the Bay Area Air Quality Management District's (BAAQMD) Basic Dust Control Measures (www.baaqmd.gov) at Project sites less than four acres in size. Current measures stipulated by the BAAQMD Guidelines include the following: • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. • All haul trucks transporting soil, sand, or other loose material off-site shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 mph. • All roadways and driveways to be paved shall be completed as soon as possible. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator. • Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.
EC-5	Staging and Stockpiling of Materials	To the extent feasible, staging will occur on access roads, vineyard land, or other disturbed areas that are already compacted and/or designated on the plan set. Similarly, all maintenance equipment and materials (e.g., road rock and project spoil) will be contained within the existing service roads, paved roads, or other pre-determined staging areas. Staging areas for equipment, personnel, vehicle parking, and material storage will be sited as far as possible from major roadways. Stockpiling of materials, including portable equipment, vehicles and supplies (e.g., chemicals), will be restricted to the designated construction staging areas. No runoff from the staging areas may be allowed to enter water ways, including the river channel, tributaries, or storm drains, without being subjected to adequate filtration (e.g., vegetated buffer, hay wattles or bales, silt screens). The discharge of

Table 4. Proposed Project Environmental Commitments Table – Bale Slough - Bear Creek Restoration Project

Number	Title	Environmental Commitment Description
		decant water to waterways from any on-site temporary sediment stockpile or storage areas is prohibited. During the dry season, if stockpiled soils will remain exposed and unworked for more than 7 days then erosion control measures will be utilized. During the wet season, no stockpiled soils will remain exposed, unless surrounded by properly installed and maintained silt fencing or other means of erosion control.
EC-6	Stream Access	Construction access points will be developed in a manner that minimizes impacts according to the following guidelines: • Prior to conducting in-channel work, the District will identify the limits of the required access routes and encroachment into the stream. The District will restrict access routes and encroachment into the stream to the maximum extent while still allowing for necessary activities to be completed. • Access points will be constructed as close to the work area as possible to minimize equipment transport. • Disturbed areas will be revegetated or filled with compacted soil, seeded, and stabilized with erosion control fabric immediately to prevent future erosion. • Personnel will use the appropriate equipment for the job that minimizes impacts. Appropriately-tired vehicles, either tracked or wheeled, will be used depending on the site and maintenance activity.
EC-7	On-Site Hazardous Materials Management	An inventory of all hazardous materials used (and/or expected to be used) at the worksite and the end products that are produced (and/or expected to be produced) after their use will be maintained by the worksite manager. As appropriate, containers will be properly labeled with a "Hazardous Waste" label and hazardous waste will be properly recycled or disposed of off-site. Contact of chemicals with precipitation will be minimized by storing chemicals in watertight containers or in a storage shed (completely enclosed), with appropriate secondary containment to prevent any spillage or leakage. Petroleum products, chemicals, cement, fuels, lubricants, and non-storm drainage water or water contaminated with the aforementioned materials will not contact soil and not be allowed to enter surface waters or the storm drainage system. All toxic materials, including waste disposal containers, will be covered when they are not in use, and located as far away as possible from a direct connection to the storm drainage system or surface water. All trash that is brought to a project site during construction and maintenance activities (e.g., plastic water bottles, plastic lunch bags, cigarettes) will be removed from the site daily.

Table 4. Proposed Project Environmental Commitments Table – Bale Slough - Bear Creek Restoration Project

Number	Title	Environmental Commitment Description
EC-8	Existing Hazardous Materials	If hazardous materials, such as oil, batteries or paint cans, are encountered at the maintenance sites, the District will carefully remove and dispose of them according to the Spill Prevention and Response Plan (see measure EC-9GEN). District staff will wear proper protective gear and store the waste in appropriate hazardous waste containers until it can be disposed at a hazardous waste facility.
EC-9	Spill Prevention and Response	The District will prevent the accidental release of chemicals, fuels, lubricants, and non-storm drainage water into channels following these measures: All field personnel will be appropriately trained in spill prevention, hazardous material control, and cleanup of accidental spills. Equipment and materials for cleanup of spills will be available on site and spills and leaks will be cleaned up immediately and disposed of according to guidelines stated in the Spill Prevention and Response Plan (developed by the Contractor and approved by the District). Field personnel will ensure that hazardous materials are properly handled, and natural resources are protected by all reasonable means. Spill prevention kits will always be in close proximity when using hazardous materials (e.g., at crew trucks and other logical locations). All field personnel will be advised of these locations. District staff will routinely inspect the work site to verify that spill prevention and response measures are properly implemented and maintained. Spill Response Measures: For small spills on impervious surfaces, absorbent materials will be used to remove the spill, rather than hosing it down with water. For small spills on pervious surfaces such as soil, the spill will be excavated and properly disposed rather than burying it. Absorbent materials will be collected and disposed of properly and promptly.
EC-10	Vehicle and Equipment Maintenance	All vehicles and equipment will be kept clean. Excessive build-up of oil and grease will not be accepted. All equipment used for in-channel work will be inspected for leaks each day prior to initiation of work. Action will be taken to prevent or repair leaks, prior to use. Incoming equipment will be checked for leaking oil and fluids. Leaking equipment will not be allowed onsite. No heavy equipment will operate in a live stream (see measure EC-12GEN). No equipment servicing will be done in the channel or immediate floodplain, unless equipment stationed in these locations

Table 4. Proposed Project Environmental Commitments Table – Bale Slough - Bear Creek Restoration Project

Number	Title	Environmental Commitment Description
		cannot be readily relocated (i.e., pumps and generators). If necessary, all servicing of equipment done at the job site will be conducted in a designated, protected area to reduce threats to water quality from vehicle fluid spills. Designated areas will not directly connect to the ground, surface water, or the storm drain system. The service area will be clearly designated with berms, sandbags, or other barriers. Secondary containment, such as a drain pan, to catch spills or leaks will be used when removing or changing fluids. Fluids will be stored in appropriate containers with covers, and properly recycled or disposed of offsite. If emergency repairs are required in the field, only those repairs necessary to move equipment to a more secure location will be conducted in the channel or floodplain. Equipment will be cleaned of any sediment or vegetation before entering the work area to avoid spreading pathogens or exotic/invasive species. Vehicle and equipment washing can occur onsite only as needed to prevent the spread of sediment, pathogens or exotic/invasive species. No runoff from vehicle or equipment washing is allowed to enter water bodies, including channels and storm drains, without being subjected to adequate filtration (e.g., vegetated buffers, hay wattles or bales, and silt screens).
EC-11	Vehicle and Equipment Fueling	No fueling will be done in the channel (top-of-bank to top-of-bank) or immediate floodplain unless equipment stationed in these locations cannot be readily relocated (e.g., pumps and generators). For stationary equipment, secondary containment, such as a drain pan or drop cloth, will be used to prevent accidental spills of fuels from reaching the soil, surface water, or the storm drain system. All non-stationary equipment fueling will be done in staging areas equipped with secondary containment and avoid a direct connection to soil, surface water, or the storm drainage system.
EC-12	Planning for Pedestrians, Traffic Flow, and Safety Measures	Work will be staged and conducted in a manner that maintains two-way traffic flow on public roadways in the vicinity of the work site. If temporary lane closures are necessary, they will be coordinated with the appropriate jurisdictional agency and scheduled to occur outside of peak traffic hours (7:00 – 10:00 a.m. and 3:00 – 6:00 p.m.) to the maximum extent practicable. Any lane closures will include advance warning signage, a detour route and flaggers in both directions. When work is conducted on public roads and may have the potential to affect traffic flow, work will be coordinated with local emergency service providers as necessary to ensure that emergency vehicle access and response is not impeded. • Bicycle and pedestrian facility closures will be scheduled outside of peak traffic hours (7:00 – 10:00 a.m. and 3:00 – 6:00 p.m.) to the maximum extent practicable.

Table 4. Proposed Project Environmental Commitments Table – Bale Slough - Bear Creek Restoration Project

Number	Title	Environmental Commitment Description
		• Public transit access and routes will be maintained in the vicinity of the work site. If public transit will be affected by temporary road closures and require detours, affected transit authorities will be consulted and kept informed of project activities. • Adequate parking will be provided or designated public parking areas will be used for maintenance-related vehicles not in use through the maintenance period. • Access to driveways and private roads will be maintained. If brief periods of maintenance would temporarily block access, property owners will be notified prior to maintenance activities.
EC-13	Public Safety Measures	The District will implement public safety measures during construction as follows: • Signs will be posted at job sites warning the public of construction work and to exercise caution. • If needed, a lane will be temporarily closed to allow for trucks to pull into and out of access points to the work site. • In areas accessible to the public, fencing, either the orange safety type or chain link will be installed around the perimeter of Project sites. • When necessary, District or contracted staff will provide traffic control and site security.
EC-14	Minimize Noise Disturbances to Residential Areas	The District will implement practices that minimize disturbances to residences and commercial winery facilities surrounding work sites. With the exception of emergencies, work will be conducted between the hours of 7:00 a.m. and 7:00 p.m., in accordance with Napa District Code Chapter 8.16. If project terrain or access road conditions require construction equipment to be staged, loaded, or unloaded off the project site (such as on a neighboring road or at the base of a hill), such activities shall only occur between the hours of 8:00 a.m. to 5:00 p.m. Maintenance activities in residential areas and near commercial winery facilities will not occur on Saturdays, Sundays, or County observed holidays except during emergencies, or with approval by the local jurisdiction and advance notification of surrounding residents. Advanced notification will be provided 1 week prior to the start of construction to properties that have residences and/or commercial winery facilities (i.e., tasting room, sales room, restaurant, etc.) within 400 feet of a proposed construction site where heavy equipment will be used. Powered equipment (vehicles, heavy equipment, and hand equipment such as chainsaws) will be equipped with adequate mufflers. Excessive idling of vehicles will be prohibited beyond 5 minutes. Non-power hand tools will be maximized, and noisy equipment will be minimized to the extent feasible at sites in close

Table 4. Proposed Project Environmental Commitments Table – Bale Slough - Bear Creek Restoration Project

Number	Title	Environmental Commitment Description
		proximity to residential structures and commercial winery facilities (80 feet for wineries, 400 feet for residences). These include Sites 4, 7, 9, 15, 16, 17, 18, 19, and 20. Noise complaints will be responded to within 48 hours of receipt, and the District will make a good faith effort to resolve a noise sensitivity issue by constructing noise attenuation shielding or by another acceptable method, where appropriate.
EC-15	Work Site Housekeeping	District employees and contractors will maintain the work site in neat and orderly conditions on a daily basis, and will leave the site in a neat, clean, and orderly condition when work is complete. Slash, sawdust, cuttings, etc. will be removed to clear the site of vegetation debris. As needed, paved access roads and trails will be swept and cleared of any residual vegetation or dirt resulting from the maintenance activity. All lunch trash will be properly disposed of. Materials or equipment left on the site overnight will be stored as inconspicuously as possible and will be neatly arranged.
Biological Resource Environmental Commitments These Environmental Commitments will be implemented as appropriate to avoid and minimize impacts on special-status species and other biological resources. These Environmental Commitments may be modified during project permitting and agency approvals of annual project activities.		
EC-16	Minimize Impacts to Nesting Birds via Site Assessments, Surveys, and Avoidance Measures	For activities occurring between February 15 and August 15, Project areas will be surveyed by a qualified biologist, for nesting birds within 2 weeks prior to starting work. If a lapse in project-related work of 2 weeks or longer occurs, another focused survey will be conducted before project work can be reinitiated. If nesting birds are found, a buffer will be established around the nest and maintained until the young have fledged. Appropriate buffer widths are 0.25 miles for Swainson's Hawks and White-tailed Kite, 300 feet for non-listed raptors, 500 feet for listed passerines, and 150 feet for other birds nesting in trees, shrubs and structures. A qualified biologist may identify an alternative buffer based on a site specific-evaluation and in consultation with CDFW. Work will not commence within the buffer until fledglings are fully mobile and no longer reliant upon the nest or parental care for survival. If a Swainson's Hawk nest is present with a 0.5-mile radius of a Project site, and work will be conducted outside of the 0.25-mile buffer, a biologist will be onsite to monitor the nest for 3 day prior to construction and for the first 3 days of construction. The biologist would look for behavioral changes in Swainson's Hawk activity that would suggest the birds are stressed by construction activity or the nest may be abandoned. Such behaviors may include excessive vocalization, a startled response coincident with a loud noise or changes in the viewshed, or prolonged absence from the nest by adults. After the initial 3-day period, the biologist would visit the site to observe the nest every 3 days until the chick(s) has fledged. If a tree with an active Swainson's Hawk or White-tailed Kite nest is slated for removal, the District will implement Mitigation

Table 4. Proposed Project Environmental Commitments Table – Bale Slough - Bear Creek Restoration Project

Number	Title	Environmental Commitment Description
		Measures BIO-2a and BIO-2b which require and assessment of the nest tree and development of a mitigation plan if removal is proposed. Hand-harvest of vegetation for salvage and other minor work that does not require mechanized equipment (e.g., surveying) may continue during the Swainson's Hawk nesting period throughout the Project area, but not within 500 feet of a nest.
EC-17	Protection of Sensitive Fauna Species from Herbicide Use	A. Approved herbicides and adjuvants may be applied in habitat areas for sensitive wildlife species (including salmonids, foothill yellow-legged frog, California freshwater shrimp); all applications will occur in accordance with federal and state regulations. B. For sprayable or dust formulations: when the air is calm or moving away from sensitive wildlife habitat, applications will commence on the side nearest the habitat and proceed away from the habitat. When air currents are moving toward habitat, applications will not be made within 200 yards by air or 40 yards by ground upwind from occupied habitat. However, these distances may be modified for the control of invasive species if the following measures are implemented: i. A qualified biologist will determine presence/absence of sensitive resources in designated herbicide use areas and develop site-specific control methods (including the use of approved herbicide and surfactants). Proposed herbicide use would be limited to the aquatic formulation of glyphosate (Rodeo or equal). Surfactant would be limited to Agri-dex, Competitor, or another brand name using the same ingredients. ii. A qualified fisheries biologist will review proposed herbicide application methods and stream reaches. The fisheries biologist will conduct a pre-construction survey (and any other appropriate data research) to determine whether the proposed herbicide application is consistent with approvals concerning biological resources and determine which environmental protection measures will be instituted for work to proceed.
EC-18	Protection of Special-Status Amphibian and Reptile Species	A. Prior to commencing construction, a qualified biologist will conduct one daytime non-protocol level survey for special-status reptiles and amphibians including nests, eggs, and tadpoles. The survey will be conducted no more than 48 hours preceding the onset of construction. If no special-status amphibian or reptile is found within the activity area during the pre-activity survey, the work may proceed. B. If a special-status amphibian or reptile, or the eggs or larvae of a special-status amphibian or reptile, is found within the activity area during a pre-construction survey or during project activities, the following measures will be implemented: • If eggs or tadpoles of a special-status species are found, a 100-ft buffer will be established around the location of the eggs/tadpoles and work may proceed outside of the buffer zone. Work within the buffer zone will be rescheduled until the time that eggs have hatched and/or tadpoles have metamorphosed.

Table 4. Proposed Project Environmental Commitments Table – Bale Slough - Bear Creek Restoration Project

Number	Title	Environmental Commitment Description
		• If an active western pond turtle nest is detected within the activity area, a 100-ft buffer around the nest will be established and maintained. The buffer zone will remain in place until the young have left the nest, as determined by a qualified biologist. • If adults or juveniles of a special-status species are found, one of the following two procedures will be implemented: • If, in the opinion of the qualified biologist, the individual is likely to leave the work area on its own volition, and work can be feasibly delayed, a buffer will be established around the location of the individual(s) and work may proceed outside of the buffer zone. No work will occur within the buffer zone until the individual has dispersed. • If, in the opinion of the qualified biologist, capture and removal of the individual to a safe place outside of the work area is likely to result in less impact than leaving the individual in place and delaying the work (e.g., if the species could potentially hide and be missed during a follow-up survey), the individual will be captured and relocated by a qualified biologist (with USFWS and/or CDFW approval, depending on the listing status of the species in question), and work may proceed. C. At the time of inspection, all instream enclosures and adjacent cover along isolated banks will be surveyed for the presence of special status amphibian and reptile species. A qualified biologist will implement measures under Section B (above) as necessary.
EC-19	Protection of Bat Colonies	A. Within two weeks prior to the onset of work activities a qualified biologist will survey the project area to look for evidence of a bat use, including roost trees or structures. If evidence is observed, or if potential roost sites are present in areas where evidence of bat use might not be detectable (such as a tree cavity), an evening survey and/or nocturnal acoustic survey may be used to determine if the bat colony is active and to identify the specific location of the bat colony. B. If an active bat maternity colony is present, then the qualified biologist will make the following determinations: i. Work can proceed without unduly disturbing the bat colony. ii. There is a need for a buffer zone to prevent disturbance to the bat colony, and implementation of the buffer zone will reduce or eliminate the disturbance to an acceptable level. iii. Work cannot proceed without unduly disturbing the bat colony; thus, the work will be postponed until after July 31. C. If a non-breeding bat hibernaculum is found in a tree or structure that must be removed or physically disturbed, the qualified biologist will notify CDFW prior to initiating any removal or exclusion activities.

Table 4. Proposed Project Environmental Commitments Table – Bale Slough - Bear Creek Restoration Project

Number	Title	Environmental Commitment Description
		D. If roosts are determined to be present and must be removed, the bats will be excluded from the roosting site before the facility is removed. A mitigation program addressing compensation, exclusion methods, and roost removal procedures will be developed prior to implementation. Exclusion methods may include use of one-way doors at roost entrances (bats may leave, but not re-enter), or sealing roost entrances when the site can be confirmed to contain no bats. Exclusion efforts may be restricted during periods of sensitive activity (e.g., during hibernation or while females in maternity colonies are nursing young). E. If roosts cannot be avoided or it is determined that construction activities may cause roost abandonment, such activities may not commence until permanent, elevated bat houses have been installed outside of, but near the construction area. Placement and height will be determined by a qualified wildlife biologist, but the height of bat house will be at least 15 feet. Bat houses will be multi-chambered and be purchased or constructed in accordance with CDFW standards. The number of bat houses required will be dependent upon the size and number of colonies found, but at least one bat house will be installed for each pair of bats (if occurring individually), or of sufficient number to accommodate each colony of bats to be relocated.
EC-20	Protection of Mammal Dens	A. No less than 5 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities, a qualified biologist will conduct a survey to determine if bobcat, coyote, gray fox, or mountain lion den sites are potentially present in the work area. If potential dens are found, they will be monitored for activity. If the biologist determines that dens may be active, the District will attempt to preserve the den and maintain an intact dispersal corridor between the den and undisturbed riparian habitat. B. If active dens cannot be avoided, the entrances of the dens will be blocked with soil, sticks, and debris for 3 to 5 days to discourage the use of these dens prior to project disturbance activities. The den entrances will be blocked to an incrementally greater degree over the three to five-day period. After the qualified biologist determines that animals have stopped using active dens, the dens will be hand-excavated with a shovel to prevent re-use during construction. No disturbance of active dens will take place when cubs may be present and dependent on parental care, as determined by a qualified biologist.
EC-21	Avoid and Minimize Impacts to Special-Status Plant Species	A. Surveys of areas identified as suitable habitat for special-status plant species will be conducted by a qualified botanist prior to commencement of work. Surveys will be conducted during the appropriate time of the year to properly identify special-status plants. B. If special-status plants are detected within a construction area or within a 100-foot radius of the construction zone, the District will adjust the construction footprint or establish exclusion fencing to avoid impacts to the plants. Locations of

Table 4. Proposed Project Environmental Commitments Table – Bale Slough - Bear Creek Restoration Project

Number	Title	Environmental Commitment Description
		special-status plant populations will be clearly identified in the field by staking, flagging, or fencing a minimum 100-foot-wide buffer around them prior to the commencement of activities that may cause disturbance. No activity will occur within the buffer area. C. If avoidance is not feasible, then the District will implement measures to minimize the impact to the species. Minimization measures may include transplanting perennial species, seed collection and dispersal for annual species, and other conservation strategies that will protect the viability of the local population. If minimization measures are implemented, monitoring of plant populations will be conducted annually for 5 years to assess the mitigation's effectiveness. The performance standard for the mitigation will be no net reduction in the size or viability of the local population. D. No herbicides will be used in areas identified as potential habitat for special-status plants species, until a qualified botanist has surveyed the area and determined the locations of special-status plant species present. C. The District will not conduct activities that would result in the reduction of a plant species range or compromise the viability of a local population.
EC-22	Protection of fish and other aquatic species during instream construction activities or channel dewatering	Before a work area is dewatered (as identified in EC-12 and EC-13 above) or instream construction activities commence, state and federally listed fish will be captured and relocated to avoid injury and mortality and minimize disturbance. The following guidelines will apply. A. Prior to instream construction (i.e., placement of LWM, boulders, etc.), fish exclosures will be installed using silt fencing, silt curtain, block nets, or similar material to isolate the work area. For any areas to be dewatered, a coffer dam will be installed (see EC-6). B. For projects that involve dewatering of the channel, downstream flows adequate to prevent fish stranding will be maintained at all times during dewatering activities. Pump intakes will be covered by 2.28 mm (3/32 inch) mesh and placed inside a 4x4x4 ft box covered with 6.3 mm (¼ inch) screen to prevent entrainment of fish and amphibians and will be checked periodically for impingement of fish and amphibians. C. Before instream construction commences or a work area is dewatered, the affected area will be surveyed by a qualified fisheries biologist who has a current CDFW scientific collecting permit and USFWS recovery permit and is experienced with capture and handling protocols for state or federally listed fish and aquatic invertebrates. Any state and federally

		listed fish and aquatic invertebrates \ that are encountered will be captured and relocated to avoid injury and mortality and minimize disturbance. D. For sites that will be dewatered, the channel will be blocked by placing fine-meshed nets or screens above and below the work area to prevent state or federally listed fish and aquatic invertebrates from reentering the work area. To minimize entanglement, mesh diameter will not exceed 1/8 inch. The bottom edge of the net or screen will be secured to the channel bed to prevent fish from passing under the screen. Exclusion screening will be placed in low velocity areas to minimize impingement. Screens will be checked periodically and cleaned of debris to permit free flow of water. E. Before removal and relocation begins, a qualified fisheries biologist will identify the most appropriate release location(s). Release locations should have water temperatures similar to (<2°C difference) the capture location and offer ample habitat (e.g., depth, velocity, cover, connectivity) for released fish and aquatic invertebrates, and should be selected to minimize the likelihood of reentering the work area or becoming impinged on exclusion nets or screens. F. The means of capture will depend on the nature of the work site and will be selected by a qualified fisheries biologist. Complex stream habitat may require the use of electrofishing equipment, whereas in outlet pools, aquatic vertebrates and invertebrates may be captured by pumping down the pool and then seining or dipnetting. Electrofishing will be used only as a last resort; if electrofishing is necessary, it will be conducted only by properly trained personnel following the NMFS Guidelines dated June 2000. G. When feasible, initial fish relocation efforts will be performed several days prior to the scheduled start of construction. To the extent feasible, dewatering and species relocation will be performed during morning periods. The fisheries biologist will survey the exclosures or cofferdams throughout the dewatering effort to verify that no state or federally listed fish or aquatic invertebrates are present. Afternoon pumping activities should generally not occur, and pumping should be limited to days when ambient air temperatures are not expected to be high. Air and water temperatures will be measured periodically, and dewatering and species relocation activities will be suspended if temperatures exceed the limits allowed by NMFS guidelines. H. Handling of fish and aquatic invertebrates will be minimized. When handling is necessary, personnel will wet hands or nets before touching them. I. Prior to translocation, any state or federally listed species that are collected during surveys will be temporarily held in cool, aerated, shaded water using a 5-gal container with a lid. Overcrowding in containers will be avoided; at least two containers will be used and no more than 25 fish will be kept in each bucket. Aeration will be provided with a battery-powered external bubbler. Fish will be protected from jostling and noise and will not be removed from the container until the time of release. A thermometer will be placed in each holding container and partial water changes will be conducted as necessary to maintain a stable water temperature. Special-status fish and other special-status aquatic species such as California freshwater shrimp will not be held more than 30 minutes. If water temperature reaches or exceeds NMFS limits, the fish and other aquatic species will be released, and relocation operations will cease.

Table 4. Proposed Project Environmental Commitments Table – Bale Slough - Bear Creek Restoration Project

Number	Title	Environmental Commitment Description
		J. If state or federally listed fish or aquatic invertebrates are abundant, capture will cease periodically to allow release and minimize the time fish spend in holding containers. K. Fish and aquatic invertebrates will not be anesthetized or measured. However, they will be visually identified to species level, and year classes will be estimated and recorded. L. Reports on fish relocation activities will be submitted to CDFW, USFWS, and NMFS in a timely fashion. M. If mortality during relocation exceeds 5%, relocation will cease and CDFW, USFWS, and NMFS will be contacted immediately or as soon as feasible. E. Relocation sites for any captured California freshwater shrimp will be identified prior to initiating removal activities.
EC-23	Site Preparation	A. Prior to the start of work, the contractor will locate and mark all active subsurface utilities in the general vicinity of the site. The contractor will protect all utilities that are to remain in and surrounding the site (including existing piezometers) during onsite excavation and construction activities. Existing piezometers to be demolished or abandoned will need to be done in a manner consistent with local regulations. B. The site will then be cleared and grubbed of surface and subsurface deleterious matter including vegetation, aggregate road-base material and abandoned utilities. These materials will be removed from the site or stockpiled for reuse if approved by the owner in consultation with a qualified geotechnical engineer or geologist. Depressions resulting from the removal of underground obstructions (including tree stumps and root balls) that extend below the proposed finished grades will be cleared and the depressions backfilled with suitable material compacted to the requirements given in EC-28GEO. C. Special attention will be given to site preparation in areas where new berms are planned. Within berm areas, a qualified geotechnical engineer or geologist will observe exposed conditions after vegetation and organic-laden soils are removed but prior to any fill placement to 1) verify the adequacy of stripping; 2) check that suitable soils are exposed. Soils that are loose, weak, highly permeable or otherwise unsuitable will be over excavated under the engineer's direct observation and replaced with engineered material appropriate for berm construction. D. Offsite fill material (if used) will comply with the requirements appropriate its intended use and be evaluated and approved by a qualified geotechnical engineer

EC-24	Fill	A. All proposed fill materials will be approved by a qualified geotechnical engineer or geologist prior to use. The materials excavated from excavated sites may be suitable for re-use as fill, from a geotechnical standpoint, if they meet or can be processed (i.e., by crushing and/or blending) to meet the requirements presented in this section. Material that cannot be mixed or processed to meet specification requirements should be disposed of offsite or stockpiled for other uses at the discretion of the owner. If the re-use of aggregate base or gravel is to be considered, it must first be approved by the owner in consultation with a qualified geotechnical engineer or geologist. B. General Fill: On-site native soil can be used as General Fill, provided it conforms to the requirements presented below: i. Has an organic content of less than 3 percent by volume, ii. Does not contain rocks or lumps larger than 4 inches in greatest dimension, and iii. Has no more than 15 percent of material larger than 2.5 inches. iv. General Fill can be used as engineered fill/backfill except where Berm Core Fill is required.
EC-25	Fill	<u>Subgrade Preparation</u> A. Subgrade surfaces in areas to receive fill will be firm, unyielding, and compacted to the requirements for engineered fill (below). Soft, yielding or otherwise unsuitable subgrade soils will be over-excavated to expose firm non-yielding materials and replaced with appropriately engineered fill. Additional requirements for the preparation of areas to receive fill are presented EC-21, Site Preparation. B. Immediately prior to fill placement, exposed subgrade soils will be scarified to a depth of 6 inches or the full depth of any existing shrinkage cracks. The scarified subgrade soils will then be moisture conditioned to slightly above optimum water content and compacted to at least 90 percent relative compaction based on the ASTM D-1557 test method (latest version). A qualified geotechnical engineer or geologist will observe and test, as appropriate, during subgrade preparation to check that surfaces to receive fill are properly prepared and verify that specified compaction and moisture conditioning requirements are achieved. <u>Engineered Fill Placement</u> A. All fill will be spread in lifts not exceeding 8 inches in uncompacted thickness on surfaces that are approximately level, moisture conditioned, as appropriate, and compacted by mechanical means to the required levels of compaction). It is possible that fill and/or subgrade soils may be excessively wet or dry depending on the moisture content at the time of construction. If the fill soils are too wet, they may be dried by aeration or by mixing with drier materials. If the fill soils are too dry, water will need to be added. B. Required levels of compaction will be as follows (all per ASTM D-1557, latest version): i. Berm Core: at least 90 percent relative compaction I. Plantable Shoulder: at least 85 percent relative compaction II. Roadway Aggregate Base and/or Gravel: at least 95 percent relative compaction III. Other Fill Areas: at least 90 percent relative compaction

		C. A qualified geotechnical engineer or geologist will observe and test, as appropriate, during fill placement to verify that specified compaction and moisture conditioning requirements are achieved. D. Berm Core Fill will be moisture conditioned to about 2 or 3 percent over optimum, as determined by ASTM D-1557 (latest version). Materials comprising the berm core will be approximately uniform and the placement adjacent dissimilar materials will be avoided. The berm core will be compacted in a systematic manner using a sheepsfoot kneading compactor or equivalent equipment. Material that fails the moisture or compaction criteria will be loosened by ripping or scarifying, moisture conditioned, and then recompacted.
EC-26	Berm Surface Drainage	Positive surface drainage will be provided to direct surface water away from slopes. Ponding or collection of surface water will be avoided in any areas adjacent to slopes. The river side of the berm will be designed to sheet flow to and beyond the berm toe. The crest of the berm will either be crowned to split the sheet flow runoff to both side of the berm or the crown will be graded for sheet flow toward the vineyards. Grading plans will account for the swale that will be formed at the toe of the vineyard side of the slope and grade it to drain.
EC-27	Berm Maintenance	Annual inspection and maintenance of constructed berms will be performed late summer to early fall. The berm will be mowed prior to inspection to facilitate observation and repair. Trees or shrubs will not be allowed to grow on the berm and shrubs and saplings will be removed from the crest and river-side slope of the berm. Rodent activity will be monitored, and population control initiated where rodent infestation is observed. Berm damage from tree or shrub removal, erosion, scour, rodent activity, etc. will be repaired to maintain the integrity of the berm.

4.0 Initial Study Checklist

This section documents the anticipated environmental effects of the proposed Project using an Initial Study Checklist and providing a brief explanation supporting the findings of each checklist item.

Evaluation of Environmental Impacts

This Initial Study is based on CEQA's Environmental Checklist Form. Each item on the checklist is answered as either "potentially significant impact," "less than significant with mitigation incorporated," "less than significant," or "no impact" depending on the anticipated level of impact. The checklist is followed by explanatory comments corresponding to each checklist item.

A "no impact" response indicates that it is clear that the Project will not have any impact. In some cases, the explanation to this response may include reference to an adopted plan or map. A "less than significant impact" response indicates that there will be some impact but that the level of impact is insufficiently substantial to be deemed significant. The text explains the rationale for this conclusion. A "less than significant impact with mitigation incorporated" response indicates that there will be a potentially significant impact, but the Initial Study determines there are adequate mitigations, which are described and have been included in the Project, to reduce the level of impact to an insignificant level. Finally, a "potentially significant impact" response would indicate that the Initial Study cannot identify mitigation measures to adequately reduce the impact to a level that is less than significant. In the latter case, an EIR would be required, but no "potentially significant impacts" have been identified for this proposed Project.

Discussion of Environmental Impacts

The proposed Project will have potentially significant impacts in the areas of aesthetics, biological resources, cultural resources, and transportation. All potentially significant impacts identified in this Initial Study can be reduced to a level that is less than significant if mitigation measures recommended in this Initial Study are incorporated into the Project.

I. Aesthetics

This section evaluates the potential changes to the existing visual characteristics of the Project site and vicinity that could result from the proposed Project. The analysis focuses on changes in visual character and effects on views and scenic resources.

Except as provided in Public Resources Code Section 21099, would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?		x		
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				x
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?			x	
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				x

1. Setting

Project Site Description

The Project site is a stream/slough channel and adjacent floodplain that meanders easterly from the upper end of the Project reach until passing beneath Highway 29 and then flowing southeast to the southern end of the Project reach at Rutherford Road. The channel passes through privately-owned vineyards and past a winery as it approached and flows beneath Highway 29. Views of the Project site from the two public roads in the area (Highway 29 and Rutherford Road) are representative of views of the Napa Valley bottomlands, including views of vineyards, wineries, hospitality centers, and agricultural supply facilities.

There are limited views of the Project site from the two public roads that afford any view. From roadside elevations, the only part of the Project site that is visible are the mature trees along the streambanks. From Rutherford Road, views of trees along the Project are possible only as this road approaches the southern end of the slough. Driving east on Rutherford Road from Highway 29, the Project site is not visible because of residences and businesses lining the north side of the road. Approximately 200 yards from the point where Rutherford Road crosses Bale Slough, the buildings end and one can see the line of trees lining Bale Slough bordering the view of vineyards in the foreground. Travelling east, this view of vineyards with the trees in the

background is fleeting as one soon passes over Bale Slough and enters dense vegetation where Bale Slough enters the Napa River. Travelling west on this road provides a similar fleeting view of vineyards in the foreground and midground and the tree line that borders the slough in the background.

Views of the Project site from Highway 29 to the east and the west are often blocked by roadside vegetation and buildings. Mature trees line the highway and are spaced at a somewhat regular distance. People in vehicles travelling north or south can look to the east to see vineyards in the foreground and the tree-lined stream channel in the midground to the background. The Project site trees become more visible as one travels north to where the stream passes beneath the highway. Where views are possible, the views are of trees and vegetation along the streambanks. There are no vantage points where one can see the channel bottom except a momentary view of the channel where the highway crosses over the stream. Traveling south on Highway 29, views of the trees lining the stream to the east of the highway are screened by the Alpha Omega Winery complex. As one passes this winery travelling south, there are views across the vineyards to the trees lining the slough to the east. To the west, one can see trees lining Bear Creek, but they are less dense, not as tall, and less noticeable than the trees lining the slough to the east of the highway.

Most viewers on Highway 29 can see the Project reach at a distance as a component of a broader landscape. Viewed from this perspective, the Project reach appears primarily as a thickly vegetated corridor forming a middle-ground backdrop to vineyards. A limited number of viewers (vineyard property owners and their employees and guests) experience the Project reach from a closer perspective, where it assumes more visual dominance, and individual details of the riparian corridor—structure and species composition—become more important.

Regulatory Framework

The Napa County General Plan identifies aesthetics as one of the important factors contributing to the County's "community character," and includes goals and policies that bear directly on the preservation of aesthetic character and visual resources. Consistent with the General Plan emphasis on aesthetic values, the County's Viewshed Protection Ordinance defines standards and creates guidelines for grading and construction in hillside areas, with the specific aim of protecting views from scenic roadways. Additional General Plan goals and policies protect land uses such as agriculture and open space that contribute to the County's aesthetic character; protect cultural and historic resources, many of which are aesthetically as well as culturally valuable; and provide guidance for preserving dark sky values in rural areas.

The County General Plan identifies over 280 miles of County-designated scenic roadways; however, none have been officially designated as Scenic Highways by the State of California. The General Plan includes a Viewshed Protection Program that contains polices floodplain that are aimed at protecting the County-designated scenic roadways. These policies are primarily focused on ensuring aesthetic compatibility of new development or infrastructure constructed

along these sensitive corridors. In the Project area, Highway 29 and Highway 128 (Rutherford Road) are County-designated scenic roads subject to the Napa County Viewshed Protection Program.

2. Impacts

Except as provided in Public Resources Code Section 21099, would the project:

a. Have a substantial adverse effect on a scenic vista? ***Less than significant*** **with Mitigation Incorporated.**

The Project area does not contain any officially designated scenic vistas. However, the County General Plan identifies scenic beauty as one of the County's most important and characteristic attributes. Therefore, this analysis treats all vistas in the Project area as scenic vistas.

Short-term impacts

Project construction would result in some visual impacts related to vegetation and tree removal, earthwork, and staging. Because the aim of the Project is to maximize habitat value, vegetation removal would be restricted to the minimum required to allow earthwork to proceed, and earthwork would be restricted to the minimum necessary for project success. In addition, construction would be phased over a period of at least three years, so at any given time the extent of visibly disturbed areas from a particular vantage point would be limited. Moreover, the majority of the areas proposed for restoration are located at some distance from the two highways, so the visibility of disturbed areas by the general public would be limited. Nonetheless, because of the importance of visual quality as an aspect of Napa County's unique character, impacts during Project construction could be significant.

Immediately after construction ends, restored areas would still appear somewhat "unfinished" until vegetation fully re-establishes. However, the disturbed appearance associated with construction would not persist, and revegetation in riparian areas would use fast-growing native species such as willows. As a result, creekside work areas are expected to recover to a point where they are no longer conspicuous within about two years following construction. In addition, because work would be phased, some work areas would be substantially recovered by the time ground is broken on the final sites; at any given time, the area in visual recovery would be substantially less than the total Project footprint.

Once, construction is completed, the most noticeable change to views from public vantage points will be the result of reduction in the number of trees lining the Project reach.

Overall, 179 trees (larger than 5-inch in diameter at breast height - DBH) of a total of 445 trees of this size will be removed over about 6,000 linear feet of stream channel.

From vantage points along Rutherford Road, the change in views would be most noticeable for work done at Sites 1-3, which are within 900 feet of the road. At these three sites, which are nearest that road, 59 larger native species of trees (larger than 10-inches DBH) would be removed. The Project includes grading an island at the meander at Site 1, which is nearest the road to preserve a stand of large valley oaks. The Project has been designed to retain as many large trees as possible.

In addition, as described in the previous Setting discussion, Sites 1-3 are visible from a car travelling on Rutherford Road for about one minute as one approaches and passes the slough. The change in views of these three sites is fleeting. The reduction in the number of trees at these three sites would not constitute a "substantial" change in overall views of the area for drivers on this road. Views of a "thinned" tree line would not be particularly noticeable to drivers or passengers driving either east or west. Thinning of trees in the Group B Project area would be less noticeable given the distance from the one stretch on Rutherford Road where views of that area are possible.

Within two years, it is expected that views from Rutherford Road would be of a riparian corridor with many large trees that were preserved and new growth from the restoration planting efforts.

Travelling north on Highway 29, there are several vantage points where drivers and their passengers can see the trees lining Bale Slough to the east and Bear Creek to the west. The tree density will be reduced along approximately 6,000 linear feet of the slough streambank to the east and 2,000 feet of Bear Creek streambank to the west. However, it is 1,200 - 3,000 feet from Highway 29 vantage points to Sites 1-10. It is unlikely that the reduction in trees would be substantially noticeable at this distance. Site 11 is nearer the highway, so construction at this site would be more noticeable. Grading and tree removal at the three sites in Group C located west of the highway would also be more noticeable. The grading changes would be visible for a short time until newly planted vegetation covers the bare soils. The 19 trees to be removed here are smaller and not as visually prominent as the trees in Groups A and B.

Travelling south on Highway 29, there would be similar views as described for travelling north once the vehicle passed the Alpha Omega facility on the east side of the highway. It is noted that drivers travelling on this highway typically are looking up the travel route given typical travel speeds on this heavily travelled highway. It is expected that drivers and passengers are typically looking up the highway or at buildings, roadside trees, and vineyards near the highway. From most vantage points along the highway, one would need to turn one's head to see the trees lining the Project site. Work at Project sites and tree

reduction at those sites would not be particularly noticeable given the distance to work sites and the objective of retaining as many trees as feasible. The visual changes would be most noticeable during construction of Project Site 11 in Group B. After restoration has proceeded for about two years, views would be of a riparian community with many large preserved trees along the streambank and new undergrowth resulting from restoration planting.

The grading at the three Group C sites will result in a multi-thread wet meadow habitat complex. Over time following restoration, natural processes are expected to result in a floodplain-wetland vegetation assemblage at this site. At Sites 13 and 14 work will reestablish a seasonal wetland in an area that historically contained extensive wetlands and willow complexes on an alluvial fan. Broad gentle depressions and braided channel geometry islands with varied topography and deeper ponding areas will be graded in order to create transitional and seasonal habitat. Willow and emergent and submergent wetland native vegetation species will be planted at these sites in order to re-establish a native wetland vegetation assemblage. This work will result in a more visually diverse landscape west of Highway 29 than currently exists.

Because of the comparatively short construction duration, retention of many trees, restoration of the western floodplain, distance of Project sites from public vantage points, and the limited extent of disturbance at any given time, short-term post-construction visual impacts of earthwork and riparian restoration are expected to be less than significant so long as staging and storage during construction are managed to minimize visual impacts within the view of the two public roads. Environmental Commitment EC-5 (see Table 4 in Chapter 3) addresses how the contractor will manage staging and stockpiling of materials to minimize impacts to views and other natural resources. However, additional mitigation is warranted to satisfactorily reduce staging and material storage impacts.

Long-term Impacts

Over the long-term, the appearance of the restored riparian corridor and floodplain will be expected to revert and look like a natural stream corridor and floodplain, and as such, look consistent with the overall mosaic of natural, agricultural, and built views that characterizes the Napa Valley floor. Intermittent maintenance activities (vegetation and bank management) could result in some visual disturbance associated with the presence of personnel and heavy equipment, but the duration and extent of disturbance would be limited and would not be out of character with ongoing activities on nearby agricultural lands. Lasting changes in the appearance of the Project reach as a result of maintenance could include slight alterations in channel appearance as a result of bank stabilization, tree removal, and localized vegetation management. However, all maintenance undertakings would be designed and implemented to ensure riparian corridor functioning and maximize the natural appearance of the river corridor. Consequently, to the extent that the restored

riparian corridor can be seen by the public, most viewers are expected to consider the changes positive. Long-term visual changes associated with the proposed Project would thus represent a less-than-significant impact, and many viewers are expected to consider them beneficial.

To summarize, the only potentially significant visual impact would be a short-term impact during construction. Following construction, the new plantings and other restoration work will mitigate construction impacts. The sites will look consistent with the overall mosaic of natural, agricultural, and built views that characterizes the Napa Valley floor. It is also noted that by the time the third phase begins, sites worked on during first phase will be substantially restored. While views of the site will change, the long-term, effect will be a view of a restored riparian corridor and floodplain. The short-term, impacts of developing this beneficial view of a restored riparian corridor are not sufficiently damaging to be considered "substantial."

Mitigation Measures

Mitigation Measure AES-1: Implement Construction Site Housekeeping Measures and Designate Visual Disturbance Coordinator

In order to avoid or reduce adverse effects related to vegetation removal, earthwork, construction staging, and other Project activities and needs, the District will require all contractors employed on the Project to implement the following measures at all construction sites.

- Project work and staging areas will be maintained in a clean, orderly condition at all times.
- Equipment and materials will be stored in construction staging areas and/or away from public view. To the extent feasible, staging areas will be located away from public view.
- Debris such as excavation spoils and downed vegetation not slated for onsite reuse will be stored away from public view or removed promptly at regular 1-week intervals.

The District will prepare informational signage for the proposed Project, including the name and contact information for a District staff person serving as the designated visual disturbance coordinator. This person, who may be the same staff member designated as noise coordinator, will be responsible for responding to public complaints regarding construction visual disturbance. S/he will be available during regular business hours to monitor and respond to concerns. In the event a visual disturbance complaint is received, s/he will be responsible for determining the cause of the complaint and ensuring that all reasonable measures are implemented to correct the problem.

Mitigation Monitoring and Reporting

The District will be responsible for designating the Visual Disturbance Coordinator and installing the required signing. The contractor's requirements shall be included in the contract and implemented by the contractor. The Visual Disturbance Coordinator will respond to complaints and questions throughout the construction phase.

Impact Significance After Mitigation

As described above, impacts to aesthetics during construction of the proposed Project could be significant. Implementation of Mitigation Measure AES-1 would reduce the temporary visual impacts of Project construction to a less-than-significant level .

b. *Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?* ***No Impact*.**

There are no State scenic highways in the Project area. Highway 29 and Highway 128 (Rutherford Road) are County-designated scenic routes. Consequently, impacts identified in Checklist Item (a) above for scenic vistas in general would also apply to views from scenic highways and other scenic routes. To summarize, visual impacts of construction disturbance could be significant, but would be reduced to the extent feasible by implementation of Mitigation Measure AES-1 above. Permanent impacts would be less than significant, as discussed above, and many viewers are expected to consider the long-term visual outcomes of the Project beneficial. No additional mitigation is required.

c. *In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?* ***Less than significant impact*.**

As identified above, the Project area does not contain any specifically designated scenic vistas, but the previous analysis treated all views in the Project area as scenic vistas with particular importance to the County's community character and quality of life. As a result, the discussion presented in Checklist Item (a) above for scenic vistas also applies to general changes in the visual character of the work sites and their surroundings. To summarize, visual impacts of construction disturbance could be significant, but would be reduced to the extent feasible by implementation of Mitigation Measure AES-1. Long-term impacts would be less than significant, as discussed above, and many viewers are expected to consider the future visual outcomes of the Project beneficial. No additional mitigation is required.

d. *Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?* ***No impact.***

The Project will not involve lighting during construction. Once completed, the Project will be a restored natural landscape, and it will not include lighting. No hard reflective surfaces would be included in the final landscape.

II. Agriculture and Forestry Resources

Would the project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?			x	
b.	Conflict with existing zoning for agricultural use, or a Williamson Act contract?				x
c.	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				x
d.	Result in the loss of forest land or conversion of forest land to non-forest use?				x
e.	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				x

1. Setting

The Project reach passes through several Napa Valley vineyards planted on Farmland as mapped by the Farmland Mapping and Monitoring Program of the California Resources Agency. Many of these vineyards experience flooding during peak storms. While the stream/slough are bordered by trees, including many large oaks, these woodlands are not classified by the State as forestland or timberland.

2. Impacts

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? ***Less than Significant impact.***

Most of the area through which the stream/slough pass are mapped as Farmland. Conversion of Farmland to nonagricultural uses commonly represents a significant impact. The proposed Project focuses exclusively on slough/creek restoration. This restoration

includes expanding the floodplain. The Project engineers estimate that the floodplain would be expanded 1.85 acres in the Group A area, 4.1 acres in the Group B area, and 9.13 acres in the Group C area. This approximate 15-acre floodplain expansion would displace existing vineyards or Farmland soils in the slough/stream corridor. Although it would remove a small area from active cultivation, it would not alter land use designations or farmland classifications at either the local or state level, nor would it create pressure for further conversion of agricultural lands. All Project-related activities would be confined to the corridor immediately along the Bale Slough-Bear Creek Tributary. West of Highway 29, the three Project sites in Group C would be graded to restore the floodplain in that area. Approximately 15 acres of land currently in vineyards and related uses would be converted to riparian corridor and floodplain terraces. The proposed Project would not decrease the value of adjacent lands as an agricultural resource and would likely create a long-term benefit to agriculture by managing flooding more effectively. Soil removed from the Group C sites will be used to improve Farmland on the adjacent vineyard operations to the north. In light of all these factors, impacts related to conversion of agricultural lands are considered less than significant, and no mitigation is required.

b. *Conflict with existing zoning for agricultural use, or a Williamson Act contract?* ***No impact.***

The Project area is designated as AR lands in the Napa County General and is zoned AP. AR designation identifies areas where agriculture is prioritized. AP zoning is applied in areas where agricultural activities are currently taking place and should continue to be the predominant land use.

c. *Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?* ***No impact.***

The Project area is designated as AR lands in the Napa County General and is zoned AP. As discussed above, the AR designation identifies areas where agriculture is prioritized. AP zoning is applied in areas where agricultural activities are currently taking place and should continue to be the predominant land use. The proposed Project focuses exclusively on river and floodplain restoration, and thus is consistent with the open space character of both the AR designation and AP zoning. The Project would not require removal of any Williamson Act properties from contract. Consequently, there would be no conflict with existing land use designations, zoning, or Williamson Act contracts. No mitigation is required.

d. *Result in the loss of forest land or conversion of forest land to non-forest use?* ***No impact.***

The site does not contain forest land, nor would it result in conversion of such land to other uses.

e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use? ***Less than significant impact.***

As identified in (a) and (b) above, the proposed Project focuses exclusively on river and floodplain restoration, and it would not materially alter the existing land use mosaic on the Napa Valley floor. Rather, it would enhance the Valley's existing rural character and contribute to the stability of agricultural uses by improving flood management. Since the Project would not alter the Valley's land use mosaic, there would be no pressure toward farmland conversion as a result of the Project, and no impact related to enabled or accelerated farmland conversion. No mitigation is required.

III. Air Quality

Where available, the significance criteria by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?			X	
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?			x	
c. Expose sensitive receptors to substantial pollutant concentrations?			x	
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			x	

1. Setting

Environmental Setting

Air quality is influenced by the location of air pollutant sources, the rate of emissions from these sources, and meteorological conditions (i.e., wind speed, wind direction, atmospheric stability, air temperature gradients, etc.) and topographic features that influence pollutant movement/dispersal.

The Project site is located in the Napa Valley, which is situated between the Mayacamas Mountains to the west and the Vaca Mountains to the east; it is widest at its southern end and narrows to the north. These mountain ranges serve as effective barriers to the prevailing northwesterly winds. So, pollutants generated in or entering the Valley can become trapped with limited pathways to disperse. During the summer and fall, prevailing winds can transport locally generated air pollutants, as well as non-locally generated pollutants (from the more urbanized areas surrounding the Bay to the south), northward where the valley narrows, effectively concentrating the pollutants there. The local upslope/downslope flows set up by the surrounding mountain ranges also recirculate pollutants and can worsen the total burden to valley receptors. The high frequency of light winds and associated stable atmospheric conditions during the fall and winter contributes to the buildup of pollutants from automobiles, fireplaces/woodstoves, and agricultural burning.

Regulatory Setting

The Federal Clean Air Act and the California Clean Air Act mandate the control and reduction of specific air pollutants. Under these Acts, the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established ambient air quality standards for specific "criteria" pollutants, designed to protect public health and welfare. Primary criteria pollutants include carbon monoxide (CO), reactive organic gases (ROG), nitrogen oxides (NOX), particulate matter (PM10), sulfur dioxide (SO2), and lead (Pb). Secondary criteria pollutants include ozone (O3), and fine particulate matter (PM2.5).

The U.S. EPA administers the National Ambient Air Quality Standards (NAAQS) under the Federal Clean Air Act. EPA sets the NAAQS and determines if areas meet those standards. Violations of ambient air quality standards are based on air pollutant monitoring data and judged for each air pollutant. Areas that do not violate ambient air quality standards are considered to have attained the standard. EPA has classified the region as a nonattainment area for the 8-hour O_3 standard and the 24-hour $PM_{2.5}$ standard. The Bay Area has met the CO standards for over a decade and is classified as an attainment area by the U.S. EPA. The U.S. EPA has deemed the region as attainment/unclassified for all other air pollutants, which include PM10. At the State level, the Bay Area is considered nonattainment for ozone, PM10 and PM2.5.

Regional

The Project site is located within the San Francisco Bay Area Air Basin (Bay Area), where air quality planning and improvement is the responsibility of the Bay Area Air Quality Management District (BAAQMD). The BAAQMD is responsible for implementing emissions controls and other requirements of federal and state laws, and for assuring that the federal and state ambient air quality standards are attained/maintained locally.

The BAAQMD, along with other regional agencies (e.g., ABAG and MTC), develop plans to reduce air pollutant emissions. The BAAQMD's most recent clean air plan is the *Bay Area 2017 Clean Air Plan: Spare the Air, Cool the Climate* (CAP). This update centers on protecting public health and global climate through a broad range of control measures, including specific actions to reduce emissions of air pollutants and greenhouse gases from a broad range of emission sources.

Toxic Air Contaminants

Toxic air contaminants (TACs) are a broad class of compounds known to cause morbidity or mortality. TACs are especially prevalent in the air of urban areas due to the concentrated presence of transportation, industrial, and commercial TAC sources. TACs are regulated at the regional, state, and federal levels.

Diesel exhaust is the predominant airborne TAC in California and is estimated to represent about three quarters of the cancer risk from all ambient TACs. According to the CARB, diesel exhaust is a complex mixture of gases, vapors, and fine particles. Some of the component chemicals in diesel exhaust, such as benzene and formaldehyde, have been separately identified as TACs by the CARB, and are listed carcinogens under California's Proposition 65 and/or the Federal Hazardous Air Pollutants programs.

Sensitive Receptors

The BAAQMD defines sensitive receptors as facilities where sensitive population groups are located, including residences, schools, childcare centers, convalescent homes, and medical facilities. These population groups are considered more sensitive than the general public to poor air quality.

Napa County defines sensitive receptors/land uses as locations where people particularly sensitive to the effects of air pollutants (e.g., children, the elderly, the sick, etc.) are concentrated (e.g., residential areas, schools, hospitals/healthcare facilities, parks/wildlife areas, etc.).

2. Impacts

a. Conflict with or obstruct implementation of the applicable air quality plan? ***Less than significant impact.***

For air quality plan consistency determinations, the BAAQMD recommends that agencies analyze the project with respect to the following questions: (1) does the project support the primary goals of the air quality plan; (2) does the project include applicable control measures from the air quality plan; and (3) does the project not disrupt or hinder implementation of any 2017 CAP control measures? If all the questions are concluded in the affirmative, BAAQMD considers the project consistent with the 2017 CAP.

The Project consists of restoring approximately 8 acres of creekbank area and enlarging the floodplain by approximately 15 acres. After the restoration activity is complete, no new sources of air pollutants would have been installed as part of the project and there will be essentially no net increase in project-related operational emissions.

Consistency of the proposed Project with 2017 CAP is demonstrated by assessing whether the Project includes all applicable 2017 CAP control measures or would hinder implementation of any 2017 CAP control measures. The broad categories of control measures included in the 2017 CAP and the relation of the proposed Project to each such category are as follows:

- **Stationary source control measures** (e.g., controls implemented to reduce emissions from stationary sources like smelting facilities, cement kilns, oil refineries, glass furnaces etc.) – the proposed Project would not include any operational stationary sources or affect the emissions of any existing stationary source in the Bay Area.
- **Transportation and mobile source control measures** (i.e., measures to reduce emissions from motor vehicles by reducing vehicle trips and/or vehicle miles traveled, vehicle idling or traffic congestion) – the proposed Project would restore a slough/stream to improve its habitat value and reduce flooding. Once such restoration is complete, it would not attract new jobs/residents, change VMT or increase traffic-related air pollutant emissions.
- **Land use and local impact control measures** (i.e., to ensure that planned growth is focused to protect people from exposure to air pollution, and to promote mixed-use, compact developments to reduce motor vehicle travel and emissions) – such measures are not specifically applicable to the proposed Project as it consists of one-time restoration activity at an existing creek/slough.
- **Energy and climate control measures** (i.e., to reduce pollutant/CO2 emissions and promote energy conservation/efficiency) – the proposed Project consists of one-time restoration of an existing slough/stream with no new energy-using machinery or buildings.

As presented in the Checklist Item (b) impact discussion below, proposed Project-related construction emissions would not exceed the identified BAAQMD CEQA Guidelines thresholds for significant project-specific emission impacts or for cumulatively considerable contributions to a cumulative air quality impact. As presented in Checklist Item (c) discussion below, the BAAQMD Basic Construction Measures would ensure that the proposed Project would comply with applicable BAAQMD regulations for control of construction-related fugitive dust emissions to less-than-significant levels.

To summarize, the project would not conflict with or obstruct implementation of the Clean Air Plan. Therefore, the Impact would be less than significant, and no additional mitigation is required.

b. *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?* ***Less than significant impact.***

Project-related air quality impacts fall into two categories: short-term impacts due to construction, and long-term impacts due to operation. Once construction of the Project is completed, there will be minimal vehicle trips to monitor the status of restoration. It is possible some additional remedial work will be required, but it is speculative at this time if it

will be required and the extent of any additional constriction. Therefore, this analysis focuses on the short-term construction impacts.

During Project construction, the proposed Project would affect local particulate concentrations primarily due to fugitive dust sources and equipment exhaust. Particulate matter emissions include particulate matter of 10 microns in diameter or less (PM10) and particulate matter of 2.5 microns in diameter or less (PM2.5). Construction equipment exhaust (including both off-road equipment and on-road trucks) would also produce emissions of ozone precursors, including reactive organic gas (ROG) and nitrogen oxides (NOX).

Criteria pollutant and precursor exhaust emissions of ROG, NOx, PM10, and PM2.5 from construction equipment and vehicles would incrementally add to the regional atmospheric loading of these pollutants during the construction period. Impacts related to the proposed Project contributing to an existing or projected air quality violation are judged by comparing estimated direct and indirect proposed Project exhaust emissions to the significance thresholds, which for short-term construction emissions are 54 pounds per day for ROG, NOx, and PM2.5; and 82 pounds per day for PM10. Only the exhaust portion of PM2.5 and PM10 emissions are compared against the construction thresholds.

Tables 5 to 7 summarize the average daily construction-related emissions. Appendix B contains the calculations used to prepare the emissions summary.

As depicted in Tables 5 to 7 construction-related exhaust emissions would be below the BAAQMD construction thresholds, resulting in a less-than-significant impact. However, BAAQMD recommends the implementation of the Basic Construction Measures to reduce fugitive dust emissions. These measures have been incorporated into Environmental Commitment EC-4 as shown in Table 4 in Chapter 3. The impact is less than significant, and no mitigation is required.

Table 5. Project-Related Emissions (lbs./day) for Group A

Emission Source	ROG	NOx	Exhaust PM10	Exhaust PM 2.5
Off-Road Construction Equipment	3.67	35.45	1.57	1.44
Haul Trucks	0.14	7.11	0.04	0.04
Pickup Trucks	0.10	0.08	0.01	0.01
Worker Commute Vehicles	0.01	0.02	0.00	0.00
Total	**3.92**	**42.66**	**1.61**	**1.48**
BAAQMD Construction Threshold	**54**	**54**	**82**	**54**
Significant Impact?	**No**	**No**	**No**	**No**

Appendix D to the User's Guide of CalEEMod (Version 2020.4.0) lists all the numerical values in the model database used to calculate development project criteria pollutant emissions. Diesel-powered construction equipment emission factors from the OFFROAD model and on-road motor vehicle emission rates from EMFAC2017 (the CARB's EPA-approved motor vehicle emission model) for haul trucks, pickup trucks and worker commute vehicles were used along with project-specific equipment type/number and truck/worker commute trips to estimate project construction emissions by Excel spreadsheet.

Table 6. Project-Related Emissions (lbs./day) for Group B

Emission Source	ROG	NOx	Exhaust PM10	Exhaust PM 2.5
Off-Road Construction Equipment	3.44	32.02	1.40	1.29
Haul Trucks	0.03	5.13	0.02	0.02
Pickup Trucks	0.10	0.07	0.01	0.01
Worker Commute Vehicles	0.01	0.02	0.00	0.00
Total	**3.58**	**37.24**	**1.43**	**1.31**
BAAQMD Construction Threshold	**54**	**54**	**82**	**54**
Significant Impact?	**No**	**No**	**No**	**No**

Appendix D to the User's Guide of CalEEMod (Version 2020.4.0) lists all the numerical values in the model database used to calculate development project criteria pollutant emissions. Diesel-powered construction equipment emission factors from the OFFROAD model and on-road motor vehicle emission rates from EMFAC2017 (the CARB's EPA-approved motor vehicle emission model) for haul trucks, pickup trucks and worker commute vehicles were used along with project-specific equipment type/number and truck/worker commute trips to estimate project construction emissions by Excel spreadsheet.

Table 7. Construction-Related Emissions (lbs./day) for Group

Emission Source	ROG	NOx	Exhaust PM10	Exhaust PM 2.5
Off-Road Construction Equipment	5.35	50.94	2.10	1.94
Haul Trucks	0.00	0.00	0.00	0.00
Pickup Trucks	0.10	0.07	0.01	0.01
Worker Commute Vehicles	0.01	0.02	0.00	0.00
Total	**5.46**	**51.03**	**2.11**	**1.95**
BAAQMD Construction Threshold	**54**	**54**	**82**	**54**
Significant Impact?	**No**	**No**	**No**	**No**
Appendix D to the User's Guide of CalEEMod (Version 2020.4.0) lists all the numerical values in the model database used to calculate development project criteria pollutant emissions. Diesel-powered construction equipment emission factors from the OFFROAD model and on-road motor vehicle emission rates from EMFAC2017 (the CARB's EPA-approved motor vehicle emission model) for haul trucks, pickup trucks and worker commute vehicles were used along with project-specific equipment type/number and truck/worker commute trips to estimate project construction emissions by Excel spreadsheet.				

c. *Expose sensitive receptors to substantial pollutant concentrations?* ***Less than significant impact.***

During Project construction, the proposed Project would affect local particulate concentrations primarily due to fugitive dust sources and equipment exhaust. Particulate matter emissions would include PM10 and PM2.5.

To reduce the exposure of local sensitive receptors to PM10 and PM2.5 in the fugitive dust released during Project construction, the BAAQMD Guidelines require that all Bay Area construction projects implement Best Management Practices (BMPs) to control fugitive dust emissions. Thus, the following basic control measures must be implemented by the Project construction contractor:

BAAQMD Required Dust Control Measures: The construction contractor shall reduce construction-related air pollutant emissions by implementing BAAQMD's basic fugitive dust control measures, including:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved surfaces shall be limited to 15 miles per hour.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- A publicly visible sign shall be posted with the telephone number and person to contact regarding dust complaints. This person shall respond and take corrective action with 48 hours. The BAAQMD's phone number shall also be included to ensure compliance with applicable regulations.

These measures have been incorporated into Environmental Commitment EC-4 as shown in Table 4 in Chapter 3. Thus, the Project's fugitive dust impact is less than significant, and no further mitigation is required.

Land use in the Project site vicinity is largely agricultural (i.e., wineries and their surrounding vineyards) with a few scattered rural residential uses and commercial uses (the latter fronting SR-29 and SR-128)

There are approximately 14 residences in the immediate vicinity of the Project site (i.e., within the 1,000-foot-wide belt that the BAAQMD considers the "zone of influence" for an assessment of air quality health risks): 5 on Rutherford Road are within 600-1,000 feet of Site 1 in the Group A section; 3 residences are on Mee Lane within 900-1,000 feet of Site 11 (with 2 of the latter residences on Mee Lane also within 900-1,000 feet of the easternmost portion of the Group C site]; 5 residences north of Group C are within 350-700 feet of the Group C site; and 1 residence on Highway 29 is approximately 900 feet south of Group C.

A screening health risk assessment (HRA) for TAC and particulate exposures to nearby sensitive receptors from Project construction activities was conducted following guidelines established in *Recommended Methods for Screening and Modeling Local Risks and Hazards* (BAAQMD, 2012).

Cancer risk is the probability of developing cancer from a lifetime exposure (i.e., 70 years) to carcinogenic substances. The likelihood of other adverse chronic health impacts unrelated to cancer are measured using a hazard index (HI) defined as the ratio of a project's incremental annual TAC concentration to a published reference exposure level (REL) as determined by OEHHA (which for DPM is 5 µg/m3). Project incremental cancer risks and HI

were estimated by applying established DPM toxicity factors to the construction equipment exhaust DPM concentrations estimated by the SCREEN3 model.

As shown in Table 8, the cancer risks from Project construction DPM at the locations were the annual concentrations of DPM from Project construction activity reach their maxima (according to the SCREEN3 model results) would be <1.0 in each of the 3 years of Project construction, all below the project-level CEQA threshold for cancer risk. The HIs from Project construction DPM would be <0.003, all well below the BAAQMD threshold for chronic hazard. The modeled annual PM2.5 concentrations from Project construction would all be <0.13 µg/m3, all below the Project-level CEQA threshold (0.3 µg/m3).

Table 8 also shows the worst-case construction cancer risk, chronic hazard and PM2.5 increments from the BAAQMD's Permitted Sources Risk and Hazards GIS Map Tool for the five existing stationary sources within the 1000-foot zone-of-influence surrounding the Project construction activity area. Cumulative risk, hazard, and particulate levels (i.e., Project construction levels plus the increments from the five stationary TAC sources within the zone-of-influence) would be below BAAQMD cumulative significance thresholds at all the local sensitive receptor locations.

After it is operational, the Project would not include stationary TAC emission sources nor add any mobile TAC emission sources.

Table 8: Maximum Project and Cumulative TAC Impacts on Sensitive Receptors in the Project Site Vicinity

BAAQMD Source ID	Facility	Address	Cancer Risk	Chronic Hazard Index	PM2.5 Concentration
From Local Permitted Stationary TAC Sources*					
6380	Upper Valley Disposal Service, Inc.	1285 Whitehall Lane, St. Helena	0	0	0.18**
21263	Private Residence	999 Rutherford Cross Road, Rutherford	0	0	0
22901	SWLD LLC C/O CALFOX-Whitehall	1561 South Whitehall Lane, St. Helena	0	0	0
23427	Provenance Vineyards	1695 Saint Helena Highway, St. Helena	0.8	0	0
200514	Colinas Farming Company	990 Rutherford Road, Rutherford	0.2	0	0
From Project Sources***					
Project Construction TAC Impacts (Section A – Year 2022)			0.39	0.01	0.05
Project Construction TAC Impacts (Section B – Year 2023)			0.34	0.01	0.04
Project Construction TAC Impacts (Section C – Year 2024)			0.98	0.03	0.13
Project-Level Significance Thresholds			10	1.0	0.3
Significant Project Construction Impact?			No	No	No
From Cumulative Sources					
Cumulative Sources TAC Impact (Maximum)			1.98	0.03	0.31
Cumulative Significance Thresholds			100	10	0.8
Significant Cumulative Impact?			No	No	No

*The BAAQMD's Permitted Sources Risk and Hazards GIS Map Tool was used to estimate the maximum cancer risk, hazard index, and $PM_{2.5}$ concentration at locations close to the boundaries of each stationary source in the Project site's zone of influence (i.e., within 1000 feet of the Project site boundary).

** The PM2.5 reference level (0.66) for Upper Valley Disposal from the BAAQMD GIS Map Tool was scaled down by a factor of 0.28 to estimate the impact of its particulate emissions at the closest residence at about 600 feet from that facility's boundary.

***Project worst-case construction cancer risk, chronic hazard and $PM_{2.5}$ increments were estimated by the SCREEN3 dispersion model using Project construction equipment TAC emission estimates from the CalEEMod model. Project construction cancer risk, chronic hazard and PM2.5 could be reduced by an additional 50% by requiring that Project construction equipment have retrofitted Level 2 diesel particulate filters, or by an additional 90% by requiring that Project construction equipment have Tier 4 diesel engines.

*d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people**? Less than significant impact**.*

The Project's diesel-powered construction equipment would emit odorous exhaust that has the potential to impact existing local residents. But Project construction activities would be short-term (i.e., during the summer months in each of 3 consecutive years) and most local odor-sensitive receptors (i.e., the few existing rural residences) are at distances greater than a few hundred feet from the loci of creek/wetland restoration activity. Thus, construction odor emissions would not affect a substantial number of people for a substantial time, nor be substantially objectionable to any individual residential receptor while construction is underway. Therefore, this impact would be less than significant.

V. Biological Resources

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

1. Setting

The Project site supports a range of aquatic and terrestrial habitats within the greater Napa River watershed that are potentially affected by restoration activities. General descriptions of these habitat types and the species that commonly utilize them are provided in this section.

Aquatic Habitats

Aquatic habitats in the Project area (Figure 5) include riverine habitat associated with Bale Slough and Bear Creek, as well as some off-channel emergent wetlands. The riverine habitat associated with the Bale Slough is the primary aquatic habitat relevant to Project activities. To a

lesser extent, riverine habitat associated with the Bear Creek and off-channel freshwater wetlands may be affected by Project activities.

Riverine

The portion of Bale Slough - Bear Creek within the Project area is predominantly an alluvial bed channel. The drainage area at Rutherford Road is ~10 mi^2. Stream flow is ephemeral/intermittent throughout the Project area on the valley floor. The upper reaches of Bear Creek contain perennial flow. In the Project area, the river is incised within the valley floor with steep banks. The primary aquatic habitat types in the Project area are glides and shallow pools. Riffles tend to form in portions of the channel that are less entrenched or have a well-developed inset floodplain.

Only a few species of vascular plants typically grow within the riverine habitat. Species that may be found in the stream or below ordinary high water include torrent sedge (*Carex nudata*), and small-fruited bulrush (*Scirpus microcarpus*). Certain non-vascular plants, such as aquatic mosses and filamentous algae that are tightly attached to rocks by strong holdfasts can survive the current but generally dry up in late June through late October. Slow flowing portions of the slough support aquatic vegetation such as cattail (*Typha* spp.), nutsedge (*Cyperus* spp.), and smartweeds (*Polygonum* spp.).

Common, widespread bird species that use habitats in the Project area include raptors, songbirds, and waterfowl. Native amphibians that may be present in and around aquatic habitats in the Project area include Coast Range newt (*Taricha torosa torosa*), and Pacific chorus frog (*Pseudacris regilla*).

Steelhead are relatively widespread in Napa Valley streams, but current abundance is thought to be only a small fraction of historical levels. Fall-/Late Fall-run Chinook Salmon also spawn and rear in the Napa River.

Despite considerable habitat degradation and loss of anadromous fish habitat relative to historical conditions, the Bale Slough watershed still contains spawning and rearing habitat for steelhead and salmon in its upper headwaters. The Napa River watershed is considered one of the most important watersheds in the San Francisco Bay Area for conservation and restoration of the Central California Coast Distinct Population Segment (DPS) of Steelhead (Becker et al. 2007). The Project reach provides seasonal freshwater habitat but cannot sustain fish species year-round. The upper portion of the watershed, Bear Creek, does have suitable salmonid habitat and steelhead (*Oncorhynchus mykiss*) may use the Project reach to access the upper headwaters of the watershed. The salmonid habitat in Bale Slough/Bear Creek was evaluated in 2019 by the Napa County RCD. The Bale Slough channel was reported to have 42% main channel pool/glides, 30% runs, 17% riffles and 11% scour pools (see Figure 6).

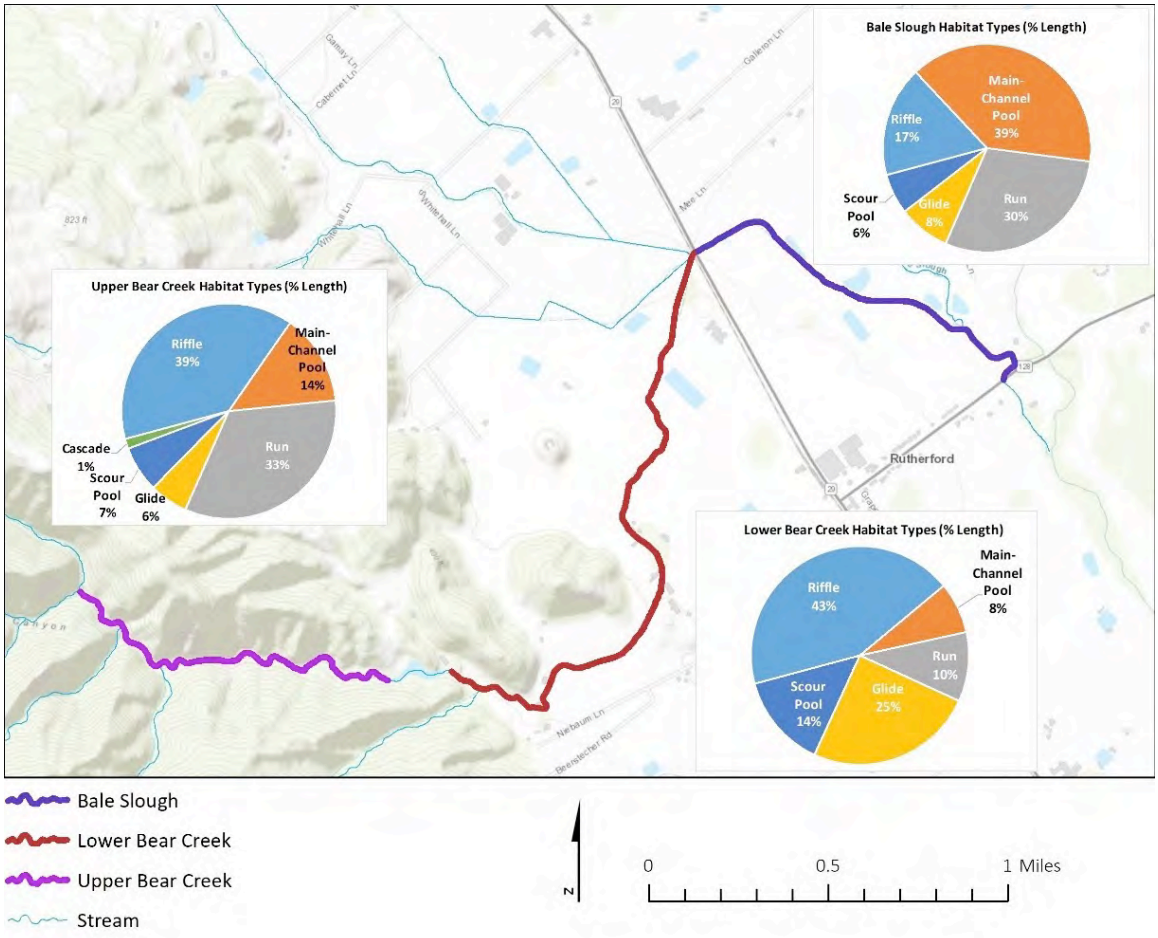


Figure 6 - Bale Slough Project Area. (Napa RCD 3-2019)

The Bear Creek portion of the Project area is dominated by gravel riffles and widely spaced scour pools. Spawning habitat is considered moderate to poor; however, fish are able to pass during periods of high flows into the upper headwaters. Steelhead spawning surveys were completed in 2016, 2017, and 2018. Though favorable conditions existed, no evidence of spawning was observed.

<u>Freshwater Seasonal Wetlands</u>

Freshwater seasonal wetlands occur in the upper Group C project area. The area has been historically used for agriculture but because of the seasonal flooding, much of area has been fallow for the last 15 years. The spatial extent of this seasonal ponding varies based on annual rainfall and runoff. The seasonal wetlands hold water until mid-spring most years. These wetlands are characterized by sedges (*Carex* spp.) and rushes (*Juncus phaeocephalus, J. effuses, J. Balticus*, and several species of downingia (*Downingia* spp.), goldfields (*Lasthenia* spp.), and clover. Figure 7 shows the general area of seasonal ponding and moisture. Using air

photo analysis, from 2008 to 2020 the area varied in size from 2.5 to 1.1 acres with the average being 1.8 acres of seasonally ponded area.



Figure 7. Seasonally Ponded Area in Group C.

Freshwater wetlands, particularly those with native vegetation and high structural complexity, provide high-quality wildlife habitat that offers nesting, foraging, roosting, and cover for a variety of species. The high plant productivity typical of freshwater wetlands offers abundant food sources and cover for wildlife. The wildlife community that receives the most evident benefit from freshwater wetlands is birds. Common and uncommon bird species typically associated with emergent freshwater wetlands that may be found in Napa County include grebes, rails (e.g., Virginia Rail [*Rallus limicola*], American Coot [*Fulica americana*]), herons, egrets, ducks (e.g., Wood Duck [*Aix sponsa*], Cinnamon Teal [*Anas cyanoptera*]), shorebirds, Marsh Wren (*Cistothorus palustris*), and Common Yellowthroat (*Geothlypis trichas*). Amphibians and reptiles that use freshwater wetlands include Pacific chorus frogs, western toads (*Bufo boreas*), and garter snakes (*Thamnophis* spp.), which in turn provide food for other animals including birds and mammals. Mammal visitors to freshwater wetlands include deer mouse (Peromyscus spp.), California meadow vole (*Microtus californicus),* river otter (*Lutra canadensis*), and black-tailed "Mule" deer (*Odocoileus hemionus californicus*). Muskrats (*Ondatra zibethicus*) and beaver (*Castor canadensis*) may use freshwater wetlands for cover, food, and/or hut construction. Many bat species forage for insect prey over wetlands. Freshwater wetlands typically contain many invertebrates—such as dragonflies, craneflies, and snails—that provide an important food source for other species.

Terrestrial Habitats

Riparian

Riparian habitats in the Project reach include valley oak riparian forest, mixed willow riparian forest, and Eucalyptus monoculture. Valley oak riparian forest is the most abundant vegetation community along the lower portion of Bale Slough. This vegetation community is characteristic of the Great Valley Oak Riparian Forest habitat described by Holland (1986)[1] and the Valley Oak–(California Bay–Coast Live Oak–Walnut–Ash) Riparian Forest NFD[2] Association mapped by Thorne et al.[3]. Valley oak (*Quercus lobata*) is dominant, and one of two suites of tree species is sub-dominant: either California bay (*Umbellularia californica*), coast live oak (*Q. agrifolia*), walnut (*Juglans californica var hindsii*) and Oregon ash (*Fraxinus latifolia*), or Fremont cottonwood (*Populus fremontii*) and coast live oak. The understory community in the valley oak riparian forest typically includes species such as Santa Barbara sedge (*Carex barbarae*), arroyo willow (*Salix lasiolepis*), California rose (*Rosa californica*), common snowberry (*Symphoricarpus albus*), California blackberry (*Rubus ursinus*), and wild grape (*Vitus californica*).

Mixed willow riparian forest and riparian scrub habitats include Pacific willow (*Salix lucida ssp. lasiandra*), red willow (*S. laevigata*), narrowleaf or sandbar willow (*S. exigua),* and arroyo willow. These species may be found in pure or mixed stands. Other species commonly found in these habitats include Fremont cottonwood, valley oak, coast live oak, California rose, California blackberry, common snowberry, and white alder (*Alnus rhombifolia*).

Riparian habitats are valuable for wildlife since they provide shade, water, favorable microclimates, and important movement corridors. In-stream woody debris from riparian trees and shrubs also provides important habitat elements, forming scour pools and logjams used by insects, amphibians, and fish. Riparian forests are particularly important for California bird species, providing breeding habitat, over-wintering grounds, migration stopover areas, and movement corridors for bird species with somewhat limited mobility such as California Quail

[1] Holland R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. California Department of Fish and Game. October.

[2] "NFD" indicates that the community was "not formally defined" in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf, 1995).

[3] Thorne, J,H. J. A. Kennedy, J.F. Quinn, And M. McCoy. 2004. A Vegetation Map Of Napa County Using The Manual of California Vegetation Classification And Its Comparison To Other Digital Vegetation Maps. Madrone, Vol. 51, No. 4, Pp. 343–363

(*Callipepla californica*). Multilayered, structurally complex vegetation enhances quality of riparian habitat.

Wildlife associated with riparian habitats include amphibians such as Pacific chorus frog; reptiles such as ring-necked snake (Diadophis punctatus) and sharp-tailed snake (Contia tenuis); birds such Black Phoebe (*Sayornis nigricans*), Yellow-breasted Chat (*Icteria virens*), Bushtit (*Psaltriparus minimus*), Pacific-slope Flycatcher (*Empidonax difficilis*), Orange-crowned Warbler (*Vermivora celata*), and Great-horned Owl (*Bubo virginianus*); and mammals such as black-tailed deer, raccoon (*Procyon lotor*), bobcat (*Lynx rufus*), dusky-footed woodrat (*Neotoma fuscipes fuscipes)*, and shrews (*Sorex spp*.). A variety of bat species may roost in riparian trees including the pallid bat (*Lasiurus blossevillii*), a State species of special concern. Riparian habitat also contributes essential functions to aquatic habitats that support steelhead, Chinook Salmon, and other fish species.

Grasslands and Meadows

Non-native, annual grasslands and sedge meadows occur in undeveloped areas adjacent to riparian habitats. These habitats occur in between the riparian corridor and vineyards. These habitats areas are not commonly flooded by flows from Bale Slough. Vegetation species composition in the grasslands varies throughout the Project reach, with some sites being more diverse than others; however, all sites are dominated by non-native annual grasses.

Sedge meadow habitat occupies shallow swales (Group C area) and topographic depressions within grasslands. Historically, these low-lying areas and swales were inundated on a more frequent basis.

Grassland and meadow habitats provide important wildlife habitat and are generally represented in Group C of the Project area. These habitats provide valuable foraging areas for several bird species. Small, burrowing mammals are abundant in these habitats, and larger mammals such as black-tailed deer often use these habitats for foraging and cover.

2. Impacts

a. Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? **Less than significant with mitigation incorporated.**

For the purposes of this assessment, special-status species are those that are listed as rare, species of concern, candidate, threatened or endangered by the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish

and Wildlife (CDFW)[4], and local experts as documented in the Napa County BDR. [5]Special-status plant and animal species with the potential to occur in the Project area were identified through a review of the following resources:

- U.S. Fish and Wildlife Service (USFWS) List of Federal Endangered and Threatened Species that Occur in or May Be Affected by Projects in Napa County.

- California Natural Diversity Database (CNDDB) Database Query within a 5-mile radius.

- California Native Plant Society (CNPS) Rare Plant Inventory Database Query within a 9-quadrangle area for the Rutherford, Yountville and Napa USGS quadrangles.

- Napa County BDR (Napa County 2005)

- Special status wildlife and plant species with potential to occur within the vicinity of the Project area are presented in Tables 1 and 2 in Appendix C. The potential for special-status species to occur in areas affected by Project activities was evaluated according to the following criteria:

- No Potential: Project activities would not occur in habitat that supports the species. Species considered to have no potential to be affected by Project activities include those associated with salt and brackish marsh, salt ponds, vernal pools, serpentine substrate, broad-leafed upland forest, chaparral, coniferous forest, and cismontane woodland.

- Low: Few of the habitat components meeting the species requirements are present in areas that may be impacted by Project activities. In these instances, the species is not likely to be impacted.

- Moderate: Some of the habitat components meeting the species requirements are present in areas that may be impacted by Project activities.

[4] Includes California Rare Plant Rank (CRPR) listed species.

[5] Napa County. 2005. Napa County Baseline Data Report. Prepared for Napa County Conservation, Development, and Planning Department. Prepared by Jones & Stokes (Oakland and San Francisco, CA) and EDAW (San Francisco, CA).

- High: All of the habitat components meeting the species requirements are present in areas that may be impacted by Project activities.

A discussion of the Project's potential effects on special-status species and the resultant level of impacts are provided below.

Plants

Special-status plant species known to occur in the vicinity of the Project area are listed in Table 1 in Appendix C of this report. These species are either associated with habitats that do not occur in the Project area (e.g., chaparral, serpentine, vernal pools) or the Project area is outside the species' documented range. All but one of the plant species are considered to have no potential to occur in the Project area. All but one of the plant species are considered to have no potential to occur in the Project area.

One plant species, Marsh Checkerbloom, is considered to have low potential to occur in the Project area. Marsh Checkerbloom is generally associated with grasslands, meadows, vernal swales, or freshwater wetlands. The nearest documented occurrence is over seven miles to the north. The only potential suitable habitat would be found in the Group C area of the project site.

Construction activities that involve disturbance of grasslands, meadows, vernal swales, or freshwater wetlands could result in permanent impacts to special-status plants with the potential to occur in the Project area. In accordance with Environmental Condition 21, any construction activity in areas with the potential to support special-status plants would require pre-construction surveys conducted by a qualified botanist during the appropriate blooming time. If special-status plants are observed, measures discussed in EC-21 would be implemented. These measures would reduce construction-related impacts to special-status plants to a level that would be less than significant. Management and maintenance of restoration sites is not expected to impact special-status plant species. Therefore, no mitigation is required.

In the long-term, the proposed Project is not expected to have substantial negative or beneficial effects to special-status plants because few special-status plant species occur in the habitats that are the focus of the Project activities.

Invertebrates

Special-status invertebrates known to occur in the vicinity of the Project area are listed in Table 2 in Appendix C. Special-status invertebrates are considered to have no or low potential to occur in the Project area because suitable habitat is not present, or the Project area is not within the species' documented range. However, if present, measures described

in EC-18 would require a qualified biologist to conduct a habitat assessment prior to initiating construction.

Fish

A primary objective of the proposed Project is to improve habitat for special-status salmonids including steelhead and Chinook Salmon. However, construction activities such as channel widening, which would also include activities such as the construction of flood benches, alcoves, and bank setbacks, could result in temporary impacts to special-status fish species and their habitat. The Project incorporates several measures to minimize potential short-term adverse impacts on special-status fish species, including avoiding the spawning season for salmonid species and determining the best means to bypass flow through the work area to minimize disturbance to the channel and avoid direct mortality of special-status fish. In accordance with EC-22, a qualified biologist would also be present to ensure that fish and other aquatic vertebrates are not stranded during channel dewatering activities and if necessary, relocate individuals in areas slated for construction. With these measures in place, impacts to special-status fish species would be reduced to a less than significant level. Therefore, no mitigation is required.

In the long-term, the proposed Project is expected to have substantial beneficial effects to special-status fish species (particularly salmonids) because the restoration activities would expand and improve the quality of aquatic habitat.

Reptiles and Amphibians

Special-status reptiles and amphibians known to occur in the vicinity of the Project area are listed in Table 2 in Appendix C. Species with the potential to occur in the Project area are discussed below.

Western pond turtle (WPT) is known to occur along the Napa River and has a low potential to occur in the Project area. Western pond turtles could use utilize the aquatic habitats in the Project area for foraging, basking, and mating. Female WPT tend to seek out open areas with sparse, low vegetation (annual grasses and herbs), low slope angle, and dry hard soil for nest sites (USFS 2009)[6]. Restoration sites in the Project area generally provide only marginal nesting habitat for this species because the stream banks are very steep. The

[6] U.S. Forest Service (USFS). 2009. Western Pond Turtle: Species Fact Sheet. Available: www.fs.fed.us/r6/sfpnw/.../sfs-hr-actinemys-marmorata-2009-05.doc Accessed December 26, 2013.

intermittent nature of the creek likely precludes this species from occurring during the work period.

In the long-term, the Proposed Project is expected to have beneficial effects to WPT because the restoration activities would expand and improve the quality of aquatic and upland habitat for WPT.

Foothill yellow-legged frog (FYLF) is a stream breeding ranid frog. Bale Slough provides marginally suitable breeding habitat for this species. Limiting factors for FYLF in the Project area include intermittent flow during the breeding season (typically March through June), high fine sediment loads, and presence of native and non-native predators. FYLF have not been documented on the main stem of Bale Slough but have been documented in Upper Bear Creek outside of the Project area.

Foothill yellow-legged frogs are not likely to occur in the Project area. However, if this species were to occur, construction activities such as vegetation removal, grading and dewatering could result in adverse impacts to this species. EC-18 includes pre-construction surveys for special-status amphibians including FYLF. In the unlikely event FYLF eggs or tadpoles are found, a 100-foot buffer will be established around the location until juveniles disperse from the breeding site, as determined by a qualified biologist (EC-18). If adults are present in the construction area, work would be stopped until individuals are allowed to disperse on their own volition, or the species is relocated by a qualified biologist. With these measures in place, impacts would be reduced be reduced to a less-than-significant level. No mitigation is required.

In the long-term, the proposed Project is not expected to have substantial negative or beneficial effects to FYLF because Project activities are not anticipated to substantially degrade or improve habitat for this species.

California red-legged frog (CRLF) has not been observed in the Napa Valley within the past 100 years. The most recent known records of CRLF are from the early 20th century. Specimens were collected in 1908 and 1910 from Calistoga and "Suscol" (now part of the eastern edge of the City of Napa).[7] They have also been collected two miles southwest of Napa in 1912 and 14 miles west of Monticello Dam in 1963 (University of California, Museum of Vertebrate Zoology).

[7] National Museum of Natural History (NMNH). 2013. NMNH Website: http://collections.nmnh.si.edu/search/herps/. (Accessed May 13, 2013).

Aquatic habitat in the Project area provides only marginally suitable breeding habitat for CRLF. Bale Slough is not likely to support breeding of CRLF because of the flashy hydrology during the breeding season and the intermittent nature of the creek. Off-channel wetlands and vineyard stock ponds are also unlikely to support CRLF breeding because of their isolated position in the landscape (i.e., general lack of suitable dispersal corridors) and the presence of bullfrogs. As a result, they are considered unlikely to be present at this time. At best, aquatic and riparian habitat associated with the Bale Slough would function as dispersal habitat for CRLF in the unlikely event the species is present in the Project area. However, if this species were to occur, construction activities such as vegetation removal, grading and dewatering could result in adverse impacts to this species. EC-18 includes pre-construction surveys for special-status amphibians including CRLF. In the unlikely event CRLF eggs or tadpoles are found, a 100-foot buffer will be established around the location until juveniles disperse from the breeding site, as determined by a qualified biologist (EC-18). If adults are present in the construction area, work would be stopped until individuals are allowed to disperse on their own volition, or the species is relocated by a qualified biologist with permission to handle CRLF. With these measures in place, impacts would be reduced be reduced to a less than significant level. No mitigation is required.

Birds

Special-status bird species known to occur in the vicinity of the Project area are listed in Table 2 in Appendix C. Species with the potential to occur in the Project area are discussed below.

Swainson's Hawk (SWHA). In 2013, a nesting pair of SWHAs was observed in the Rutherford Reach of the Napa River, immediately downstream of the Project area. Suitable nesting habitat is present in the Project area, and this species is considered to have a moderate potential to occur. The Project area provides marginal to low quality foraging habitat for SWHA. If present, temporary construction-related activity could generate noise and visual distractions that could disturb SWHA and potentially cause failure of a nest, which would be considered a significant impact. Removal of nest trees outside of the nesting season would also be considered a potentially significant impact because of the species' high fidelity to breeding sites. [8]

White-tailed Kite is a State Fully Protected species. Suitable nesting and foraging habitat are present in the Project area and nesting is known within the Napa River Ecological Reserve. If present, temporary construction-related activity could generate noise and visual

[8] Woodbridge, B. 1998. Swainson's Hawk (Buteo swainsoni). In The Riparian Bird CNational Museum of Natural History (NMNH). 2013. NMNH Website: http://collections.nmnh.si.edu/search/herps/. (Accessed May 13, 2013).

distractions that could disturb nesting and potentially cause failure of a nest, which would be considered a potentially significant impact.

The proposed Project incorporates measures to avoid and minimize impacts to SWHA and White-tailed Kite. EC-16 includes pre-construction protocol-level surveys for SWHA. In the event that an active nest is found during surveys, a minimum of 0.25-mile no work buffer will be established around the SWHA or White-tailed Kite nest until the young have fledged or the nest becomes inactive. These measures would minimize impacts to SWHA and White-tailed Kite. However, impacts could remain potentially significant if known nest trees are removed. Mitigation Measures BIO-1a and BIO-1b will reduce the potential impacts to SWHA and White-tailed Kite to a level that is less than significant by assessing the impacts of nest tree removal and mitigating these impacts accordingly.

Mitigation Measures

Mitigation Measure BIO-1a: Assess Impacts of Removing Special-Status Raptor Nest Trees

If during site surveys, a known nest tree of a special-status raptor (e.g., Swainson's Hawk, and White-tailed Kite) is located within a restoration site and is planned for removal, a qualified CDFW-approved biologist will conduct an assessment of the nest tree. The assessment will evaluate the importance of preserving the nest tree by evaluating factors such as nest site success, site fidelity, nest integrity, raptor density/competition, predator pressure, and the tree's structure relative to surrounding habitat. If the biologist determines that removal of the nest tree cannot be sufficiently mitigated, then the District will redesign the proposed Project to avoid removal of the nest tree. If the biologist determines that mitigation is feasible, the District will implement Mitigation Measure BIO-2b.

Mitigation Measure BIO-1b: Develop and Implement a Mitigation Plan for Removal of Special-Status Raptor Nest Trees

If removal of a special-status raptor nest tree is proposed, the District will develop a plan to mitigate for the loss of the nest tree. At minimum the mitigation plan will include replanting of species with similar structure to the nest tree at a 5:1 ratio and within 1,000 feet of the nest site. If replacement planting is implemented, monitoring will be conducted annually for 5 years to assess the mitigation's effectiveness. The performance standard for the mitigation will be 65% survival of replacement plantings. The mitigation plan may also include preservation of other trees with similar structure to the nest tree and in close proximity to the nest site. Prior to removing a nest tree, the mitigation plan shall be submitted to CDFW for approval. CDFW will have authority to reject the mitigation plan and require that the nest tree be preserved if CDFW finds the mitigation to be inadequate. If known nesting trees of special-status raptors are removed it will take place outside of the raptor nesting season.

Mitigation Monitoring and Reporting

The qualified biologist will develop a mitigation plan prior to grading or tree removal within one-quarter mile of the nest site. If the biologist determines that mitigation is infeasible and the nest tree needs to be removed, the tree removal mitigation plan shall be submitted for CDFW review prior to work within one-quarter mile of the next tree. Final mitigation will follow CDFW recommendations after their review of the mitigation plan.

Impact Significance After Mitigation

The nest tree will be protected from removal or removed per the mitigation plan. This would reduce the impact to a less-than-significant level. In the long-term, the proposed Project is expected to have beneficial effects to SWHA and White-tailed Kite because the restoration activities would increase the extent of riparian habitat which provides suitable nesting habitat for SWHA and White-tailed Kite.

Mammals

The Project area provides suitable habitat for special-status bat species including pallid bat (*Antrozous pallidus*), and Townsend's big-eared bat (ˆ). These bat species may utilize structures in the vicinity of the Project area or hollow trees within the restoration sites as roosts or maternal colonies. Adjacent vineyards provide high quality foraging habitat. Removal of trees or structures with an active maternity colony or roost of special-status bat species would be considered a potentially significant impact.

Environmental Condition EC-19 specifies measures which would avoid or minimize impacts to special-status bat species. These measures include pre-construction surveys for roost sites, methods to minimize impacts to active roosts during construction, and protocols to mitigate for unavoidable impacts to special-status bats. With the implementation of these measures, impacts to special-status mammals would be reduced to a less than significant level. Therefore, no additional mitigation is required.

In the long-term, the proposed Project is not expected to have substantial negative or beneficial effects to special-status bats because Project activities are not anticipated to substantially degrade habitat for these species.

b. Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? **Less than significant with mitigation incorporated.**

Sensitive natural communities that would be affected by the proposed Project include various wetland, upland and riparian habitats. Wetlands are addressed separately in Section

(c) below. Implementing channel widening, floodplain restoration, biotechnical stabilization, in-stream habitat structures, grading fill area, and vegetation management would impact approximately 46.8 acres, of that total 4.9acres is riparian or seasonal wetlands and 43.9 acres is upland habitat that is either fallow or cultivated. The project will increase riparian and seasonal wetland areas to 15.1 acres. Approximately 179 trees over 5 inches diameter at breast height (DBH) would be removed, many of them native species (see Table 3.

Currently, riparian habitat in the Project area is dominated by relatively even-age stands of mature riparian forest. Due to the geomorphic condition of the slough/creek, these habitats are relatively static with little opportunity for natural disturbance and recruitment, except for severe bank erosion, which takes a very long time to recruit riparian habitat under natural conditions. The proposed Project would restore floodplain function at select restoration sites. This would enable creation of early seral riparian habitat that is prone to natural disturbance by flooding. This habitat type is severely underrepresented Napa Valley and was historically much more prevalent prior to widespread channel incision. These types of early seral, scrub/shrub dominated habitat, along with the expanded riparian corridor, would provide important habitat for riparian obligate passerine species. Early- and mid-seral riparian habitats will also provide habitat heterogeneity and "patchiness" along the riparian corridor which is likely to increase species diversity.

Nevertheless, the proposed Project's impact to riparian habitat would be considered "long-term" because the impacts would persist for greater than one year. The proposed Project would offset these impacts by restoring approximately 14.5 acres of riparian and 2.95 acres of upland habitat for a total of 17.55 acres of restored habitat. This includes conversion of approximately 3.1 acres of vineyards to natural areas, much of which would be restored to riparian habitat and floodplain habitat. Approximately, 14.5 acres would be new "lowered" floodplain habitat or seasonal ponding areas that would experience a greater frequency of inundation and overall floodplain connectivity. Revegetation of both understory and overstory species would be conducted in all graded and disturbed areas as well as where vegetation management is prescribed. Microsites will be identified within each restoration site based on elevations and proximity to the stream. Within each microsite or zone, a high density of pioneer species adapted to the specific environmental conditions will be installed. For example, new floodplains, benches and widened channel banks would be planted with native species specifically adapted to the soil type and expected hydrologic regime. The revegetation effort aims to quickly establish canopy cover through the planting of pioneer species at a high density throughout the Project. When established, plantings will reduce flow velocities, increase bank stability, provide new sources of large woody debris, create high flow refugia for native fish, and enhance habitat for other species that utilize the riparian corridor.

Over the long term, Project maintenance could require pruning, thinning, limited removal of trees and riparian vegetation, and grading and bank stabilization for managed streambank

retreat. Any such activities would be restricted to the minimum necessary to maintain the functions of the channel and constructed project features and would incorporate the same Environmental Commitments to protect special-status species as is required during Project construction. Over the long term, the Project would have a beneficial effect on riparian habitats. However, impacts due to removal of vegetation during construction or maintenance activities would result in a long-term (more than one year) loss of certain riparian functions and values of riparian habitat, which would be potentially significant. The conversion of approximately 3.1 acres of vineyards to natural areas would partially offset this impact.

Mitigation Measures

Mitigation Measure BIO-2a: Document Riparian Habitat Impacts and Identify Preservation and Salvage Opportunities

Prior to and following each construction season, the District shall document the extent of riparian habitat that would be disturbed in the Project area during construction. Disturbance of riparian habitat shall be defined as a reduction of absolute coverage by 30% or greater in the tree or shrub stratum. Removal of riparian habitat dominated by Himalayan blackberry (with no overstory) and Arundo will not be counted as removal of riparian habitat. During pre-construction surveys the District will identify opportunities for plant salvage (e.g., Santa Barbara sedge) and transplant species to restoration sites. A qualified biologist will survey the limits of grading and identify opportunities for preservation of riparian habitat. The District shall submit annual reports to CDFW documenting the extent of disturbance and preservation measures.

Mitigation Measure BIO-2b: Restore and Monitor Riparian Habitat

For each acre of riparian habitat that is disturbed in the Project area, the District shall restore 2 acres of habitat within 10 years following construction. Restored habitat shall contain a minimum absolute coverage of 60% in the tree stratum and 30% cover in the shrub stratum within 10 years. The restored habitat shall contain a minimum of three native woody vines, shrubs or trees species that individually account for at least 10% cover. Remedial actions, such as replanting, will be implemented to ensure that the cover objectives are met. The District shall submit annual reports for 10 years to CDFW documenting the extent of riparian habitat restored.

Mitigation Monitoring and Reporting

Prior to and following each construction season, the District shall document the extent of riparian habitat that would be disturbed in the Project area during construction. During pre-construction surveys the District will identify opportunities for plant salvage and transplant species to restoration sites. A qualified biologist will survey the limits of grading and identify

opportunities for preservation of riparian habitat. The District shall submit annual reports to CDFW documenting the extent of disturbance and preservation measures.

For each acre of riparian habitat that is disturbed in the Project area, the District shall restore 2 acres of habitat within 10 years following construction. The District shall submit annual reports for 10 years to CDFW documenting the extent of riparian habitat restored

Impact Significance After Mitigation

Implementation of Mitigation Measures BIO-2a and BIO-2b would reduce impacts to riparian habitat to a level that is less than significant by surveying pre-Project conditions, avoiding impacts where feasible, and creating an additional 50% of restored riparian and seasonal ponding habitat.

c. *Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?* **Less than significant Impact.**

Construction of flood benches, and in-stream habitat features (e.g., large wood structures, grade control, roughness boulders) would result in excavation and placement of fill in jurisdictional waters of the U.S. and removal of vegetation within areas that are potentially jurisdictional wetlands. Project activities are not expected to result in loss of waters or wetlands, nor conversion of wetland type.

Following construction, recontoured banks and inset terrace/floodplain surfaces would be replanted with native overstory and understory riparian species, eventually replacing and improving the functions and values currently offered by the mixed native and non-native vegetation in existing in-channel wetlands. Creation of new inset surfaces below the Ordinary High Water Mark would also facilitate sediment deposition and trapping of native seed material and natural recruitment of riparian vegetation, potentially increasing the extent and stability of in-channel and channel-marginal wetland areas. Although some wetland areas would be temporarily disturbed or removed during Project construction, the Project is expected to benefit wetlands overall by increasing their extent, as well as improving functions and values.

Over the long term, Project maintenance could result in disturbance or removal of wetland vegetation. However, as discussed above, any removal of wetland vegetation would be restricted to the minimum necessary to maintain the functionality of the channel and the constructed project features and would incorporate the Environmental Commitments to protect special-status species required during project construction. Over the long term, the Project would have a beneficial effect on wetlands. Temporary impacts due to removal of vegetation during construction or maintenance activities are expected to have a less-than-

significant impact to federally protected wetlands. No additional mitigation beyond the Environmental Commitments is required.

d. *Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?* **Less than significant impact**

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation; they may be continuous habitat or discrete habitat islands that function as steppingstones for wildlife dispersal.

The Project site is not recognized as an important wildlife corridor by any regional or State agency or jurisdiction and is not considered critical to the ecological functioning of adjoining open space areas. However, because the Project site is a linear feature that includes a substantial length of Bale Slough-Bear Creek, it does provide value as a corridor that supports movement between similar patches of habitat within the valley floor, and forested areas to the west of the Project area. It likely supports local movement patterns of aquatic and riparian species and provides food and cover resources for common and some special-status avian and amphibian species. Temporary effects due to noise and increased human activity during Project activities would not interfere with these local movement patterns over time or affect the ability of these species to forage or reproduce.

Project construction and maintenance would incorporate a variety of measures to avoid or minimize adverse effects to movement and reproduction of fish and wildlife resources. Specifically, the proposed Project incorporates seasonal restrictions on most activities to avoid sensitive migration and breeding times. For activities that do occur during the breeding season for migratory species, pre-construction surveys are required to identify nest sites and subsequently minimize disturbance to active nests or breeding sites (EC-16 and EC-20). These measures will reduce wildlife movement-related impacts to fish, amphibians, reptiles, and birds to a level that is considered to be less than significant.

e. *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?* **Less than significant impact**.

There are no known Habitat Conservation Plans, Natural Community Conservation Plans, or other approved local, regional, or state Habitat Conservation Plans that would pertain to the proposed Project area.

The County General Plan contains numerous goals, policies, and action items to protect biological resources. The proposed Project incorporates a variety of measures to avoid or

minimize adverse effects to sensitive habitats, wildlife, and fisheries resources. Additionally, in-channel and riparian habitat and stream-dependent wildlife would benefit from the Project over the long-term. Therefore, the Project is consistent with the General Plan's priority on conservation of biological resources, and there would be no impact related to conflicts with local policies or ordinances for biological protection. No mitigation is required.

V. Cultural Resources and Tribal Cultural Resources

Would the project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?		x		
b.	Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?		x		
c.	Disturb any human remains, including those interred outside of dedicated cemeteries?		x		
d.	Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place or object with cultural value to a California Native American tribe, and that is:				
(i)	Listed or eligible for listing in the Caltrans Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or		x		
(ii)	A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.		x		

1. Setting

The following summarizes the archaeological setting of the site and the impact analysis described in detail in the Historic Property Survey Finding of Effect report prepared by Basin Research Associates contained Appendix D of this Initial Study.

Regulatory Setting

Under CEQA, cultural resources that will be affected by an undertaking must be evaluated to determine their eligibility for listing in the CRHR (PRC Section 5024.1(c)). For a cultural resource to be deemed eligible for listing, it must meet at least one of the following criteria:

1. is associated with events that have made a significant contribution to the broad patterns of California History and cultural heritage; or

is associated with the lives of persons important to our past; or

embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possess high artistic value; or

has yielded or is likely to yield, information important to prehistory or history.

The Area of Potential Effects (APE) for Archaeology includes the area within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, should any be present within the APE. The Bale Slough-Bear Creek Tributary Restoration Project horizontal and vertical APE consists of the proposed restoration elements including channel widening, floodplain restoration, biotechnical bank stabilization, in-stream habitat features, and other improvements associated with improving salmonid and riparian habitat within the project alignment.

The eligibility of archaeological sites is usually evaluated under Criterion 4 –its potential to yield information important to prehistory or history. Whether or not a site is considered important is determined by the capacity of the site to address pertinent local and regional research themes. The process for considering cultural resources on CEQA projects is essentially linear, although in practice it may overlap or be compressed. Evaluating prehistoric properties involves four basic tasks: (1) development of an archaeological research design (2) field excavations, (3) laboratory analysis, and (4) report preparation and eligibility determination.

The NRHP was established by the National Historic Preservation Act NHPA of 1966 as “an authoritative guide to be used by Federal, State, and local governments, private groups and citizens to identify the Nation’s cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (CFR 36 CFR 60.2). The NRHP recognizes properties that are significant at the national, state, and local levels. To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. A property is eligible for the NRHP if it is significant under one or more of the following criteria:

- associated with events that made a significant contribution to the broad patterns of our history; or
- associated with the lives of significant persons in our past; or
- embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction

Tribal cultural resources are: 1) sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are listed, or determined to be eligible for listing in the California Register of Historical Resources (CRHR) (California Register), or local register of historical resources, as defined in PRC Section 5020.1(k); or, 2) a resource determined by the lead CEQA agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1(c). For a cultural landscape to be considered a tribal cultural resource, it must be geographically defined in terms of the size and scope of the landscape (PRC Section 21074[b]). Also, an historical resource, as defined in PRC Section 21084.1, unique archaeological resource, as defined in PRC Section 21083.2(g), or non-unique archaeological resource, as defined in PRC Section 21083.2(h), may also be a tribal cultural resource.

2. Impacts

a. *Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?* ***Less than significant impact.***

The archival research search, review of possible sites in the area, site surveys, and analysis described in Appendix D did not find any historic properties individually eligible for the NRHP or the CRHR under any of the criteria within the Bale Slough APE. Accordingly, no impact to those resources is expected. However, it is always possible that unknown historical resources could be uncovered during site grading. Damaging those resources would be a significant environmental impact.

Mitigation Measures

Mitigation Measure CR-1: The project proponent shall develop and initiate archaeological sensitivity training for any construction personnel involved with ground disturbing construction. The training shall cover identification of potential archaeological materials that could occur within the APE, protocols to follow in the event of a potential unexpected discovery including stop work procedures, notifications and expectations for continuing construction operations. The training shall be provided by a Professional Archaeologist.

Mitigation Monitoring and Reporting

The mitigation will be implemented prior to the start of the construction phase. The District will be responsible for ensuring compliance.

Impact Significance After Mitigation

The recommended mitigation measure ensure that any historical or cultural resources found during Project construction will be treated, preserved, curated, and/or disposed of consistent with pertinent federal and State laws and regulations. Therefore, the impact would be reduced to a less-than-significant level.

Mitigation Measure CR-2: If buried archeological resources, such as chipped or ground stone, historic debris, building foundations, or human bone, are inadvertently discovered during ground-disturbing activities, work would stop in that area and within 100 feet of the find until a qualified archaeologist can assess the significance of the find and, if necessary, develop appropriate treatment measures in consultation with the District and other appropriate agencies

Mitigation Monitoring and Reporting

The mitigations will be implemented throughout the construction phase. The District will be responsible for ensuring compliance.

Impact Significance After Mitigation

The recommended mitigation measures ensure that any historical or cultural resources found during Project construction will be treated, preserved, curated, and/or disposed of consistent with pertinent federal and State laws and regulations. Therefore, the impact would be reduced to a less-than-significant level.

b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5? ***Less than significant with mitigation incorporated.***

As noted above, the cultural resources study included in Appendix D found no archeological resources within the Bale Slough APE. However, Mitigation Measures CR-1 and CR-2 would address possible damage to currently unknown archeological resources. This mitigation measure would reduce the potential impacts to unknown archeological resources to a less-than-significant level.

c. Disturb any human remains, including those interred outside of dedicated cemeteries? Less than significant with mitigation incorporated. ***Less than Significant with Mitigation Incorporated.***

There are no known human remains on the site. The mitigation measure below addresses the impact if currently unknown remains are discovered during Project construction.

Mitigation Measures

Mitigation Measure CR-3: If human remains of Native American origin are discovered during Project construction, it is necessary to comply with state laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (NAHC) (PRC 5097). If any human remains are discovered or recognized in any location other than a dedicated cemetery, there will be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the Napa County Medical Examiner has been informed and he/she has determined that no investigation of the cause of death is required; and

Mitigation Monitoring and Reporting

The mitigations will be implemented throughout the construction phase. The District will be responsible for monitoring construction to ensure compliance.

Impact Significance After Mitigation

The recommended mitigation measures ensure that any human remains found during Project construction will be treated, preserved, curated, and/or disposed of consistent with pertinent federal and State laws and regulations. Therefore, the impact would be reduced to a less-than-significant level.

d(i) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place or object with cultural value to a California Native American tribe, and that is listed or eligible for listing in the Caltrans Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)? ***Less than significant.***

d(ii) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place or object with cultural value to a California Native American tribe, and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. ***Less than significant with mitigation incorporated.***

Basin Research Associates who prepared the report in Appendix D contacted the NAHC to identify Native American groups that should be contacted about the Project. They contacted. Communications soliciting additional information were sent to the six Native American individuals/groups recommended by the NAHC. They received no responses from any of these groups or individuals. However, it is possible that tribal cultural resources could be unearthed during project grading. Mitigation Measures CR-1 to CR-3 would apply to the impact and mitigate it to a less-than-significant level.

.

VI. Energy

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			x	
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			x	

.

1. Setting

The Project reach site is mainly an undeveloped stream corridor in a landscape developed mainly with vineyards. No energy is currently used on the site.

Regulatory Setting

EPA Emission Standards for Non-Road Diesel Engines

The U.S. EPA sets nationwide emission standards for mobile sources, which include on-road (highway) motor vehicles such trucks, buses, and automobiles, and non-road (off-road) vehicles and equipment used in construction, agricultural, industrial, and mining activities (such as bulldozers and loaders). The U.S. EPA also sets nationwide fuel standards. California also has the ability to set motor vehicle emission standards and standards for fuel used in California, as long as they are the same or more stringent than the federal standards.

The U.S. EPA has established a number of emission standards for on- and non-road heavy-duty diesel engines used in trucks and other equipment. Heavy-duty diesel on-road vehicle standards and the non-road diesel engine standards are estimated to reduce PM and NOx emissions from diesel engines up to 95 percent in 2030.13 The U.S. EPA has also substantially reduced the amount of sulfur allowed in diesel fuels. The new standards reduced the amount of sulfur allowed by approximately 97 percent for highway diesel fuel and by 99 percent for off-highway diesel. Ultra-low sulfur diesel is currently required for use by all vehicles in the U.S. California has adopted the federal diesel engine and diesel fuel requirements.

Renewables Portfolio Standard Program

In 2002, California established its Renewables Portfolio Standard (RPS) Program, with the goal of increasing the percentage of renewable energy in the State's electricity mix to 20 percent of

retail sales by 2010. In 2008, Executive Order S-14-08 was signed into law requiring retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. In October 2015, Governor Brown signed SB 350 to codify California's climate and clean energy goals. A key provision of SB 350 requires retail sellers and publicly owned utilities to procure 50 percent of their electricity from renewable sources by 2030. SB 100, passed in 2018, requires 100 percent of electricity in California to be provided by 100 percent renewable and carbon-free sources by 2045.

2. Impacts

a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation. ***Less than significant impact.***

Construction activities required to develop the proposed Project – including tree removal, vegetation removal, bank grading, floodplain grading, and stabilization measures – would require the use of heavy equipment that use petroleum fuels. No other energy sources would be affected by the Project. The short-term construction project would involve operating a number of pieces of equipment (scrapers, bulldozers, front loaders, delivery and haul trucks, and vehicles used to transport workers) over a 5-6-month construction period for three years.

Given the Project objectives to restore a slough/stream corridor and floodplain, the use of this energy would benefit the natural environment and reduce flooding over the long term. Therefore, it is concluded that Project energy use would not be a wasteful, inefficient, or unnecessary consumption of energy resources

b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency. ***Less than significant impact.***

As discussed above, the Project is a restoration project that does not include any ongoing or long-term use of energy. This use of petrochemical energy to restore the Project reach would have a negligible effect on local and State energy resources, and would, therefore, be consistent with State plans (e.g., California Long-Term Energy Efficiency Strategic Plan) and County plans to conserve energy. Project energy use would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Moreover, the expenditure of energy would be to restore a slough/stream system so that it would provide additional habitat and improved flooding conditions, thereby potentially reducing future energy use.

VII. Geology and Soils

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			x	
ii. Strong seismic ground shaking?			x	
iii. Seismic-related ground failure, including liquefaction?			x	
iv. Landslides?			x	
b. Result in substantial soil erosion or the loss of topsoil?			x	
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			x	
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?			x	
e. Have soils incapable of adequately supporting the use of septic tanks or alternative water disposal systems where sewers are not available for the disposal of wastewater?				x
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				x

1. Setting

Geologic Setting

Napa County is located in the Coast Ranges geomorphic province of northern California, a region of northwest trending ridges and valleys that stretch along much of the California Coast

and is dissected by only a few structural depressions, the two largest of these are the San Francisco and San Pablo Bays. Napa Valley is another of these structural depressions and is the location of the Project site.

The mountain ranges in the Coast Ranges include steep rugged terrain and ridgelines that separate the ranges into separate watersheds. The larger watersheds typically have headwater areas in the upper mountain zones with multiple tributaries that coalesce into a principal stream course that emerges onto the valley floor. In Napa County, this physical structure, along with the local climate, soils, and hydrology has led to the high agricultural productivity of the region, including its production of premium wine grapes. The County's highest topographic feature is Mount St. Helena (elevation 4,343 ft.), located in the northwest corner of the County. Napa Valley is the main valley in the county, extending southeast along the west side of the County to near the edge of San Pablo Bay. The Napa Valley contains the Napa River, the principal drainage course in the County, which has numerous tributary streams that drain its flanking ridge systems. One of these tributary streams is Bear Creek including the downstream Bale Slough where the proposed Project is located.

Napa Valley was part of the seafloor during the Jurassic epoch (180 million years ago) through to the Miocene epoch (25 million years ago) and is presently underlain by sedimentary deposits varying in texture from mudstone to conglomerates. During the Pliocene (one to 10 million years ago) the valley was uplifted above sea level (ASL) and the Coast Ranges were formed. A period of volcanism spread volcanic rock over the mountain ranges and the valley marine sediments. Post-Miocene faulting resulted in the formation of the Mayacamas, Sonoma and the Howell mountains that form a perimeter around Napa Valley. After thousands of years of erosion and weathering, the volcanics have eroded forming streams and ridges. As uplift continued in the Coast Ranges, terraces were formed in the valley. Alluvial fans, terrace deposits and terrace cuts fill large parts of the valley.

Site Geology

Geology of the Project site as presented on Geologic Maps of the area is characterized as consisting of active stream channel deposits that include predominantly gravel and sand with minor silt of Holocene age.[9] (Clahan and others, 2005). The nearest bedrock to the Project site consists of deposits of the Sonoma Volcanics (Pliocene age) to the east, north and west consisting of andesite and various varieties of rhyolite tuff including agglomerate, tuff breccia, and welded tuff. These rock types are all present in gravels collected from the stream channel and as components of the alluvial deposits underlying the site.

[9] Clahan, K. B. and others, 2005, Preliminary Geologic Map of the Rutherford 7.5-minute Quadrangle, Sonoma and Napa Counties, California: A Digital Database, Version 1.0, California Geological Survey.

Nearby Faults and Seismicity

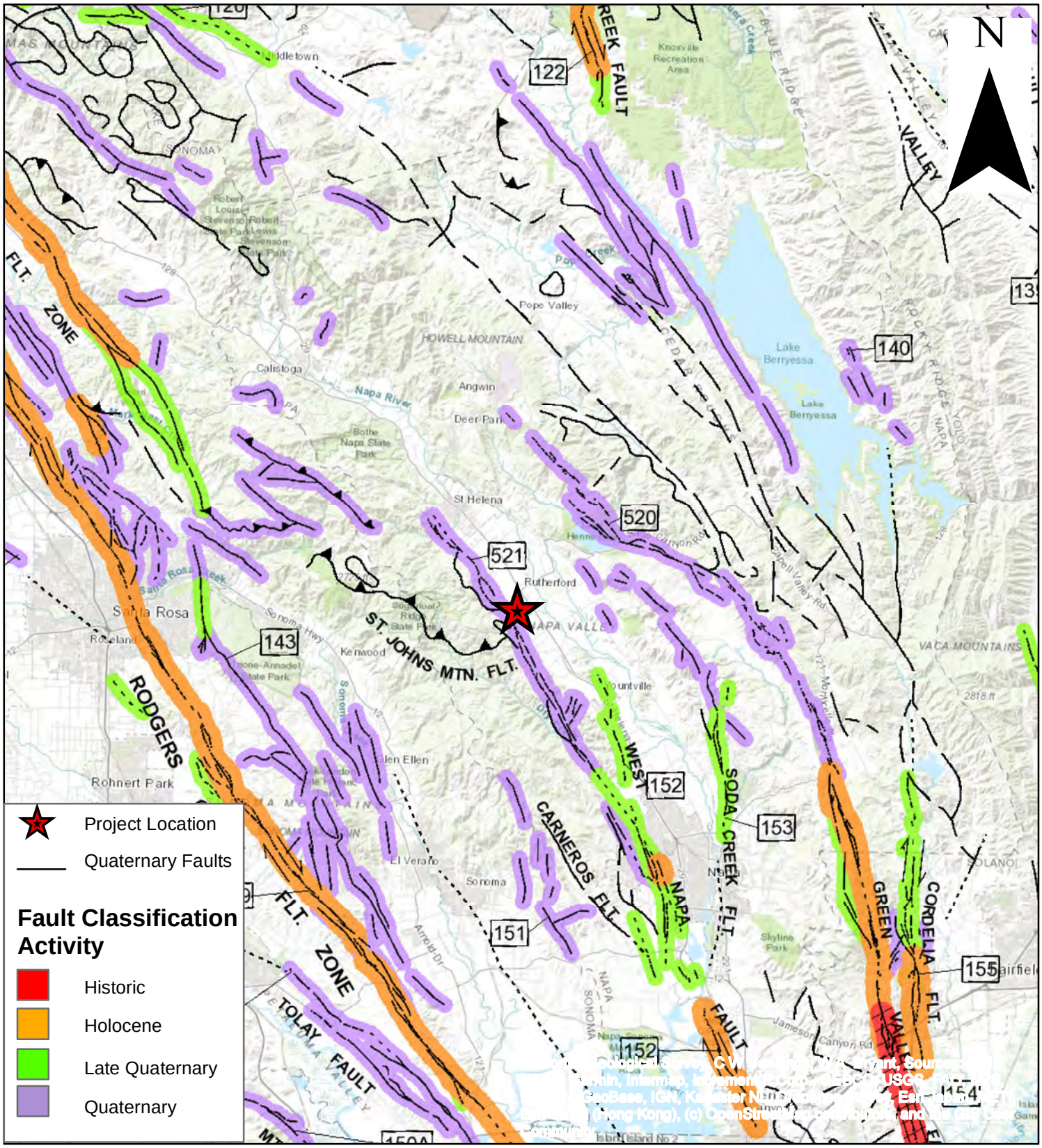
The closest active earthquake faults to the Project area include the West Napa fault located eight miles to the southwest, the Green Valley fault located approximately nine miles to the east, the Hunting Creek-Berryessa fault located 10 miles east, the Mayacamas fault located 13 miles west, and the Rogers Creek fault zone located approximately 14 miles to the southwest.[10] (California Geological Survey, 2010). The San Andreas fault is located approximately 33 miles west-southwest of the Project site. The Project area is not located within an Alquist-Priolo Earthquake Fault Zone as designated by the State of California for active faults and no active faults have been mapped in the direct vicinity of the Project area. Table 9 summarizes the distance to active faults located within approximately 35 miles of the Project site. Figure 8 shows the proximity of the Project area to regional active and potentially active faults.

Table 9. Proximity to Active Earthquake Faults

Fault Name	Distance From Site ml	Direction From Site	Activity	Mean Characteristic Moment Magnitude
West Napa	8	Southwest	Active	6.7
Green Valley	9	East	Active	6.8
Hunting Creek Berryessa	10	East	Active	7.1
Maacama	13	West	Active	7.4
Healdsburg-Rodgers Creek	14	Southwest	Active	7.1
Collayomi	22	Northwest	Potentially Active	6.7
Great Valley	28	East	Active	7.1
Hayward	30	South	Active	7.3
San Andreas-North Coast Segment	33	West	Active	7.5
Bartlett Springs	34	North	Active	7.3

The probability of a magnitude 6.7 or larger earthquake occurring in the San Francisco Region in the next 30 years is 72 percent according to the Working Group on California Earthquake Probabilities (2014). It is estimated that earthquakes between magnitudes 6.0 and 6.7 have a 98 percent probability of occurrence in the next 30 years. Earthquakes of these sizes are capable of considerable damage depending on depth and proximity to the site area. Seismic risk is not isolated to active faults within Napa County; damage can result from activity on one of the major faults located outside of the County and also from seismic activity located on

[10] California Geological Survey, Fault Activity Map of California, Geologic Data Map No. 6.



Regional Fault Map

Bale Slough - Bear Creek Restoration Project

Rutherford, California

QUESTA ENGINEERING CORP.

Figure 8

Date: 4/13/2020

unknown or concealed faults.

Table 10 presents a summary of the major historic earthquakes in Central California located within approximately 50 miles of the Project site with the date of occurrence, magnitude and the approximate distance and direction to the epicenter relative to the site location.

Table 10. List of Major Historic Earthquakes

Location	Date of Earthquake	Magnitude (Richter)	Distance from Site (mi)	Direction To Epicenter
South Napa	August 24, 2014	6.0	17	South
Napa	October 12, 1891	5.6	15	Southeast
Santa Rosa	August 9, 1893	5.6	15	Southwest
Santa Rosa	October 2 1969	5.6	16	West
Santa Rosa	October 2 1969	5.7	17	West
Mare Island	March 31, 1898	6.4	28	South
Great 1906 San Francisco Earthquake	April 18, 1906	7.8	50	Southwest
Hayward Fault	October 21, 1868	7.0	50	South

Source: California Geological Survey, 2013, California Historical Earthquake Online Database (M>=5.5)

Tsunami and Seiche Risk

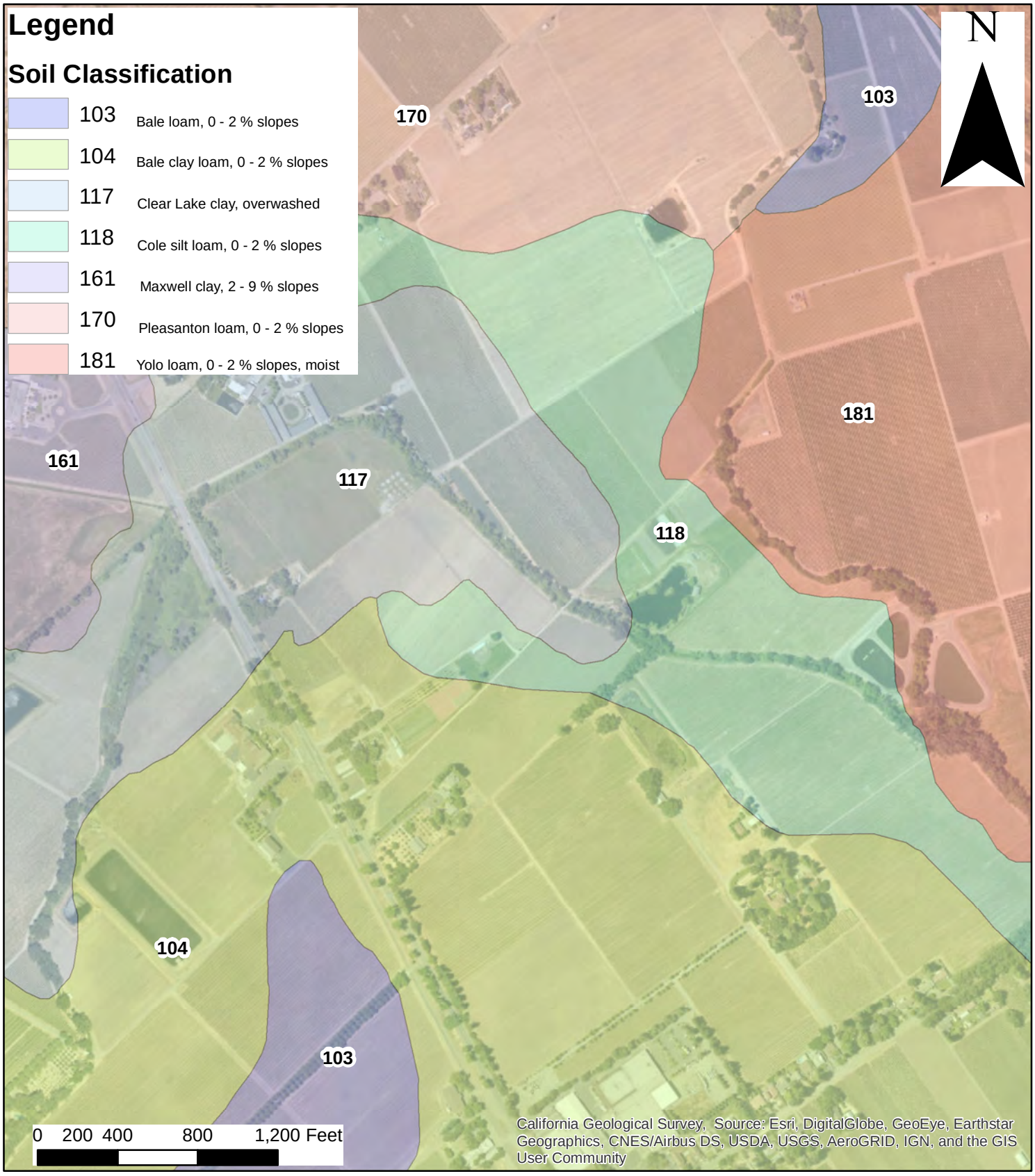
Due to the relative coastal protection provided by San Pablo Bay, and the up-valley distance to the Project area away from the Bay, tsunamis pose little risk to the Project area. There would be no risk for seiche because the Project encompasses a river channel that would not create a standing wave during a seismic event.

Soils

The various types of soils located in the Project vicinity are shown on Figure 9. At the bridge site in Group A, soils are mapped as the Clear Lake Soils as described below. This description is based on a USDA soil survey of Napa County, California (USDA, 1978, Soil Survey of Napa County, California).

Clear Lake Soils

Clear Lake soils consist of dark gray to light olive brown clay. It has low permeability. The over-wash unit found in the Project area has a 12 to 18-inch-thick layer of grayish brown fine sandy



USDA Soil Map

Bale Slough - Bear Creek Restoration Project

Rutherford, California

QUESTA ENGINEERING CORP.

Figure 9

Date: 4/7/2020

loam overlying the clay surface layer. This soil is subject to flooding and subsequent removal and deposition of coarse textured surface material.

Site soils encountered in the subsurface investigation by Questa (2020) include fill soils adjacent to the existing bridge abutments consisting of sandy gravel and underlying expansive clay and silty clay alluvial soils. Also encountered were periodic beds of clayey sand. In the creek bed, sediments consist of sandy gravels.

Landslides

Active and dormant landslides found throughout Napa County are dependent on geologic, soil, and hydrologic conditions. Some landslides reflect structural mass movement conditions found along slopes with diminished shear strength. In the Project area, bank instabilities are present along Bear Creek and Bale Slough. Some localized erosion occurs as shearing and slumping features along the streambanks. The proposed Project work includes stabilization of some of the unstable banks in critical areas, such as adjacent to the proposed replacement bridge.

2. Impacts

a. Directly or indirectly cause potentially substantial adverse effects, including the risk of loss, injury, or death involving:

i. *Rupture of known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42****. Less than significant impact****.*

No active earthquake fault zones as defined by the Alquist-Priolo Earthquake Fault Zone Act are located within the Project area. Surface fault rupture is unlikely to occur in the Project area. The proposed Project would not result in construction of structures for human occupancy. Consequently, the potential for impacts related to increased exposure of people or structures to surface fault rupture is considered to be less than significant, and no mitigation is required

*ii. Strong seismic ground shaking****? Less than significant impact.***

The Project area is located in a seismically active area and can be expected to experience strong earthquake groundshaking during the lifetime of the proposed Project. A peak ground acceleration of 0.61 G was determined for a 975-year return period (Questa, 2020). The Project includes the construction of a new replacement bridge across Bale Slough. The bridge will be constructed in accordance with Caltrans standards. The Project seismic design criteria were calculated in accordance with Caltrans ARS Online Version 3.0.2 calculator. The response spectrum was derived based on the USGS 2014 hazard data for a

975-year return period (Questa, 2020). The structural design will adopt the recommendations of the Geotechnical report. The Project would not increase population in the area, and it would not result in the related construction of structures for human occupancy. Consequently, the potential for impacts to increased exposure of people or structures to strong seismic groundshaking is considered less than significant.

iii. Seismic-related ground failure, including liquefaction? ***Less than significant impact.***

Liquefaction susceptibility of the Bear Creek - Bale Slough project area is mapped as an area of high to very high liquefaction susceptibility. Sediment samples collected from the creek bed were also tested for particle size distribution. These creek bed sediments are composed predominantly of well-graded, poorly sorted, sandy gravels, silty gravels, and gravelly sand. These sediments are unlikely to undergo liquefaction during seismic shaking. Other sediments could be present in the stream channels and underlying the channel bottom that would be susceptible to liquefaction (Questa, 2020).

The predominance of the soils encountered during the subsurface geotechnical investigation at the bridge location consists of clay, silty clay and sandy clay, with minor deposits of well-graded gravelly sand and clayey sand (Questa, 2020). The soils that are most susceptible to liquefaction consist of clean sands and silty sands, which were not found in boreholes to the deepest depth of drilling at approximately 42 feet below ground surface. Groundwater was present in each of the boreholes at depths of approximately 10 to 11 feet BGS. Most soils consisted of cohesive soils such as fat clay, sandy lean clay, and clayey sand. The potential for liquefaction of the soils in the top 42 feet below the ground surface is considered low based on subsurface exploration.

Because some substrate materials in the Project area are considered highly susceptible to liquefaction, the Project could be at some risk of liquefaction damage in future earthquakes. The Project would not increase population in the area, and it would not result in the construction of structures for human occupancy. Consequently, the potential for impacts related to increased exposure of people or structures to seismically induced ground failure, including liquefaction is considered less than significant, and no mitigation is required

iv. Landslides? ***Less than significant impact.***

The Project area is located on the floor of the Napa Valley and is not subject to landslide risk. The potential for impacts related to existing landslide hazards, including seismically induced landsliding, is considered less than significant.

Portions of the streambanks along the Bear Creek and Bale Slough in the Project area are subject to periodic bank erosion and failure. The proposed Project includes re-contouring and re-planting existing stream banks that are erosive, or prone to high erosion, to more stable bank conditions. This is generally achieved through grading existing banks that may

be steep into a less steep and gentler gradient. Lessening the bank steepness is an effective way to reduce the erosion potential at an eroding streambank. This type of geomorphic restoration is considered a beneficial impact of the proposed Project.

Impacts related to potential landslides and slope stability are therefore expected to be less than significant overall, and no mitigation is required.

b. Result in substantial soil erosion or the loss of topsoil? ***Less than significant impact.***

Construction activities required to develop the proposed Project – including tree removal, vegetation removal, bank grading and stabilization measures – would have the potential to contribute to increased erosion during the construction period and in the near-term period following construction.

However, a Storm Water Pollution Prevention Plan (SWPPP) and notification for coverage under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit would be required for each phase of construction. This is a requirement of Environmental Commitment Measure EC-3 and is also discussed in the Hydrology and Water Quality section of this evaluation. The District would be responsible for ensuring compliance with the requirements of the SWPPP and would have the authority to stop construction activities in the event of noncompliance or ineffective compliance.

Project earthwork and grading would require temporary removal of topsoil. As much as 26,500 cubic yards of material could be hauled offsite, and as much as 38,000 cubic yards of the topsoil will be reused onsite, either during re-compaction and revegetation efforts or for construction of flood protection berms. Soil loss in the short term will be minimized by grass hydroseeding and erosion control fabric. However, as discussed under Environmental Commitment Measures EC-2, EC-3, and EC-5 in Table 4 in Chapter 3, the District will require restoration contractors to sidecast and stockpile removed topsoil so it can be reused during revegetation; site finishing will include topsoil replacement. With this practice in place, impacts related to topsoil loss would be reduced to the extent feasible. Any residual impact is expected to be small and confined and is considered less than significant. No mitigation is required.

c. Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? ***Less than significant impact.***

As identified in item (a)(4) above, portions of the Project area are currently subject to bank erosion and failure would be improved by re-grading the channel banks to create a wider and gentler bank slope. This type of bank grading is a beneficial impact in terms of restored habitat, stabilized channel banks, and reducing longer-term erosion.

As described above in item (b) the proposed managed streambank retreat areas would allow for a wider channel to develop over time. This approach would also be beneficial in reducing unstable and eroding banks over the longer-term.

No other risks related to geologic or soil instability are currently known in the Project area. However, to ensure site-appropriate design, a geotechnical assessment was conducted for the Project (Questa Engineering, Appendix E). The assessment included an evaluation of the potential for unstable soils in the Project area and included specific Environmental Commitments to avoid and minimize potential impacts during site preparation,

construction, and maintenance. These Environmental Commitments have been incorporated into the proposed Project and are provided in Table 4, and they are summarized below.

- EC-22: Site Preparation (describes the many activities that will occur to prepare the site for construction activities).
- EC-24: Fill Materials (describes requirements for the inspection, removal, and potential reuse of fill materials).
- EC-25: Fill Placement (describes the physical parameters such as depth and compaction rates for reusing and placing fill and also describes the testing of the fill material by a qualified geotechnical engineer).
- EC-26: Surface Drainage (describes slope drainage measures to reduce erosion and other impacts).
- EC-27: Maintenance (describes the annual inspection procedure for the constructed berms).

With implementation of these Environmental Commitments, potential impacts related to soil instability are expected to be less than significant, and no mitigation is required.

*d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property**? Less than significant impact.***

As discussed above, the active Bale Slough – Bear Creek channel and its immediate streambank areas show minimal soil development because the immediate stream corridor is geomorphically active. Floodplain and bench areas adjacent to the active channel are underlain by soils assigned to the Yolo loam, Cole silt loam, Clear Lake clay, and the Maxwell clay. Shrink-swell potential ranges from low to moderate in these soils.

The proposed Project includes construction of flood and setback berms. Onsite materials used in the berms would be subject to engineering testing to verify their suitability for berm construction. As a result, impacts on berm stability as a result of expansive soils are expected to be less than significant, and no mitigation is required.

If moderately expansive soil materials are present in streambank areas, there would be some, probably minor, potential for shrink-swell behavior to result in degradation of bank stabilization treatments over time, as creek level fluctuates. However, the annual maintenance program would be expected to identify any damage rising to the level of a performance concern, and any such damage would be corrected through the annual maintenance program. Thus, impacts on the proposed Project as a result of expansive soils would also be less than significant, and do not require mitigation.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative water disposal systems where sewers are not available for the disposal of wastewater? ***No impact.***

There are no planned on-site wastewater disposal systems at the Project site. The planned restroom will be a pre-engineered pump-out vault structure. The impact of soils incapable of supporting septic tanks or alternative wastewater disposal systems is considered less than significant.

*f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature****? Less than significant impact****.*

All areas proposed for ground-disturbing activity associated with the Project's construction and maintenance are situated on substrate of Holocene age. Although exceptions are made for materials of particular scientific importance, biological remains younger than 10,000 years are not typically considered paleontologically significant. Because of their geologic youth, the Holocene deposits of Bear Creek and Bale Slough are expected to have low sensitivity for paleontological resources and therefore are not considered sensitive for paleontological resources. As a result, no impact on paleontological resources (including unique paleontological resources) is anticipated, and no mitigation is required.

VIII. Greenhouse Gas Emissions

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			x	
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			x	

1. Setting

Climate change is caused by greenhouse gases (GHGs) emitted into the atmosphere around the world from a variety of sources, including the combustion of fuel for energy and transportation, cement manufacturing, and refrigerant emissions. GHGs are those gases that have the ability to trap heat in the atmosphere, a process that is analogous to the way a greenhouse traps heat. GHGs may be emitted as a result of human activities, as well as through natural processes. GHGs have been accumulating in the earth's atmosphere at a faster rate over the last 150 years than has occurred historically. Increasing GHG concentrations in the atmosphere are leading to global climate change.

Regulatory Framework

Executive Order S-3-05 was established by Governor Arnold Schwarzenegger in June 2006 established the following statewide emission reduction targets through the year 2050:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels;
- By 2050, reduce GHG emissions to 80% below 1990 levels.

AB 32, also known as the California Global Warming Solutions Act of 2006 designates the California Air Resources Board (CARB) as the State agency charged with monitoring and regulating sources of emissions of GHGs. Under AB 32, the State board is required to approve a statewide GHG emissions limit equivalent to the statewide GHG emissions level in 1990 to be achieved by 2020 and to adopt rules and regulations in an open public process to achieve the maximum, technologically feasible, and cost-effective GHG emissions reductions. The law establishes periodic targets for reductions and requires certain facilities to report emissions of GHGs annually.

In 2016, SB 32 was signed into law, amending the California Global Warming Solution Act. SB 32, and accompanying Executive Order B-30-15, require CARB to ensure that statewide GHG emissions are reduced to 40 percent below the 1990 level by 2030. CARB updated its Climate Change Scoping Plan in December of 2017 to express the 2030 statewide target in terms of million metric tons of CO_2e ($MMTCO_2e$). Based on the emissions reductions directed by SB 32, the annual 2030 statewide target emissions level for California is 260 $MMTCO_2e$.

SB 375, known as the Sustainable Communities Strategy and Climate Protection Act, was signed into law in September 2008. SB 375 builds upon AB 32 by requiring CARB to develop regional GHG reduction targets for automobile and light truck sectors for 2020 and 2035. The per-capita GHG emissions reduction targets for passenger vehicles in the San Francisco Bay Area include a seven-percent reduction by 2020 and a 15-percent reduction by 2035.

Consistent with the requirements of SB 375, the Metropolitan Transportation Commission (MTC) partnered with the Association of Bay Area Governments (ABAG), BAAQMD, and the Bay Conservation and Development Commission to prepare the region's Sustainable Communities Strategy (SCS) as part of the Regional Transportation Plan process. The SCS is referred to as Plan Bay Area 2040. Plan Bay Area 2040 establishes a course for reducing per-capita GHG emissions through the promotion of compact, high-density, mixed-use neighborhoods near transit, particularly within identified Priority Development Areas (PDAs).

The 2008 Napa County General Plan includes policies aimed at reducing local contributions to global climate change. These policies include supporting efforts to reduce GHG emissions, participating in programs related to global climate change, promoting sustainable practices and green technology in development, promoting the research and development of renewable energy technology, and providing incentives for energy-efficient forms of transportation, among others.

2. Impacts

*a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment**? Less than significant impact.***

The California Emissions Estimator Model (CalEEMod, Version 2020.4.0) was used to estimate GHG emissions from the 3-year construction period (Years 2022-2024). Project annual GHG emissions would reach a maximum of 609 metric tons during Year 2024. The BAAQMD operational significance threshold is 1,100 metric tons per year beyond which emissions are considered cumulatively significant. Project annual emissions would be well below this significance threshold in each of the three years.

After completion of the Project restoration work, net new operational GHG emissions would come only from motor vehicles conducting periodic inspection and maintenance

work. Such emissions would be far below the 1,100 metric ton significance threshold. Therefore, the impact would be less than significant, and no mitigation is required.

b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? ***Less than significant impact.***

Once the restoration work is complete, the Project would only generate minimal vehicle-related emissions associated with inspection/maintenance of the creekbanks and wetlands. Thus, the Project would not conflict with an applicable greenhouse gas reduction plan, policy or regulation.

IX. Hazards and Hazardous Materials

Would the project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			x	
b.	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			x	
c.	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				x
d.	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				x
e.	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?				x
f.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			x	
g.	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?			x	

1. Setting

The site is a slough/stream corridor. No hazardous materials are currently used on the Project site. However, pesticides and herbicides are likely used on vineyard operations that border the stream corridor. Napa Valley has been under active land cultivation for over 100 years, and there may be unknown contamination associated with past agricultural practices (e.g., fuel and pesticide storage and use).

Wildfire Hazards

Much of Napa County has a high wildland fire potential with its long, dry summers, narrow valleys and steep, hilly terrain, and fire-adapted vegetation. In the last several decades, the combination of fire protection technology, environmental regulations, fire suppression policies, and developmental trends have led to increasing fuel loads, and greater potential for catastrophic wildfires. Recognizing the need to assess fire severity, the County closely monitors fire-prone areas with a GIS-based model. The valley floor is ranked as low or moderate fire hazard risk, while the hillslopes on both sides of the valley are ranked as high to very high fire hazard risk.

Airports

There are two public use airports in the County: the Napa County Airport located south of the City of Napa (approximately 20 miles from the proposed Project site), and the Angwin-Parrett Field located in Angwin east of St. Helena (approximately 6 miles from the proposed Project site).

Regulatory Framework

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

In January 1996, the California Environmental Protection Agency (Cal/EPA) adopted regulations implementing a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program [California Code of Regulations (CCR) Title 27, Division 1]). The program implements six elements: Hazardous Materials Release Response Plans and Inventories; California Accidental Release Prevention Program; Underground Storage Tank Program; Aboveground Petroleum Storage Act Program; Hazardous Waste Generator and Onsite Hazardous Waste Treatment (tiered permitting) Programs; and California Uniform Fire Code: Hazardous Material Management Plans and Hazardous Material Inventory Statements. The program is implemented at the local level. The Certified Unified Program Agency (CUPA) is the local agency that is responsible for the implementation of the Unified Program.

The California Department of Toxic Substances Control (DTSC)

The California Department of Toxic Substances Control (DTSC) regulates hazardous waste, remediation of existing contamination, and evaluates procedures to reduce the hazardous waste produced in California. DTSC regulates hazardous waste in California primarily under the authority of the federal Resource Conservation and Recovery Act of 1976 and the California Health and Safety Code. DTSC oversees the cleanup of sites where hazardous substances have been released pursuant to the California Health and Safety Code, Division 20, Chapter 6.8. If remediation activities are required at the Project site, the proposed Project would complete the following analysis: an assessment of air impacts and health impacts associated with the

excavation activities; identification of any applicable local standards which may be exceeded by the excavation activities, including dust levels and noise; identification of transportation impacts from the removal or remedial activities; and classification of the risk of upset should be there an accident at the Site.

In California, DTSC administers the federal RCRA program. California's Hazardous Waste Control Act (HWCA) *California Health and Safety Code Sections 25100 et seq.]) is similar to, but more stringent than, the federal RCRA program. The HWCA provides authority for DTSC to regulate the transportation and disposal of hazardous wastes and establishes standards for hazardous waste facilities.

2. Impacts

*a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials**? Less than significant impact.***

Project construction (e.g., channel widening, grading, installation of habitat features, etc.) is not expected to create a hazard to the public through the routine use of hazardous materials. Hazardous materials present at the construction sites would include substances such as fuels, oils, and lubricants needed to operate construction equipment. As described in Chapter 3 (see Table 4), the selected contractor would be required to implement Environmental Commitment EC-3 and implement various erosion control measures to ensure that water quality is protected during construction. Environmental Commitments EC-7, EC-8, EC-9, and EC-11 include provisions for appropriate handling of any hazardous materials used in the Project area. Environmental Commitment EC-9 includes specific provisions that would minimize the potential for, and effects from, spills occurring during Project construction and would require the preparation of a Spill Prevention and Response Plan (SPRP). The SPRP will describe transport, storage, and disposal procedures; construction site housekeeping practices; and monitoring and spill response protocols. The District will be responsible for ensuring that the Environmental Commitments for water quality protection, hazardous materials control measures, and the SPRP are appropriately implemented by all contractors.

Control of invasive non-native weeds may require limited application of herbicides. Herbicide application would be limited to cutting and painting stumps or foliar or spot spraying using backpack sprayers. As prescribed in EC-17, herbicide would be applied according to manufacturer's specifications by licensed applicators in a manner that minimizes drip and drift into the stream channel, and authorization would be obtained from the RWQCB if application would occur below the OHWM.

With these procedures in place, potential impacts related to the transport, use, and disposal of hazardous materials associated with Project construction and maintenance are expected to be less than significant, and no mitigation is required.

b. *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment**? Less than significant impact.***

See the discussion under Checklist Item XI(a) above.

c. *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?* ***No impact.***

The Project site is not within one-quarter mile of any school. Therefore, there would be no impact

d. *Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?* ***No impact.***

The Project site is not on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 known as the Cortese List.

e. *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?* ***No impact.***

As noted in the Setting section, the nearest airport is 6 miles away. The Project site is not within the airport land use plan of either airport in Napa County. Therefore, there would be no impact regarding air safety.

f. *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?* ***Less than Significant impact.***

The Project would not interfere with any existing emergency response or evacuation plan. As described in Chapter 2, Environmental Commitments EC-12 and EC-13 include measures to ensure the contactor maintains adequate traffic flow and coordinates with the County to maintain emergency access prior to initiating construction. This would ensure that any constructed-related impacts on emergency response or evacuation are less than significant. No mitigation is required.

g. *Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?* ***Less than significant impact.***

The Project area is located in area region identified as having a “Not-Very High Fire Hazard”. The use of some types of construction equipment, including equipment with internal combustion engine and gasoline-powered hand tools, could pose a risk of wildfire ignition. However, the construction contractor would be required to comply with existing legal requirements under the California Public Resources Code to minimize wildlife risk during construction (see Chapter 2, Environmental Commitments). With these measures in place, impacts related to increased wildfire risks associated with Project construction are expected to be less than significant. No mitigation is required.

X. Hydrology and Water Quality

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?			x	
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?				x
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:			x	
(I). result in substantial erosion or siltation on- or off-site;			x	
(II). substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;			x	
(III). create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or			x	
(iv). impede or redirect flood flows?			x	
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?				x
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?				x

1. Setting

Climate and Precipitation

Napa County has a Mediterranean climate with distinct wet and dry seasons. Approximately 90% of the precipitation occurs between November and April and can vary significantly from year to year. In general, precipitation increases from south to north with increasing elevation, and annual precipitation varies by more than a factor of three throughout the County, from 22.5 inches per year (in/yr) in the south County to 75 in/yr in the higher Mayacamas Mountains

in northwest County. Annual precipitation in the City of Napa averages approximately 26.5 in/yr. Average annual precipitation in the community of Rutherford, near the Project area is 35 in/yr.

Surface Water Hydrology and Quality

Bale Slough - Bear Creek is a tributary to the Napa River. The Napa River is the largest river in Napa County. Its watershed covers approximately 426 square miles, extending in a northwesterly direction approximately 45 miles from San Pablo Bay on the south to Calistoga on the north. The valley is bounded on the west by the Mayacamas Mountains (ranging from 1,000 to 2,700 feet above sea level [ft. asl]), on the north by Mt. St. Helena (elevation 4,343 ft. asl), and on the east by a northwest-trending range of mountains that are generally above 2,000 ft. The southern portion of Napa Valley is very flat, with elevations ranging from near sea level on the valley floor to 400 ft. along the valley flanks. The elevation of the Project area ranges from 140 ft. at its eastern end in Bale slough to 165 ft. at its upper Bear creek end. The higher mountains that ring the Napa River watershed provide the headwater source areas for runoff and sediment that accumulate in the tributary and valley floor streams below.

Bale Slough – Bear Creek watershed is approximately 10 square miles. Streamflow in Bale Slough – Bear Creek generally peaks in January and February and the creek channel is generally dry by mid-June/early July. Highway 29 bisects the drainage and is considered the dividing line between Bear Creek and Bale Slough. The Bear Creek channels do not have flow capacity to contain flood events. Water leaves the channels and flows into the adjacent vineyards upstream of Highway 29. Highway 29 itself is elevated and contributes to the upstream ponding/shallow flooding of the areas adjacent to the creek. Once water flows under Highway 29, it enters Bale Slough. The slough flows throughs vineyard areas and eventually discharges into the Napa River just downstream of Rutherford Road.

Water Quality

Surface water quality in Bale Slough – Bear Creek varies seasonally. During the winter months, stormflows convey urban and agricultural runoff and associated pollutants (e.g., fine sediments, fertilizer residue, pesticides, pathogens, metals, and nutrients) into the Napa River. However, because of high flows and the resulting dilution of pollutant input, pollutant concentrations during this period are relatively low, although turbidity can be elevated by high sediment loading.

The Napa River is on the State 303(d) list of “impaired” water bodies that the San Francisco Bay RWQCB have determined does not meet water quality standards for sediment and pathogens. As a result of this listing and concerns about adverse impacts to aquatic habitat and associated species, the RWQCB has developed Total Maximum Daily Load (TMDL) programs that established pollutant budgets and control plans in the Napa River and its watershed. Additionally, the RWQCB is developing a TMDL to address elevated nutrient concentrations.

The Napa River Sediment TMDL identified streambank erosion as a primary source of fine sediments in the Napa River and recommends implementation of projects to stabilize actively eroding stream banks, control channel incision, and restore aquatic habitat.[11]

Groundwater Hydrology and Quality

The major aquifers in the County are the North Napa Valley and Milliken-Sarco-Tulucay groundwater basins. Smaller aquifers include the Carneros groundwater basin and small basins within the Putah Creek Watershed. The North Napa Valley groundwater basin is the largest and most productive groundwater basin in the County and is found beneath the Project area. This basin extends from just north of the City of Napa up the valley floor to the northwestern end of the valley just north of the City of Calistoga, covering an area of approximately 60 square miles. In general, groundwater flow in the North Napa Valley groundwater basin is from the valley edges inward toward the center, and southwest towards San Pablo Bay. Studies conducted by the District estimate the storage capacity of these surficial deposits at approximately 190,000 acre-feet, and the average annual recharge for the basin from deep percolation, surface tributary flow, and subsurface flow at approximately 26,800 acre-feet per year. Within the Project area, groundwater is pumped for both domestic and agricultural use.

In general, the depth to groundwater in the Napa Valley ranges from about 10 to 50 feet below ground surface during the spring. Boring investigations in May of 2020 indicated that groundwater was found generally between 10-11 feet. below the ground surface in the Project area (Questa Engineering 2020). This surface would be expected to drop through the summer irrigation season. Long-term trends have been generally stable with the exception of the northeastern area of the County where there has been a 10 to 30-foot decline over the past 10 years. Seasonal groundwater elevations may fluctuate up to 10 to 40 feet in depth in the Napa Valley region, seasonally.

Groundwater quality in the basin is primarily affected by pollutants (e.g., pesticide and/or fertilizer residues) that are leached out of surface soils by rainfall and conveyed into the aquifer through percolation. Surface water contaminants also have the potential to impact groundwater quality.[12]

---

11 San Francisco Bay Regional Water Quality Control Board. 2005. Napa River Sediment Total Maximum Daily Load Technical Report. Oakland, CA: California Regional Water Quality Control Board, San Francisco Bay Region.

12 Napa County. 2008. Napa County General Plan. Napa County Department of Conservation, Development and Planning. Adopted June 3, 2008 and updated as of June 2013. Available online at: http://www.countyofnapa.org/generalplan/

Regulatory Framework

Overview

The federal Clean Water Act and California's Porter-Cologne Water Quality Control Act are the primary laws related to water quality in California. Regulations set forth by the U.S. EPA and the State Water Resources Control Board (SWRCB) have been developed to fulfill the requirements of this legislation. EPA regulations include the National Pollutant Discharge Elimination System (NPDES) permit program, which controls sources that discharge pollutants into the waters of the United States (e.g., streams, lakes, bays, etc.). These regulations are implemented at the regional level by the RWQCBs. The Project site is within the jurisdiction of North Coast RWQCB.

Clean Water Act

The Clean Water Act (CWA) regulates the discharge of pollutants into the waters of the U.S. and the quality standards for surface waters which includes lakes, rivers, streams, wetlands, and coastal areas. The CWA made it unlawful to discharge any pollutant into navigable waters (as defined by the U.S. Army Corps of Engineers)

Construction General Permit Order 2009-0009-DWQ

Dischargers are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity Construction General Permit Order 2009-0009-DWQ if their projects disturb one or more acres of soil or disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres.

2 Project Impacts

Overview

Surface Water Hydrology

As part of the Project design study, West Consultants completed an analysis of the pre- and post -project effects on the hydrology and hydraulics of the system (West Consultants 2021 – on file with the Napa County Flood Control & Water Conservation District). They constructed two models to quantify flow and flooding parameters in the system. West Consultants used the US Army Corps of Engineering models, HEC-HMS (hydrology model) and HEC-RAS (hydraulics model) for the system. The Tables 11 and 12 show the results of the hydrologic modeling. Figure 0 shows then general concentration points in the Bale Slough – Bear Creek system used in the study.

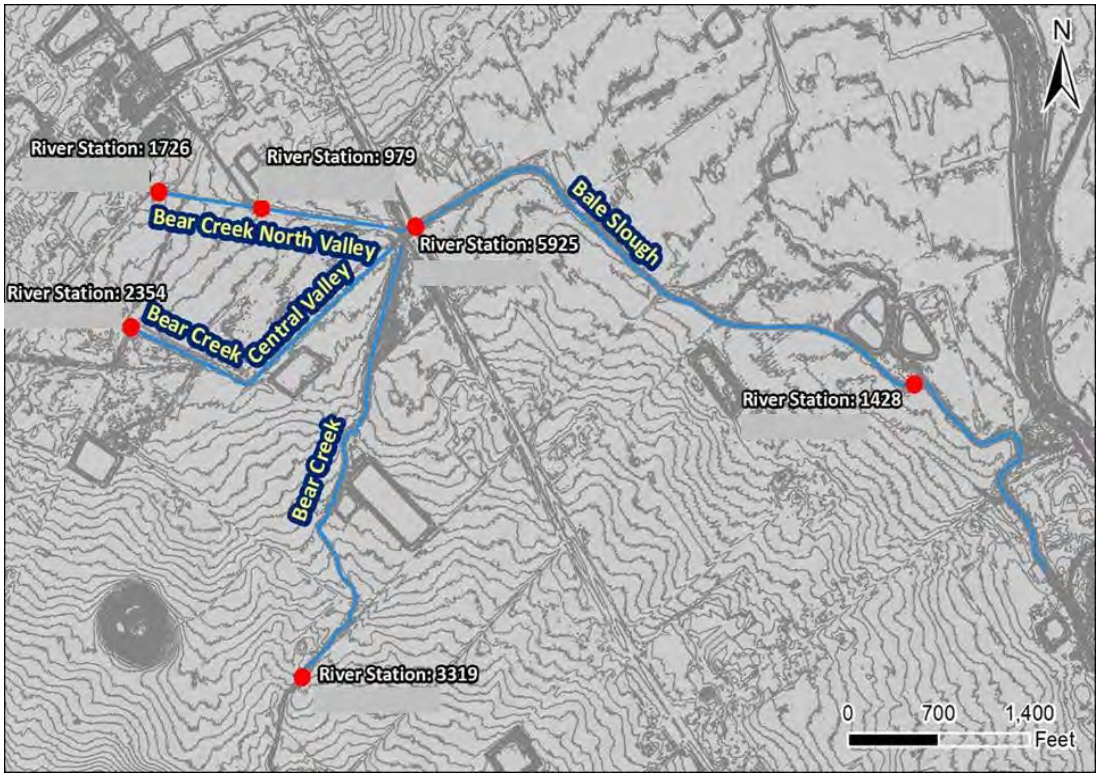


Figure 10 - HEC-RAS Inflow Locations

Table 11. HEC-HMS Proposed Condition Peak Flow Results

River	River Station	Watershed Area (sq-mi)	1-yr (cfs)	2-yr (cfs)	5-yr (cfs)	10-yr (cfs)	100-yr (cfs)
Bear Creek North Valley Tributary	1726	1.8	205	315	470	600	1050
Bear Creek North Valley Tributary	979	4.0	260	420	640	820	1460
Bear Creek Central Valley Tributary	2354	0.7	60	110	175	235	450
Bear Creek	3319	3.7	210	380	630	840	1610
Bale Slough	5925	9.8	510	870	1190	1430	2990
Bale Slough	1428	10.0	520	880	1320	1620	3080

Table 12. Change in Peak Flow from Existing Conditions to Proposed Conditions

1-yr		2-yr		5-yr		10-yr		100-yr	
Value (cfs)	%	Value (cfs)	%	Value (cfs)	%	Value (cfs)	%	Value (cfs)	%
0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
-10	-14.3%	-10	-8.3%	-15	-7.9%	-15	-6.0%	-20	-4.3%
0	0.0%	0	0.0%	0	0.0%	0	0.0%	-10	-0.6%
-10	-2.0%	-20	-2.4%	-20	-1.7%	-20	-1.4%	-80	-2.6%
-40	-7.1%	-60	-6.4%	-50	-3.6%	-50	-3.0%	-240	-7.2%

As can be seen by the two tables, the Project will result in a reduction of peak stormwater flows throughout the Bale Slough system. This is because the Group C project provides greater floodplain storage and attenuation of large flows, and the channel widening in Groups A and B reduces flow velocities creating small amounts of flood peak attenuation that result in slight reductions in large recurrent event peak flows in Bale Slough below Highway 29.

Flood Conditions

The West Consultants' study also examined how flooding conditions would be impacted by the proposed Project. The channel will be widened downstream for Project Groups A and B, and the floodplain storage in Group C will be enlarged. West Consultants used the HMS model to examine the floodplain ponding/storage area above Highway 29 and whether the excavation and reconfiguration of the floodplain would have an impact on flows downstream and the depth of flooding above Highway 29. Figure 11 shows the floodplain area that was considered above Highway 29. Table 13 shows that the Project will slightly reduce ponding elevations during lesser flood events and have no impact on elevations in the 100-year flooding in the area.

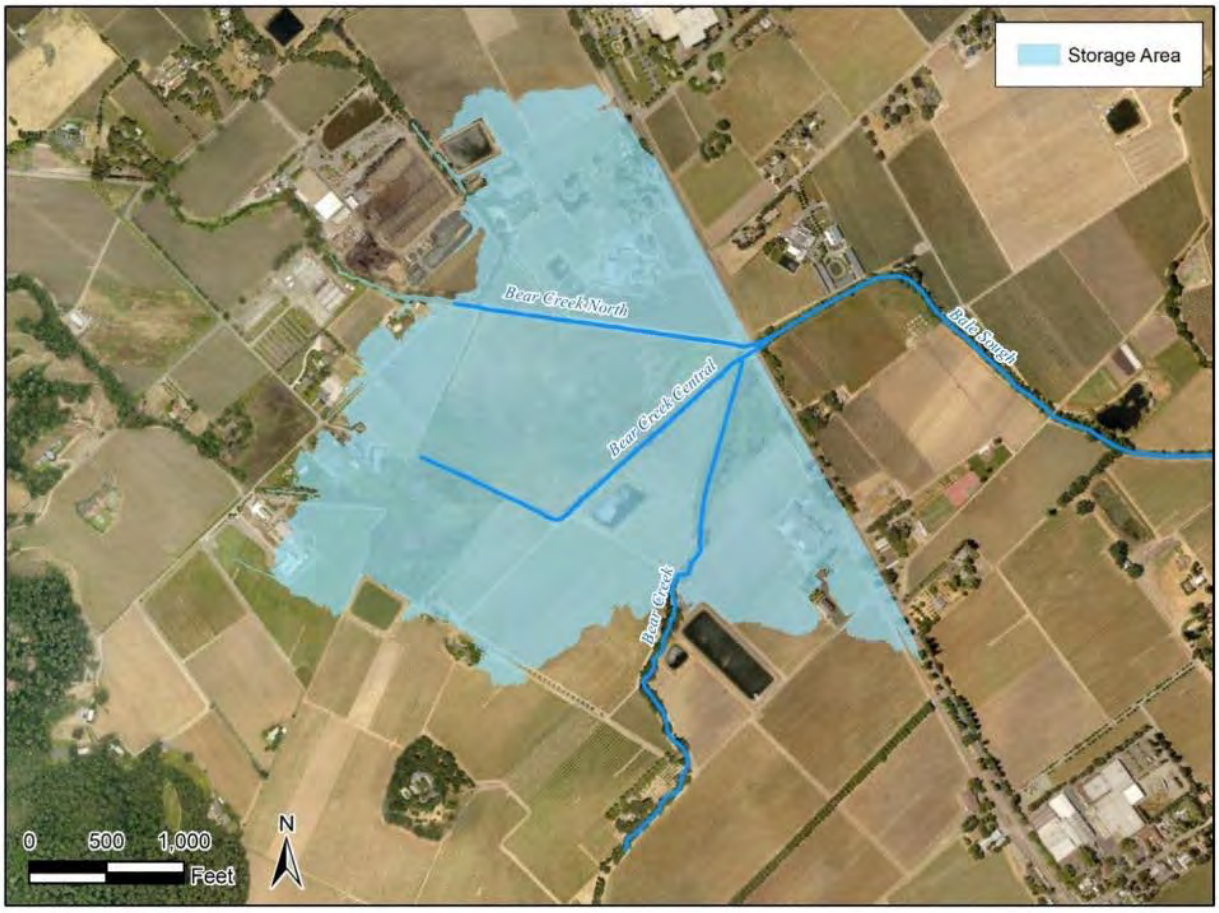


Figure 11 - Area Used in Storage-routing Calculations Upstream of Highway 29

Table 13. Pre- and Post-Project Flooding/Ponding Elevations Above Highway 29

Flow profile	Pre-project Water surface elevation (ft, NAVD 88)	Post-project Water surface elevation (ft, NAVD 88)	Change
1-yr	159.80	159.72	-0.08
2-yr	160.74	160.68	-0.06
5-yr	162.19	162.11	-0.08
10-yr	163.18	163.11	-0.07
100-yr	164.73	164.73	0.00

The Project was not designed as a flood control project. However, channel capacity and flooding conditions downstream of Highway 29 will be improved since the Project involves widening the channel, increasing the floodplain area, and replacing an old bridge that crosses the slough. The water surface elevations under future conditions would be generally lower than existing conditions for each modeled event. The comparative results are shown in Tables 14 to 16.

Table 14. Change in Water Surface Elevation (WSE) Between Existing and Proposed Conditions After Restoration in Group A

Reach	Cross section	1-yr	2-yr	5-yr	10-yr	100-yr
		ΔWSE (ft)	ΔWSE (ft)	ΔWSE (ft)	ΔWSE (ft)	ΔWSE (ft)
Bale Slough	2928	-0.82	-0.40	-0.15	-0.13	-0.29
	2770	-0.70	-0.33	-0.19	-0.16	-0.34
	2623	-0.58	-0.31	-0.17	-0.15	-0.36
	2476	-0.54	-0.35	-0.15	-0.16	-0.37
	2330	-0.68	-0.45	-0.16	-0.16	-0.39
	2182	-1.29	-0.72	-0.24	-0.22	-0.42
	2032	-1.90	-1.26	-0.34	-0.27	-0.44
	1883	-1.88	-0.95	-0.33	-0.27	-0.45
	1738	-1.97	-1.14	-0.27	-0.24	-0.44
	1585	-1.30	-0.57	-0.21	-0.19	-0.43
	1428	-1.23	-0.58	-0.17	-0.18	-0.43
	1281	-1.42	-0.65	-0.16	-0.17	-0.43
	1130	-1.41	-0.67	-0.15	-0.18	-0.43
	984	-1.25	-0.61	-0.12	-0.16	-0.43
	837	-1.11	-0.59	-0.11	-0.16	-0.43
	726	-1.22	-0.67	-0.11	-0.15	-0.42
	557	-1.13	-0.62	-0.08	-0.14	-0.42
	395	-0.92	-0.53	-0.06	-0.13	-0.40
	246	-0.58	-0.42	-0.03	-0.12	-0.39

Table 15. Change in WSE Between Existing and Proposed After Restoration in Group B

Reach	Cross section	1-yr	2-yr	5-yr	10-yr	100-yr
		ΔWSE (ft)	ΔWSE (ft)	ΔWSE (ft)	ΔWSE (ft)	ΔWSE (ft)
Bale Slough	5925	-1.35	-1.66	-2.16	-2.71	-5.50
	5873	-0.91	-1.09	-2.20	-2.75	-5.55
	5707	-1.23	-1.62	-2.38	-2.94	-5.75
	5545	-0.44	-1.83	-2.62	-3.20	-6.01
	5431	-1.22	-2.07	-2.87	-3.45	-6.25
	5284	-1.62	-2.43	-3.22	-3.80	-6.52
	5157	-1.85	-2.62	-3.40	-3.96	-6.64
	5001	-2.04	-2.81	-3.58	-4.14	-6.75
	4815	-2.14	-2.77	-3.51	-4.01	-6.26
	4680	-1.52	-2.03	-2.90	-3.45	-5.74
	4521	-0.09	0.51	0.84	0.35	-1.39
	4388	-0.34	-0.12	-0.05	-0.05	-0.20
	4242	-0.35	-0.12	-0.06	-0.04	-0.20
	4094	-0.37	-0.12	-0.06	-0.05	-0.20
	3947	-0.38	-0.12	-0.05	-0.04	-0.20
	3798	-0.38	-0.11	-0.04	-0.03	-0.18
	3676	-0.38	-0.11	-0.03	-0.03	-0.19
	3599	-0.38	-0.11	-0.03	-0.02	-0.18
	3541	-0.10	-0.05	-0.02	-0.02	-0.21
	3494	-0.15	-0.06	-0.02	-0.02	-0.22
	3367	-0.23	-0.06	-0.03	-0.03	-0.23
	3211	-0.41	0.00	-0.02	-0.02	-0.25

Table 16. Change in WSE Between Existing and Proposed Conditions After Restoration in Group C

Reach	Cross section	1-yr	2-yr	5-yr	10-yr	100-yr
		ΔWSE (ft)	ΔWSE (ft)	ΔWSE (ft)	ΔWSE (ft)	ΔWSE (ft)
Bear Creek North	520	-0.11	-1.19	-1.11	-0.50	-1.25
	386	-0.94	-1.46	-1.11	-0.50	-1.26
	282	-0.90	-1.48	-1.12	-0.50	-1.26
	181	-0.90	-1.49	-1.12	-0.50	-1.26
	87	-0.93	-1.50	-1.12	-0.50	-1.27
Bear Creek Center	2057	-0.35	-0.25	-0.98	-0.49	-1.24
	1941	-0.96	-0.56	-1.05	-0.49	-1.24
	1834	-1.09	-0.66	-1.07	-0.50	-1.25
	1640	-1.31	-0.92	-1.10	-0.50	-1.25
	1409	-1.55	-1.22	-1.11	-0.50	-1.25
	1138	-1.45	-1.50	-1.12	-0.50	-1.25
	1027	-1.29	-1.56	-1.12	-0.50	-1.25
	886	-1.21	-1.58	-1.12	-0.50	-1.25
	736	-1.19	-1.59	-1.12	-0.50	-1.25
	609	-1.19	-1.59	-1.12	-0.50	-1.25
	481	-1.18	-1.59	-1.12	-0.50	-1.26
	288	-1.18	-1.59	-1.12	-0.50	-1.26
	151	-1.17	-1.59	-1.12	-0.50	-1.26
	78	-1.17	-1.59	-1.12	-0.50	-1.26
Bear Creek South	899	-0.01	-0.03	-0.12	-0.20	-0.90
	748	-0.03	-0.06	-0.45	-0.38	-1.07
	560	-0.35	-0.31	-0.77	-0.45	-1.16
	356	-0.43	-0.25	-0.88	-0.45	-1.19
	222	-0.93	-0.26	-0.93	-0.46	-1.21
	130	-0.94	-0.46	-0.99	-0.47	-1.22

Sediment Transport Analysis

In order to ensure that the Project would not significantly alter the sediment transport of Bale Slough – Bear Creek, a sediment transport analysis of the Project was completed. A Sediment Impact Assessment Model (SIAM) was used to compare the annual sediment transport capacity of a reach to the annual sediment supply and to provide an indication of whether aggradation, degradation, or relative equilibrium is predicted. By comparing the results for existing and proposed conditions, the SIAM analysis indicates whether increased aggradation or degradation is projected to occur in each reach.

Sediment samples were taken for each of the reaches in the Project and used in the analysis. The results of the analysis show there is little change in the sediment transport of the system. Although there were minor differences between existing conditions and proposed conditions in the local balance of each reach, the differences were considered negligible. All reaches are

slightly aggregational under existing conditions, and they continue to be slightly aggregational under proposed conditions.

2. Project Impacts

a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality? ***Less than significant impact.***

Construction Phase

Ground-disturbing construction activities that would occur in the channel such as grading, excavation, and stockpiling of spoil materials, could cause soil erosion and sedimentation, and reduce water quality in the Project reach and the Napa River. These activities would include channel widening, lowering of stream banks, installing biotechnical stabilization features, installing habitat enhancement features, etc. Additionally, hazardous materials (e.g., gasoline, oils, grease, lubricants) from construction equipment could be accidently released during construction. Accidental discharge of these materials to adjacent surface waters could adversely impact water quality, endanger aquatic life, and/or result in a violation of water quality standards.

Potential impacts on water quality during Project construction would be addressed by the construction Environmental Commitments incorporated into the Project (see EC-1 through EC-11 in Table 4 in Chapter 3, which include provisions to avoid and/or minimize work in the active/wetted stream channel, control erosion and sedimentation, as well as implement a Spill Prevention and Response Plan to avoid, and if necessary, clean up accidental releases of hazardous materials. As the Project proponent, the District would be responsible for ensuring compliance with all conditions of these commitments.

Out-of-channel construction activities, such as vegetation removal, grading of areas for restoration of floodplains, constructing new protective berms ,and relocating agricultural access roads, could result in some erosion and increase sedimentation through runoff into adjacent surface waterways. Additionally, areas where existing vineyards may be removed so they can be restored to riparian habitat may also require ground disturbance, contributing to the aforementioned erosion potential. However, the Environmental Commitments mentioned previously, which include utilizing existing access roads, staging in previously disturbed areas, and implementing erosion control measures would avoid or minimize the potential impacts to water quality.

For both in-channel and out-of-channel areas, during the period following construction and before vegetation is fully established, there is some potential for erosion at Project sites (e.g., from benches and slopes, earthen berms, biotechnical stabilization features) and potential increases in sediment loading to the Napa River. However, all Project features would be seeded (hydroseeded) and erosion control features installed in erosion-prone

areas to prevent erosion and sedimentation. Additionally, as part of the Project maintenance plan, all constructed features would be monitored annually, and any necessary remedial actions (e.g., additional planting and/or erosion blanket and other control installation) will be implemented by the District.

With these Environmental Commitments and District oversight, adverse construction-related effects on water quality would be avoided and/or reduced to the extent feasible. Therefore, no violation of water quality standards or waste discharge requirements are anticipated and impacts to water quality are considered less than significant. No mitigation is required.

Long Term Maintenance

The Project would restore and enhance geomorphic processes in the Project reach. The treatments of the proposed Project were designed to improve the channel's ability to convey flood flows and to reduce undesirable bank erosion and sediment loading effects. These actions are consistent with and support the sediment TMDL for the Napa River watershed, and they are regarded as long-term benefits to the system

As described above in the Setting section, the Napa River is on the Clean Water Act Section 303(d) list of "impaired" water bodies that do not meet water quality standards set by the San Francisco Bay RWQCB, and TMDL programs have been developed to address sediment in the Napa River system. The long-term geomorphic changes resulting from the Project (e.g., creating inset floodplain benches/slopes, stabilizing banks, and constructing aquatic habitat enhancement structures) would stabilize actively eroding streambanks, reduce local flow velocities, reduce inputs of fine sediments to the Napa River, and enhance habitat for native aquatic species. All of these outcomes are consistent with recommendations in the sediment TMDL and would represent benefits to water quality.

Project maintenance activities such as minor grading, bank toe stabilization, invasive non-native vegetation control, targeted woody vegetation removal, and Pierce's disease host plant removal could cause local soil erosion and sedimentation and adversely affect water quality locally in Bale Slough. Additionally, hazardous materials (e.g., gasoline, oils, grease, lubricants, herbicides) used during maintenance could be accidently released during construction. Accidental discharge of these materials adjacent to surface waters could adversely impact water quality, endanger aquatic life, and/or result in a violation of water quality standards. However, maintenance workers would be required to follow the same water quality Environmental Commitments as mentioned previously during Project construction. The District will be responsible for ensuring that the measures provided in the Project maintenance program are appropriately implemented by all maintenance workers. With these commitments and District oversight, maintenance-related impacts to water

quality and water quality standard are expected to be less than significant, and no mitigation is required.

b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin? ***No impact.***

Proposed Project features (e.g., channel widening, increasing floodplain depth, grading back of stream banks, installation of biotechnical stabilization features, installation of habitat features, etc.) have been designed and located to avoid impacts to existing groundwater wells and pumping facilities. No new wells or pumps would be installed as part of the Project. Some limited areas of compacted earthen berms may be relocated or installed where floodplain benches and slopes are installed, but the overall increase in compacted surfaces would be minimal, consisting mainly of relocated berms. Thus, the slight increase in impervious area associated with any new earthen berms would have little effect on groundwater recharge or on groundwater supply. The Group C projects of increasing the seasonally ponded areas above Highway is expected to enhance or increase groundwater infiltration in that location. The Group C projects would have a positive impact as regards groundwater recharge. Impacts to groundwater recharge are therefore expected to be less than significant, and no mitigation is required.

Planting of native species as part of the restoration would require supplemental irrigation for approximately 3−5 years following installation. Irrigation may rely on existing sources of groundwater. However, the total planting area is relatively small, and irrigation would be limited to drip irrigation and overhead sprinklers of specific areas. Thus, irrigation of native plantings would require comparatively small quantities of water compared to adjacent agricultural water uses and would have very little effect on groundwater reserves/supply within the Project area. Impacts are therefore expected to be less than significant, and no mitigation is required.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

(I) result in substantial erosion or siltation on- or off-site. ***Less than significant impact.***

Project construction would cause potential erosion. However, erosion impacts would be reduced to a less-than-significant level by implementing the previously described Environmental Commitments measures as well as Environmental Commitment EC-3.

(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; ***Less than significant impact.***

As previously described, the Project is specifically designed to modify selected portions of the Bale Slough – Bear Creek channel and some immediately adjacent floodplain areas. The purpose of these modifications is to restore more natural geomorphic processes and improve channel and floodplain function. Project features will be constructed within the 100- and 500-year flood hazard zones identified by FEMA. The Napa County Floodplain Management Ordinance requires any project proposed for construction within the floodplain of a stream or river to obtain a floodplain permit and to demonstrate that the project will not result in an increase in the 100-year base flood elevation. Hydrology and hydraulic analysis of the Project has demonstrated that the Project will not impact 100-year flood elevations. Maintenance of relocated or new set-back berms will be the responsibility of private landowners and/or the District**.** The widening of the river channel in locations in the Project area along with some restoration of floodplain function would provide beneficial effects of increasing channel capacity and floodplain storage. The increased channel capacity and floodplain storage are expected to slightly reduce the overall flood risk in the Project area and correspondingly reduce potential for damage to adjacent agriculture and residences. Therefore, impacts related to flood hazards are expected to be less than significant, and no mitigation is required.

(iII) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or ***Less than significant impact.***

(iv) impede or redirect flood flows? ***Less than significant impact.***

As described previously, the hydrologic and hydraulic analysis of the Project have that the Project will not adversely impact 100-year flood elevations. Maintenance of relocated or new set-back berms will be the responsibility of private landowners and/or the District. The widening of the stream channel in several locations in the Project area as well as restoring some of the floodplain function would provide beneficial effects of increased channel capacity and floodplain storage. These outcomes are anticipated to minimally reduce the overall flood risk in the Project area and reduce potential for damage to adjacent agriculture and residences. Therefore, impacts related to redirection of flood flows are expected to be less than significant, and no mitigation is required.

*d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation****? Less than significant impact.***

The Project area is located inland, approximately 20 miles from the nearest large water body (San Pablo Bay). Consequently, there is no risk of seiche or tsunami, and there would be no impact related to increase of any such risk as a result of the Project. The Project area is located on the valley floor approximately 0.5 mile away from the nearest hillslope area, so

is unlikely to be affected by, or to increase the potential for, mudflows. Therefore, no impact related to increase of mudflow risks is anticipated. No mitigation is required.

e. *Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?* ***Less than significant impact.***

As described above Checklist Item (a), the Napa River is on the Clean Water Act Section 303(d) list of "impaired" water bodies that do not meet water quality standards set by the San Francisco Bay RWQCB; TMDL programs have been developed to address sediment in the Napa River system. The long-term geomorphic changes resulting from the Project (e.g., creation of inset floodplain benches/slopes, bank stabilization, and aquatic habitat enhancement structures) would stabilize actively eroding streambanks, reduce local flow velocities, and reduce inputs of fine sediments to the Napa River; and enhance habitat for native aquatic species. All of these outcomes are consistent with recommendations in the sediment TMDL and would represent benefits to water quality.

XI. Land Use and Planning

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Physically divide an established community?				x
b. Cause a significant environmental impact due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?				x

1. Setting

Land use planning in unincorporated areas of Napa County is governed by the Napa County General Plan. The General Plan envisions agriculture as the "primary land use" in the County "well into the future". It includes a number of goals specific to agricultural preservation and-related issues. It also includes many goals that indirectly guide and constrain land use planning through protections for the County's aesthetic values, agricultural uses, riparian and wetland areas, and sensitive plant and wildlife species as well as through flood protection and other safety-oriented policies. In the Conservation Element, Policy CON-6 requires the County to "impose conditions on discretionary projects which limit development in ecologically sensitive areas such as those adjacent to rivers or streamside areas." A number of General Plan goals and policies also specifically address the need to protect and preserve riparian and instream habitat values, to support the County's fisheries, and particularly native anadromous fish species (Chinook salmon and steelhead).

The proposed Project would be entirely located on privately owned land. The Project area is entirely within the unincorporated portion of Napa County and, like much of the unincorporated County, is rural and agricultural in character. The County General Plan designates the Project area as Agricultural Resource (AR) lands, which are correspondingly zoned AP (Agricultural Preserve)."

2. Impacts

a. Physically divide an established community? ***No impact.***

The proposed Project would take place in a rural, agricultural area. Earthwork to restore a more functional channel geometry, bank stabilization, and other project features would be located along the immediate Bale Slough - Bear Creek corridor and would not materially alter the way the river functions in its social context. Consequently, there would be no

impact related to physical division of an established community, and no mitigation is necessary.

b. *Cause a significant environmental impact due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?* ***No impact.***

As noted in the Setting section land use planning in the Project area is guided by the Napa County General Plan. Goal CON-1 in the General Plan Conservation Element stresses resource conservation based on determining appropriate land uses and minimizing conflict with the natural environment and "the agriculture it supports." Under Goal CON-1, Policy CON-1 further stipulates that the County "will preserve land for greenbelts, … flood control, … habitat for fish, wildlife and wildlife movement, native vegetation, and natural beauty," and will "encourage management of these areas in ways that promote wildlife habitat renewal, diversification, and protection." The proposed Project, which is intended to support long-term sustainable restoration of the Bale Slough – Bear Creek function, geomorphology, and riparian and aquatic habitat value, is explicitly consistent with this fundamental General Plan goal and policy.

Through its emphasis on improving riparian habitat, the proposed Project addresses the following additional goals from the Conservation Element.

- Goal CON-2: Maintain and enhance the existing level of biodiversity.
- Goal CON-3: Protect the continued presence of special-status species, including special-status plants, special-status wildlife, and their habitats, and comply with all applicable state, federal, or local laws or regulations.
- Goal CON-4: Conserve, protect, and improve plant, wildlife, and fishery habitats for all native species in Napa County.
- Goal CON-5: Protect connectivity and continuous habitat areas for wildlife movement.

Several policies in the Conservation Element are specific about the importance of the Napa River and the County's fisheries resources, stressing stream health, fisheries resources, and the need for environmentally sensitive flood protection:

- Policy CON-10: The County shall conserve and improve fisheries and wildlife habitat in cooperation with governmental agencies, private associations and individuals in Napa County.
- Policy CON-11: The County shall maintain and improve fisheries habitat through a variety of appropriate measures, including the following as well as best management practices developed over time:

    - (d) Encourage and support programs and efforts related to fishery habitat restoration and improvement including steelhead presence surveys, development and utilization of hydraulic modeling, and removal of fish barriers.
    - (e) Manage the removal of invasive vegetation and the retention of other riparian vegetation to reduce the potential for increased water temperatures and siltation and to improve fishery habitat.
- Policy CON-46: Napa County's past, present, and future are intertwined with that of the Napa River; therefore, the County is committed to improving and sustaining the health of the river, through attaining water quality and habitat enhancement goals … and completing federal, state, and local flood control projects that are consistent with 'living rivers' principles.
- Policy CON-50: The District will take appropriate steps to protect surface water quality and quantity, including the following:
    - (b) Encourage flood control reduction projects to give full consideration to scenic, fish, wildlife, and other environmental benefits when computing costs of alternative methods of flood control.

The Project would improve diversity, complexity, and overall quality of instream habitat and thus would benefit fisheries resources, consistent with Policies CON-10, CON-11, and CON-46. Its emphasis on reducing catastrophic flood hazard by restoring natural channel and floodplain function and habitat value speaks to Policy CON-50 as well.

The Project area and its surrounds are designated as Agricultural Resource lands in the current County General. Although it would require the permanent conversion of a comparatively small amount (3,1 acres)of land currently in vineyards, because the Project is expected to reduce risks of flooding in adjacent vineyard lands, it would not be in conflict with the AR zoning or with adjacent agricultural uses. The Project's approach is also consistent with Goal SAF-1 and Policy SAF-24 in the General Plan Safety Element, which recognize the flood conveyance capability of agricultural lands:

- Goal SAF-1: Safety considerations will be part of the District's education, outreach, planning, and operations in order to reduce loss of life, injuries, damage to property, and economic and social dislocation resulting from fire, flood, geologic, and other hazards.
- Policy SAF-24: The District recognizes that agricultural open space also serves a valuable purpose in promoting safety, and that maintaining areas subject to flooding in agricultural or open space uses minimizes the impacts of flooding on homes and businesses.

The Project would be exempt from the County Conservation Regulations' setback requirements because it (1) would not result in the construction of structures, and (2) would be required to obtain state and federal permits through processes protective of natural resource values.

The proposed Project, which emphasizes restoring and improving habitat value, while reducing flood risks through improved stream function is thus consistent in spirit and in detail with numerous General Plan Goals and Policies and with applicable County land use and planning codes. There would be no impact related to conflicts with land use plans, policies, or regulations, and no mitigation is required.

XII. Mineral Resources

Would the project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				x
b.	Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				x

1. Setting

The Project area is not within a mapped aggregate resource area. According to the USGS Mineral Resources Data System, there are no known mineral occurrences, prospects, or past or present mineral producers within or immediately adjacent to the Project area.[13]

2. Impacts

a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? ***No impact.***

As noted above, no known mineral resources of importance to the state or region are located on site. Therefore, the proposed Project would not result in the loss of availability of mineral resources, or otherwise interfere with the extraction of existing mineral resources. No impact would occur.

b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? ***No impact.***

No locally important mineral resource recovery sites are delineated for the Project area, including in a general plan or other land use plan.

[13] U.S. Geologic Survey, *Mineral Resources Data System (MRDS), Mineral Resources On-Line Spatial Data*,available http://mrdata.usgs.gov/mineral-resources/mrds-us.html. Accessed 4/10/2017.

XIII. Noise

Would the project result in:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			x	
b.	Generation of excessive groundborne vibration of groundborne noise levels?			x	
c.	For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not= been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				x

1. Setting

Acceptable noise levels in unincorporated areas of Napa County are established in Title 8 of the County Code of Ordinances. The Ordinance states that where technically and economically feasible, construction activities shall be conducted in such a manner that the maximum noise levels at affected properties will not exceed those listed in the following schedule:

Table 17. Napa County Noise Limits for Construction Activities

Time Period	Residential	Commercial**	Industrial
Day (7 am- 7pm)	75 dBA	80 dBA	85 dBA
Night (7 pm-7 am)*	60 dBA	65 dBA	70 dBA

* Construction generally not permitted at night

**A winery (i.e., tasting room, point of sale) is considered a commercial use

Table 18 details typical construction equipment noise levels as measured 50 feet from the source, according to the Federal Highway Administration. Equipment that would be used for project construction activities is listed.

Table 18. Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level 50 feet from Source (dBA)
Tractor	84
Aerial boom lift	75
Excavator	81
Dozer	82
Chain saw	84
Plate compactor	83
Scraper	85
Haul truck	76

Source: Federal Highway Administration 2006
(http://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/rcnm.pdf)

The County Noise Ordinance further prohibits the use of equipment used in construction, drilling, repair, alteration, or demolition work between the hours of 7:00 a.m. and 7:00 p.m. to prevent construction-related noise from disturbing residential or commercial property owners.

Environmental Setting

Noise conditions in the Project area vary greatly based on local land uses. Noise sources near the Project site include traffic along Highways 29 and 128, the Wine Train, and agricultural noise sources (tractors and harvesters are the primary agricultural noise sources). Noise levels at the Project site are typical of Napa Valley agricultural areas.

2. Impacts

a. Generation a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? ***Less than significant impact****.*

As described in Chapter 3 (*Project Description*), construction is expected to be phased over a period of 3 years, and no more than 2 of the Project restoration sites would be under construction at any one time. Construction of each Project phase is expected to occur over a maximum 6- to 7-month timeframe, and work would be limited to weekdays. Additionally, Project features (e.g., earthen berms, inset floodplain benches/slopes) will be dispersed throughout the approximately 3-mile Project area and, for the most part, are not concentrated in one single location. However, noise from operation of construction equipment could affect sensitive receptors (e.g., residences, wineries) in the Project vicinity.

Construction noise sources would include a variety of heavy equipment and other machinery. An inventory of construction equipment and associated noise levels are presented in Table 18. The location of sensitive receptors was mapped (Google Earth 2021).

There are 7 residences outside the Project area that are within 1,000 feet of a Project site. Four residences on Rutherford Road are within 800-1,000 feet of Site 1 and three residences on Mee Lane are within 900-1,000 feet of Site 11 as well as the easternmost part of the Group C sites. The nearest residence to a Project site is on Rutherford Road. It is approximately 800 feet from Site 1. The noisiest piece of equipment operating at this site would generate a noise level of 85 decibels (dBA) at 50 feet from the piece of equipment when it is operating. Construction-generated noise levels drop off at a rate of about 5 dBA per doubling of distance between the source and receptor. Shielding provided by buildings or terrain results in lower construction noise levels at more distant receptors. At 800 feet from Site 1, the maximum noise generated by equipment would be approximately 65 decibels (dBA). This is within the Noise Ordinance's acceptable noise level for daytime operations. Therefore, noise levels at the other 6 residences that are further from a construction site than 800 feet would also be acceptable levels for daytime operations.

There are two commercial operations west of Highway 29 that are within 1,000 feet of a Project site. One is about 500 feet south of the Group C site and one is about 600 feet northwest of the easternmost part of Group C site. In both cases, the maximum noise level at these receptors would be below 70 decibels (dBA). This is within the Noise Ordinance's acceptable noise level for daytime operations.

There are also two other commercial receptors within 1,000 feet of the Project sites that are owned by landowners initiating this Project. Given that they are initiating the Project and understand the work needed to complete the Project, noise affecting their businesses is considered acceptable for daytime operations.

Truck traffic to and from the construction sites could also have the potential to create additional noise for residences and commercial establishments located along haul routes. Thus, there is some potential for levels at the nearest noise-sensitive locations to exceed the County noise ordinance noise. However, the truck routes do not pass residences until they reach Highway 29 or Rutherford Road. Additional truck traffic on Highway 29 would not generate significant noise given the ambient noise level for vehicles traveling along that Highway. In addition, construction noise levels described above reflect a conservative condition where the loudest pieces of equipment are assessed. In reality, construction activities would be intermittent and short term. Additionally, construction noise levels are well within the range of existing noise levels in the Project area associated with typical farming activities (average of approximately 84 dBA) and winery operations (range of between 52 and 87 dBA).

Nonetheless, there is still some potential for significant short-term construction-related noise impacts where construction occurs in close proximity to local residences and commercial establishments. To reduce impacts on sensitive land uses as much as possible, the District will implement Environmental Commitment e EC-14, which will ensure notification of residences and noise attenuation measures to reduce noise to the extent feasible. With these measures in effect, impacts would be reduced to the extent feasible and are expected to be less than significant. No mitigation is required.

b. *Would the project result in generation of excessive groundborne vibration or groundborne noise levels?* ***Less than significant impact****.*

The Project includes construction activities that may locally generate groundborne vibration and noise. These levels would not be significant because they would be short-term and temporary and would be limited to daytime hours. Vibration from ground-disturbing construction activity is typically below the threshold of perception when the activity is more than 50 feet from the receiver. There are no other activities or uses associated with the Project that would expose persons to or generate excessive ground borne vibration or ground borne noise levels. The Project will not result in permanent, long-term exposure of people to excessive ground borne vibration or noise levels.

c. *For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels****? No impact.***

The proposed Project is not located within an airport land use plan area or within 2 miles of any public airport or private airport or airstrip. Therefore, there would be no impact related to airport noise exposure, and no mitigation is required.

XIV. Population and Housing

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				x
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				x

1. Setting

There are no residences on the Project site.

2. Impacts

a. Induce substantial unplanned population growth in an area, either directly (for example, by *proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?* ***No impact*****.**

The Project involves restoration of a slough/stream channel. The proposed Project would not involve or result in any new housing, business, or industrial developments that could result in population growth. Therefore, no impact would occur.

b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? ***No impact.***

The proposed Project would involve construction of stream restoration elements. It would not result in the demolition of existing housing, or otherwise cause a reduction in housing units on site or elsewhere. Therefore, no impact would occur.

XV. Public Services

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Fire protection?				x
Police protection?				x
Schools?				x
Parks?				x
Other public facilities?				x

1. Setting

Fire Protection

The County of Napa contracts with the California Department of Forestry (CAL FIRE) for fire protection services as the Napa County Fire Department. CAL FIRE provides administrative support and coordination with six full-time paid stations and nine volunteer fire companies operating under a County Fire Plan, which is approved by the County Board of Supervisors. The County contracts with the cities of St. Helena and Calistoga, and Schell-Vista Fire Protection District for the provision of fire protection services to specified unincorporated areas adjoining these agencies.

Police Protection

The primary responsibility for law enforcement and police services in the County rests with the Napa County Sheriff's Department (NCSD), which operates five stations, located in Napa, Yountville, St. Helena, Angwin, and Lake Berryessa. NCSD also has mutual aid agreements with several other law enforcement agencies, including the St. Helena Police Department, City of Calistoga Police Department, City of Napa Police Department, Vallejo Police Department, and California Highway Patrol.

Schools

There are five main school districts in Napa County: Napa Valley Unified School District, St. Helena Unified School District, Calistoga Joint Unified School District, Howell Mountain Elementary School District, and Pope Valley Union Elementary School District.

Parks

There are no federal, state, or county parks near the Project site.

2. Impacts

a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: ***No impact.***

The proposed Project would not increase population in the Project area (see related discussion in the Population and Housing section of this Initial Study), Accordingly, it would not increase the demand for police services, schools, or parks over long term.

The proposed Project focuses on restoring and enhancing slough/stream junction and habitat value along the Bale Slough – Bear Creek; it would not construct buildings or other structures and thus would not add to the existing urban fire protection need or responsibilities in the County. Since the Project area is already a quasi-natural riparian corridor, the Project would not materially alter the need for wildland fire protection.

There would be no impact related to any need to provide additional public services, and no mitigation is required.

XVI. Recreation

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				x
b.	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				x

1. Setting

There are no public parks or recreational areas within the proposed Project; the proposed Project would occur entirely within privately owned property.

2. Impacts

a. *Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?* ***No impact****.*

As discussed in the Population and Housing section of this checklist, the proposed Project is not expected to result in either short- or long-term population growth in the Project area, so it would not result in increased recreational demand related to population growth. It would not modify or otherwise affect existing recreational facilities or resources, and thus is not expected to alter patterns of recreational demand or usage. No impact related to increased use of existing recreational facilities is anticipated, and no mitigation is required.

b. *Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment****? No impact.***

The proposed Project is entirely within private property and does not include a recreational component, and it would not require the construction of new recreational facilities or expansion of existing facilities. There would be no impact related to new recreational facilities, and no mitigation is required.

XVII. Transportation

Would the project result in:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Conflict with program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?			x	
b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?			x	
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?		x		
e. Result in inadequate emergency access?			x	

1. Setting

Public access to the Project site is via Highway 29 and Highway 128 (Rutherford Road). Rutherford Road is a two-lane roadway between its intersection with Highway 29 and the Project site. Highway 29 is a two-lane highway with a middle turn lane as it passes Rutherford Road. Further north where the highway passes the northern haul road intersection with the highway, it is a two-lane road. Highway 29 becomes a four-lane divided freeway just north of Yountville.

2. Impacts

*a. Conflict with program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities**? Less than significant impact.***

Construction would generate four types of traffic: construction worker commute vehicles, mobilization and demobilization of heavy construction equipment, delivery of materials and supplies, and hauling of sediment and soil between work sites and for offsite disposal. Maintenance operations would result in additional, but much more infrequent, trips within the same general categories.

Construction Worker Trip Generation

As described in Chapter 3, Project construction is expected to be phased over a period of 3 years. The work at the 14 sites would be sequential. Under this scenario, it is estimated that 15 or fewer workers would be onsite during construction at any one time. Construction of

each group of sites is expected to occur over a maximum 6- to 7-month timeframe and work would be limited to weekdays. Over the construction period, it is estimated that construction worker vehicles would add approximately 30 trips to area roadways each day.

Heavy Equipment Deliveries

Construction equipment would be staged onsite, meaning that once onsite, equipment would remain onsite until construction has been completed. Transportation of equipment to (mobilization) and from (demobilization). Additional trips would be generated by delivery of materials and supplies (e.g., plant material, irrigation pipes), which would likely occur several times per week, up to 1 round trip per day (2 individual trips).

Truck Trips Associated with Disposal of Excess Materials or Delivery of Fill for Bank Stabilization

The proposed Project activities at sites on Group A and Group B would generate approximately 26,500 cubic yards of material that would not be reused at the sites. Reconstruction of the Group C floodplain will remove 35,000 cubic yards of material that will be moved onto an adjacent private property to be used for enhancing the vineyard capability of that site. Hauling soil from Group C would not require haul trucks to use public roadways. The approximately 26,500 cubic yard of excess cut material from Groups A and B would be hauled offsite in 10-cubic-yard dump trucks for various uses including general fill for nearby construction projects and soil for vineyard operations. If enough local off-haul sites are not available to take all the cut material, then it is expected that the excess would be hauled to the Napa Pipe property in American Canyon (to account for a worst-case scenario for length of hail truck trips, it is assumed that all excess material would be hauled to the Napa Pipe site0. This property is an old industrial site that is being prepared for new commercial and other development. This off-hauling would result in approximately 280 round trips (560 individual haul trips) to remove excess materials over the life of construction. Earth-moving activities would occur over a total of approximately 360 days (6-month construction period) over the 2-year construction timeframe for Groups A and B. Therefore, up to an average of approximately 15 individual haul trips (7-8 trips in and 7-8 trips out) would occur per day (weekdays during the 6-month construction duration for the two groups of sites, over a total of 2 years).

Maintenance

Project maintenance activities would generate limited amounts of traffic (2−3 vehicles) to and from each of the maintenance sites, and most activities would not require the mobilization and demobilization of heavy equipment. Maintenance activities and locations would vary each year based on need, and most activities would be accomplished within a relatively short time frame (2−3 days). Therefore, the added volume of traffic generated on

area roadways by routine maintenance is expected to be very small relative to roadway capacity and existing traffic volume.

Summary

Up to approximately 47 individual daily trips would be generated by Project construction from a combination of construction worker commute vehicles, mobilization and demobilization of heavy construction equipment, delivery of materials and supplies, and hauling of sediment and soil. This represents a small proportion (far less than 1 percent) of daily traffic volume capacity on the two highways that would be affected.

CEQA no longer requires an assessment of Project traffic on roadway congestion (i.e., effect on Level of Service). In any case, the increase of Project maintenance-related vehicles would be minor relative to the capacity of roadways and would not be expected to affect the LOS on the two highways. Therefore, the short-term and minor traffic impacts of constructing the Project would not be expected to conflict with a program, plan, ordinance, or policy addressing the circulation system.

b. *Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?* ***Less than significant impact.***

The Project would not generate new trips once construction is completed other than a few trips per year for monitoring and maintenance. OPR's Technical Advisory on Evaluating Transportation Impacts in CEQA (September 2017) states that projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact. The number of new trips generated by the Project would be well below the screening criterion for such projects. Therefore, the Vehicle Miles Travelled (VMT) impact would be less than significant.

c. *Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment****)? Less than significant with mitigation incorporated.***

The proposed Project would not alter the physical configuration of the roadway network or introduce unsafe design features or incompatible uses into the area. Therefore, there would be no long-term impacts on roadway or intersection safety as a result of the Project. During Project construction, slow-moving construction vehicles entering and leaving the Project site could result in a short-term increase in traffic safety hazards. Additionally, emergency access within the Project area could be affected by Project construction traffic; specifically, temporary lane closures and construction-related traffic could delay or obstruct emergency vehicles. Any of these impacts would be considered potentially significant if they were to occur.

Work would be staged and conducted in a manner that maintains two-way traffic flow on Highway 29 and Highway 128 (Rutherford Road)s in the vicinity of the work site. It is not expected that lane closures would be required for delivery of equipment and materials. It is also not to be needed for haul trucks entering the Project site. However, it is possible that haul trucks turning left from Rutherford Road and/or the northern on-site haul road onto Highway 29 could slow southbound traffic on the highway. It is not expected that experienced drivers of haul trucks turning left onto Highway 29 would cause conflicts with vehicles traveling north on the highway since the drivers are familiar with the acceleration rate of their trucks so they can avoid accidents with north-travelling vehicles. However, this could be a potentially significant traffic safety impact.

Though lane closures will not likely be needed, it is possible that occasional temporary lane closures on area roadways may be necessary for construction staging and equipment mobilization/demobilization activities. Lane closures on area roadways during peak hours could result in in severely limited traffic circulation on Highway 29 In addition, lane closures could result in inadequate travel routes for cyclists and pedestrians and impair public transit routes and pickup/drop-off locations for transit riders.

Though lane closures associated with Project construction would be temporary, closures during peak hours on impaired roadways could result in significant circulation impacts over the 3-year construction period. To mitigate this potentially significant impact, the District has proposed Environmental Commitments EC-12 and EC-13, which, among other benefits, would require work to be staged and conducted in a manner that maintains two-way traffic flow on public roadways to the maximum extent feasible. Nevertheless, the left-turning haul trucks pose a potentially significant traffic safety impact.

Mitigation Measures

Mitigation Measure TR-1: Prepare and Implement a Traffic Control Plan.

The District of Napa shall ensure preparation and implementation of a Traffic Control Plan for construction and maintenance activities of the proposed Project. At a minimum, the Plan shall require:

- Slow-moving vehicles to travel outside of peak hours on Highway 29,
- Coordination with the District to design a congested intersection avoidance strategy for the intersections of Highway 29 and Highway 128 and the northern onsite haul route, and
- Coordination with Caltrans to revise the Traffic Control Plan if warranted.

Mitigation Monitoring and Reporting

Mitigation Measure TR-1 would require the Project to include provisions to ensure unobstructed emergency access and overall traffic safety. The District will add this mitigation to the draft Mitigation and Monitoring Program contained in Appendix F. And be responsible for overseeing implementation of the plan.

Impact Significance After Mitigation

Implementation of this mitigation would reduce the potential short-term impacts on traffic safety to a less-than-significant level.

*d. Result in inadequate emergency access**? Less than significant impact.***

Constructing the Project would not affect emergency access to the Project site. In case of an emergency involving a worker on the site, there are ample emergency access routes across or around the perimeter of the adjacent vineyards to all adequate emergency access.

XVIII. Utilities and Service Systems

Would the project:		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Require or result in the relocation or construction of new or expanded water, wastewater treatment facilities, or storm water drainage, electric power, natural gas, or telecommunications facilities or expansion of existing facilities, the construction or relocation of which could cause significant environmental effects?				x
b.	Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?				x
c.	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				x
d.	Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?			x	
e.	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?				x

1. Setting

Water Supply, Wastewater Disposal*, and Sanitary Sewers*

Unincorporated areas of the County are primarily reliant upon groundwater resources and surface water collection for potable water. Based on current and future water demands, the County has adopted polices supporting the use of recycled water as a means to meet future water supply demands.

The proposed Project would not affect water or wastewater demands or capacity needs. As such, these public facilities are not discussed in this setting section.

Stormwater Drainage

The Project area is not served by City or County storm drain infrastructure. Information on stormwater drainage in the Project area is provided in the Hydrology and Water Quality section of this checklist.

Solid Waste Disposal

The majority of materials other than sediment would be taken to the Devlin Road Recycling and Transfer Facility where most of the County's solid waste is sorted and routed for disposal elsewhere. This facility is located at 889 Devlin Road in American Canyon. The Devlin Road Transfer Station is also the site of the American Canyon Landfill. .

2. Impacts

*a. Require or result in the relocation or construction of new or expanded water, wastewater treatment facilities, or storm water drainage, electric power, natural gas, or telecommunications facilities or expansion of existing facilities, the construction or relocation of which could cause significant environmental effects**? No impact.***

The proposed Project will require porta-potties during construction. No new permanent wastewater, water, storm drains electric power, natural gas or telecommunications facilities would be constructed. Therefore, there would be no potential for significant impacts from constructing new infrastructure facilities.

*b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years? **No impact**.*

A permanent potable water system would not be provided to the site. The Project contractor will be responsible for providing potable water to workers.

*c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments**? No impact**.*

Wastewater from porta-potties will be pumped out on a regular basis and disposed of at a permitted wastewater treatment facility that has capacity to accept hauled septage. The small amount of wastewater generated by porta-potties would not be expected to adversely affect the capacity of the receiving facility.

*d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? **Less than significant impact**.*

As discussed above, the proposed Project would not increase area population, relocate residential uses, or otherwise alter land use in a way that would increase residential or commercial solid waste generation. In order to prepare the proposed restoration areas for earthwork, some vegetation would need to be removed. It is expected that most trees and other vegetation to be removed will be reused on the site as part of site restoration. Any

vegetation that is not reused would be hauled to a recycling facility (likely the Devlin Road site in American Canyon.

The proposed Project activities (e.g., channel widening, floodplain restoration, instream features) would generate approximately 26,500 cubic yards of soil that will be hauled from sites in Groups A and B to Rutherford Road and/or Highway 29. The soil would be hauled to a site that is permitted to receive such soil. As a worst case, the site is expected to be the Napa Pipe site; this is a 154-acre former industrial site located along the Napa River south of Kennedy Park. It is possible that some or much of this soil would be used locally for construction projects or vineyard use.

Approximately 35,000 cubic yards of excavated soil from the lower section of Group C will be delivered to a vineyard of Treasury Wine Estates America Company that abuts what will be the new floodplain.

Following restoration, small volumes of green waste would continue to be generated periodically as a result of vegetation maintenance activities, including the removal of invasive nonnative species. Most or all of this material would be off-hauled for composting, so it would not require disposal per se, and the volumes involved would be quite small, well within the capacity of local receiving facilities.

Overall, the Project's potential to increase waste generation would be very small. Project-related waste volumes could easily be accommodated as part of the Project area's existing waste stream. Furthermore, wastes (primarily green waste) generated by the proposed Project would be handled and disposed in accordance with all applicable federal, state, and local regulations and policies. The proposed Project is not expected to exceed landfill capacity or result in impacts related to violation of solid waste regulations, and no mitigation is required.

e. *Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?* ***No impact.***

The proposed Project construction would comply with all applicable regulatory requirements related to solid waste. Specifications for Project construction would contain requirements for the handling, storage, cleanup, and disposal of any hazardous materials, or other construction pollutants. This impact is considered less than significant.

XIX. Wildfire

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?			x	
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?				x
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?				x
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?				x

1. Setting

The Project site is a slough/stream channel that passes mainly through developed vineyards and wineries. CALFIRE's Fire Hazard Severity Map for Napa County identifies the Project reach and the surrounding area as being within the "Not-Very High Fire Hazard" zone.

2. Impacts

a. Substantially impair an adopted emergency response plan or emergency evacuation plan? ***Less than significant impact.***

During Project construction, some of the excess cut material will be off-hauled from the project site onto two State highways (Highways 29 and 128). The slower moving haul trucks could cause congestion as the trucks are accelerating. Once the trucks are up to speed; they would not pose a substantial obstacle for emergency response vehicles. Mitigation Measure T-1 would address this impact This would be a short-term impact occurring during the dry season over a three-year period. The construction phase may be sequential but each of the three phases is dependent on grant funding, so the construction phases could occur over a longer stretch of time.

It is expected that construction would not be occurring during periods when major wildfires are burning in the ridges west and east of the Project site. So, trucks hauling soil off the site would not be expected to be operating when evacuation of residents fleeing a wildfire or other catastrophe is occurring. Given Mitigation Measure T-1 plus the unlikely operation of haul trucks during periods when evacuation may be required would reduce the short-term impact to a less-than-significant level.

b. *Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?* ***No impact.***

The Project would restore an historic slough, creek, and floodplain. Therefore, the Project would not exacerbate wildfires in this "Not-High Fore Hazard Severity" zone. There would be no new occupants of the Project site, so there would be no potential for pollutant exposure.

c. *Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? No impact.*

The Project will not include building new structures or infrastructure that would burn if a wildfire crossed onto the site. No new infrastructure is required to protect site resources from a wildfire. Accordingly, no additional fire-related infrastructure would be built, and there would be no impacts on the environment from such construction.

d. *Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?* ***No impact.***

No residences will be constructed on the site, so they would not be subject to flooding or landslides. The site is level, so any people on the site would not be subject to landslides, plus it is expected the Project would be closed to the public if there was a risk from post-fire flooding or landsliding. Accordingly, there would be no impact from the potential ramifications of a wildfire in the area.

XX. Mandatory Findings of Significance

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
b.	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?		x		
c.	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		x		

*a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory**? Less than significant with mitigation incorporated.***

Restoration elements and features of the Project include a suite of restoration approaches are designed to achieve restoration goals and objectives, including: setting back earthen berms from the top of the river bank; creating vegetated buffers between the stream and adjacent land uses; creating more complex habitat to provide high-flow refugia for native fish; installing instream structures to improve aquatic habitat; removing non-native invasive and Pierce's disease host plants; planting native understory species; and installing biotechnical bank stabilization to stabilize actively eroding banks. The Project will also include an annual maintenance and monitoring program funded by landowner assessments which addresses bank erosion, debris removal, downed tree stabilization/relocation, invasive and Pierce's Disease host plant management and repair (as needed) of instream habitat structures and features.

The stream and slough are classified as a water of the United States, as well as being potential habitat for several special-status species of fish and wildlife. However, as explained in Section IV, Biological Resources, the proposed Project contains a number of mitigation measures to reduce the potential for direct and indirect effects to individuals of these species to a level that is less than significant. The stream restoration will enhance the habitat value of the site by including new plantings of native species and providing more diverse habitat.

The Project would not result in significant adverse impacts to biological resources. As summarized above, the Project would have long-term beneficial impacts on biological resources and site habitat.

As discussed for potential impacts to cultural resources, there are no known historical resources, archaeological resources, or tribal cultural resources in the Project area. With the implementation of recommended mitigation measures, potential impacts to inadvertently discovered archaeological resources, tribal cultural resources or human remains would be a less-than-significant level.

b. *Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects****)? Less than significant with mitigation incorporated.***

Cumulative environmental effects are multiple individual effects that, when considered together, are considerable or may compound or increase other environmental impacts. The proposed Project is restoration of a stream/slough channel and floodplain.

Long-term impacts of the proposed Project would be beneficial. The proposed Project would not have long-term impacts. The short-term construction impacts would all be reduced to a less-than-significant level by Implementation of the Project Environmental Commitments and the mitigation measures required in this Initial Study. The long-term effects of the Project would be beneficial as it would restore the Project site to a natural waterway and riparian corridor and decrease flooding. The Project would re-establish floodplain and natural geomorphic and hydrologic processes in the Project reach; increase and enhance ecological function, fish and riparian habitat; 3) stabilize eroding banks to reduce fine sediment inputs and minimize the need for ongoing channel work; remove non-native/invasive vegetation; improve seasonal wetland hydrologic processes; and protect adjacent agricultural property.

These benefits would offset any on-site or offsite construction-related impacts on air quality and GHG emissions. The Project's air quality impacts would be limited to the construction period. Temporary construction-related air quality and GHG emissions would be minimized through the adherence to BAAQMD standards and requirements, and BAAQMD Basic Construction Measures. As described in Section III, Air Quality, the proposed Project would not result in a cumulatively considerable net increase in criteria air pollutants. The analysis of greenhouse gas emissions is inherently a cumulative analysis (with the geographic scope of the impact being the global climate). As described in Section VII, the proposed Project would not result in significant impacts related to greenhouse gas emissions. As explained in Section IV, Biological Resources, the proposed Project would implement Project-proposed biological mitigation measures so that the Project would have less-than-significant impacts on special status species, riparian habitat or other sensitive natural communities, and migration of species. Therefore, the proposed Project would not contribute to any cumulative impact for these resources. The cumulative impacts would be less than significant.

c. *Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?* ***Less than significant with mitigation incorporated.***

The proposed Project involves restoration of a stream and slough. It would take place in an area that is not accessible to the general public and that involves no changes in the landscape, land uses, services, or other aspects of human activities. All potential environmental impacts on human beings identified in support of the proposed Project would be minimal or less than significant without mitigation. All potential hazards and hazardous materials impacts would be minimized. Traffic safety impacts would be reduced by implementing traffic control mitigations. There would be no long-term impact on traffic or traffic safety. It would not cause changes in the environment that have any potential to cause substantial adverse direct or indirect effects on human beings.

5.0 Determination

On the basis of this initial evaluation:

I find that the proposed project could not have a significant effect on the environment and a Negative Declaration will be prepared.	
I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the applicant. A Mitigated Negative Declaration will be prepared.	X
I find that the proposed project may have a significant effect on the environment, and an Environmental Impact Report is required.	
I find that the proposed project may have a "potentially significant impact" or "potentially significant unless mitigated impact" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An Environmental Impact Report is required, but it must analyze only the effects that remain to be addressed.	
I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or Negative Declaration pursuant to applicable standards and (b) have been avoided or mitigated pursuant to an earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.	

_____ _____

Signature Date

6.0 Report Preparers

Leonard Charles and Associates

- Leonard Charles, Ph.D., Project Manager and Environmental Analyst
- Lynn Milliman, M.A., Environmental Analyst
- Jacoba Charles, M.A. & M.S., Biologist and Environmental Analyst

Questa Engineering (Project Engineers, Geology, and Hydrology)

- Syd Temple, P.E. Principal
- Margaret Henderson, ASLA, Principal Restoration Planner
- Will Hopkins, P.G. Geologist
- Syd Temple, Hydrology/Water Quality

Geoff H. Hornek Environmental Air Quality and Acoustical Consulting

- Geoff Hornek, Air Quality, GHG, and Energy Analysis

Kleinfelder/GANDA (Biological Resources)

- Lisa Achter (Senior Wildlife Biologist)
- Sumudu Welaratna (Ecologist)

Basin Research Associates (Cultural Resources)

- Colin Busby, Ph.D., Managing Principal

Napa County Flood Control and Water Conservation District

- Jeremy Sarrow, Watershed and Flood Control Resources Specialist

Appendices

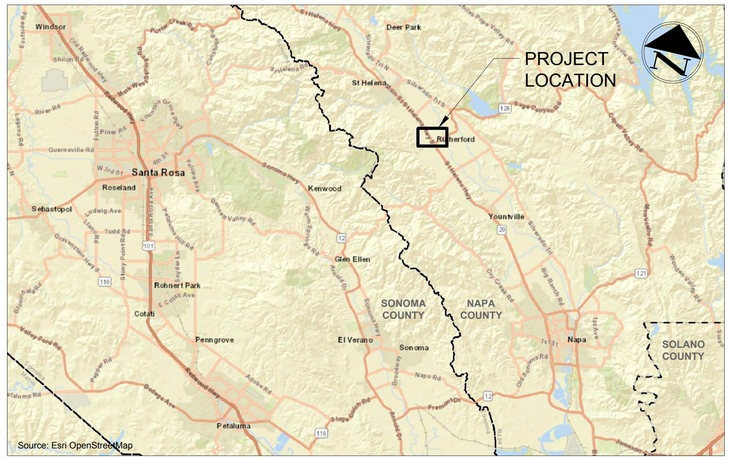
Appendix A

Project Drawings

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT - GROUP A

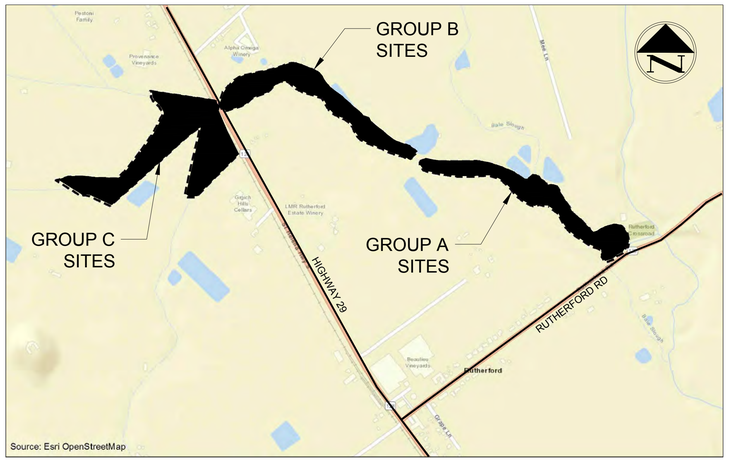
NAPA COUNTY, CA

65% DRAFT DESIGN PLANS



PROJECT LOCATION MAP

NO SCALE



PROJECT VICINITY MAP

NO SCALE

SHEET INDEX

Sheet Number	Sheet Title
1	TITLE SHEET
2	GROUP A OVERVIEW
3	SITE PREPARATION PLAN - REACH 1
4	SITE PREPARATION PLAN - REACH 2
5	SITE PREPARATION PLAN - REACH 3
6	GRADING PLAN - REACH 1
7	GRADING PLAN - REACH 2
8	GRADING PLAN - REACH 3
9	GRADING SECTIONS
10	GRADING DETAILS
11	GRADING DETAILS
12	PLANTING PLAN - REACH 1
13	PLANTING PLAN - REACH 2
14	PLANTING PLAN – REACH 3
15	PLANTING DETAILS

GENERAL NOTES

1. DESIGN INTENT: THESE PLANS AND SPECIFICATIONS REPRESENT THE DESIGN INTENT OF QUESTA ENGINEERING CORPORATION (THE ENGINEER), AS APPROVED BY THE NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT DEPARTMENT. THE CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS SHOWN ON THESE PLANS AND SPECIFICATIONS AND SHALL BE RESPONSIBLE FOR ANY DEVIATIONS FROM THESE PLANS AND ASSOCIATED RISK AND EXPENSE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A COPY OF THE APPROVED PLANS AND SPECIFICATIONS AND ANY ADDENDA AT THE JOB SITE AT ALL TIMES. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY UNFORESEEN CIRCUMSTANCES OR CONDITIONS THAT WOULD ALTER THESE PLANS AND SPECIFICATIONS FOR APPROVAL OF MODIFICATIONS TO THE INTENDED DESIGN.

2. COMPOSITE GROUND MAP: THE PROPOSED IMPROVEMENTS SHOWN ON THESE DRAWINGS ARE SUPERIMPOSED ON A BASE MAP. THIS BASE MAP IS COMPILED FROM A SURVEY, AND OTHER DATA AS MADE AVAILABLE TO THE ENGINEER, WHO SHALL NOT BE HELD LIABLE FOR CHANGES, INACCURACIES, OMISSIONS OR OTHER ERRORS ON THESE DOCUMENTS. THE COMPOSITE BASE MAP IS PROVIDED AS AN AID ONLY AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THESE DOCUMENTS AND INCORPORATING/INTEGRATING ALL CONSTRUCTION AS REQUIRED TO ACCOMMODATE THE SAME.

3. MATERIALS AND WORKMANSHIP: ALL MATERIALS, WORKMANSHIP, AND CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ~~NAPA COUNTY PUBLIC WORKS DEPARTMENT ENGINEERING STANDARD PLANS AND SPECIFICATIONS~~, AND THE CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) 2010 STANDARD PLANS AND SPECIFICATIONS UNLESS OTHERWISE NOTED. ALL MATERIAL SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.

4. PRE-CONSTRUCTION MEETING: A PRE-CONSTRUCTION MEETING SHALL BE ARRANGED BY THE CONTRACTOR AT THE JOB SITE PRIOR TO THE COMMENCEMENT OF WORK. THE MEETING SHALL BE ATTENDED BY THE OWNER, CONTRACTOR (INCLUDING SITE FOREMAN AND KEY PERSONNEL), ENGINEER, AND REPRESENTATIVES OF ANY INVOLVED REGULATORY AGENCIES. PROSPECTIVE PARTICIPANTS SHALL BE NOTIFIED OF THE MEETING A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO THE MEETING. THE PURPOSE OF THE MEETING IS TO REVIEW THE WORK PLAN AND PROVIDE CLARIFICATIONS, REVIEW JOB REQUIREMENTS, AND DISCUSS CONDITIONS OF ANY PERMITS. SPECIAL ATTENTION WILL BE PAID TO ANY WETLANDS, SOIL EROSION AND WATER QUALITY PROTECTION REQUIREMENTS. NOTICE FOR THE CONTRACTOR TO PROCEED WITH WORK SHALL BE PROVIDED AT COMPLETION OF THE PRE-CONSTRUCTION MEETING.

5. RESOURCE PROTECTION: THE CONTRACTOR IS ADVISED OF THE PRESENCE OF SENSITIVE RESOURCES LOCATED NEAR PROJECT WORK AREAS. THE TRAIL ALIGNMENT, FENCING, STAGING AREAS AND ALL OTHER PROJECT FACILITIES HAVE BEEN CAREFULLY LOCATED TO AVOID PHYSICAL DISTURBANCE OF SENSITIVE RESOURCES. ALL CONTRACTOR ACTIVITIES, INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION ACTIVITIES, VEHICLE MAINTENANCE, AND MATERIALS AND EQUIPMENT STORAGE AND STAGING, MUST BE STRICTLY CONFINED TO THE WORK AREAS SHOWN ON THE DRAWINGS. THE LIMITS OF WORK WILL BE CAREFULLY LOCATED IN THE FIELD BY THE CONTRACTOR AND ENGINEER OF RECORD, AND ALL WORK LIMIT AREAS WILL BE PROTECTED BY STRAW WATTLES, CONSTRUCTION BARRIER FENCING, AND/OR ESAISILT FENCING AS SHOWN ON THE DRAWINGS.

   CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PENALTIES AND ALL REPAIRS AND MITIGATIONS IMPOSED DUE TO BREACH OF PROTOCOL AND UNAUTHORIZED INTRUSION INTO SENSITIVE RESOURCE AREAS.

6. COMPLETION SCHEDULE: CONTRACTOR SHALL PROVIDE ENGINEER WITH A PROJECT CONSTRUCTION COMPLETION SCHEDULE WITHIN 10 WORKING DAYS OF AWARD OF CONTRACT AND REVIEW THIS SCHEDULE AND ANY CHANGES AT PRE-CONSTRUCTION MEETING. SITE IMPROVEMENTS, INCLUDING TRAIL CONSTRUCTION MUST BE COMPLETED PRIOR TO THE DATE SPECIFIED IN THE CONTRACT DOCUMENTS.

7. UTILITIES: CONTRACTOR SHALL NOTIFY ALL PUBLIC AND PRIVATE UTILITY COMPANIES IN THE PROJECT AREA A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR MUST INVESTIGATE AND VERIFY THE LOCATION OF ANY EXISTING UTILITIES WITHIN THE PROJECT AREA. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY, LOCATE, AND PROTECT ALL UTILITIES. ANY UTILITIES PLOTTED ON THE PLANS ARE CONSIDERED TENTATIVE AND APPROXIMATIONS AND THEREFORE, NO WARRANTY EXPRESSED OR IMPLIED IS MADE AS TO THE COMPLETENESS OR CORRECTION OF THEIR LOCATION. THE UTILITY COMPANIES ARE THROUGHT TO BE MEMBERS OF THE UNDERGROUND SERVICE ALERT (U.S.A.) ON-CALL PROGRAM. THE CONTRACTOR SHALL NOTIFY U.S.A. 72-HOURS IN ADVANCE OF PERFORMING EXCAVATION WORK AT 1-800-227 2600, 7:00 AM TO 5:00 PM, MONDAY THROUGH FRIDAY. EXISTING PUBLIC UTILITIES SHALL BE KEPT IN SERVICE AT ALL TIMES. UTILITIES THAT INTERFERE WITH THE WORK TO BE PERFORMED SHALL BE PROTECTED AS REQUIRED BY THE COUNTY, PG&E, AT&T, AND ALL OTHER AFFECTED AGENCIES.

8. DAMAGE AND PROTECTION OF EXISTING FACILITIES: CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING FACILITIES, AND ANY OTHER IMPROVEMENTS FROM DAMAGE FROM CONTRACTOR'S WORK, INCLUDING ALL UTILITIES, PUBLIC AND PRIVATE. CONTRACTOR SHALL EXERCISE CARE TO AVOID EXCESSIVE DAMAGE TO EXISTING PUBLIC PROPERTY, INCLUDING STREETS, PARKING AREAS, NATIVE TREES, SHRUBS, WETLANDS, AND OTHER PROPERTY IMPROVEMENTS. IF CONTRACTOR CAUSES DAMAGES TO SUCH ITEMS, THEY SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT IN LIKE NUMBER, KIND, CONDITION AND SIZE. THE COST OF REPAIRS AND REPLACEMENT OF DAMAGED PROPERTY SHALL BE AT THE CONTRACTOR'S EXPENSE. ANY SUCH COSTS MAY BE DEDUCTED BY THE CLIENT FROM MONIES DUE CONTRACTOR UNDER THIS CONTRACT.

9. JOB SITE CONDITIONS, TRAFFIC CONTROL AND CONTRACTOR RESPONSIBILITY: CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY, TRAFFIC CONTROL, AND ACCESS TO AND FROM ADJOINING DRIVEWAYS AND STREETS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD COUNTY AND THE ENGINEER (QUESTA ENGINEERING CORPORATION) HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPT FROM LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE CLIENT OR THE ENGINEER. CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING CONSTRUCTION, INCLUDING SAFETY OF PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

   ALL WORK SHALL BE IN COMPLIANCE WITH APPLICABLE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARDS AS SET FORTH BY THE FEDERAL DEPARTMENT OF LABOR AND/OR THE STATE OF CALIFORNIA. THE CONTRACTOR SHALL SECURE A TRENCH PERMIT FROM THE CALIFORNIA DIVISION OF INDUSTRIAL SAFETY (CalOSHA) PRIOR TO EXCAVATION OF ANY TRENCH GREATER THAN FIVE (5) FEET IN DEPTH.

   ALL TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CALTRANS MANUAL OF TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OF WORK ZONES. ALL SIGNS SHALL BE APPROPRIATELY CONSTRUCTED WITH REFLECTIVE MATERIAL ON A BACKING OF METAL OR FABRIC (NO WOOD OR PLASTIC ALLOWED) AND SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION TO PROVIDE PROPER VISIBILITY, PER SECTION 12 OF THE CALTRANS SPECIAL PROVISIONS.

   THE CONTRACTOR SHALL MAINTAIN REASONABLE ACCESS TO ALL DRIVEWAYS DURING CONSTRUCTION.

10. CLARIFICATION, CHANGE ORDERS, AND ADDITIONAL WORK: SHOULD ANY CONTRACTOR OR SUBCONTRACTOR FIND ANY DEFICIENCIES, ERRORS, CONFLICTS, OR OMISSIONS IN THESE PLANS AND SPECIFICATIONS, OR SHOULD THERE BE ANY DOUBT AS TO THEIR MEANING OR INTENT, THEN THE CONTRACTOR SHALL NOTIFY JOINTLY, CLIENT AND THE DESIGN ENGINEER (QUESTA ENGINEERING CORPORATION) FOR A WRITTEN CLARIFICATION, ADDENDUM, ETC. SHOULD THE CONTRACTOR FAIL TO DO SO BEFORE SUBMITTING AN INVOICE FOR ADDITIONAL WORK, THE CONTRACTOR CANNOT CLAIM ADDITIONAL COMPENSATION FOR WORK REQUIRED TO COMPLETE THE PROJECT. THE EXCEPTION IS EMERGENCY WORK AS DEFINED IN THE CALTRANS STANDARDS.

    THE CLIENT OR ENGINEER OF RECORD, ACTING ON BEHALF OF THE CLIENT, MAY REQUIRE PLAN REVISIONS DUE TO UNFORESEEN CIRCUMSTANCES AND CONFLICTS OCCURRING DURING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY, JOINTLY THE CLIENT AND THE ENGINEER OF RECORD OF ANY SUCH WORK THAT IS ADDITIONAL AND SUBMIT A WRITTEN COST-ESTIMATE FOR SUCH WORK. "EXTRA WORK" AND WRITTEN CHANGE ORDERS WILL BE EXECUTED UPON THE RECOMMENDATION OF THE ENGINEER.

11. PAYMENTS: PAYMENT SHALL BE BASED ON COMPLETED CONTRACTOR'S BID SHEET AND ISSUED WRITTEN CHANGE ORDERS. THE ENGINEER OF RECORD SHALL VERIFY FIELD MEASUREMENTS AND CONTRACTOR QUANTITY ESTIMATES, WHERE APPLICABLE, AND UNLESS OTHERWISE NOTED.

12. MISCELLANEOUS: WRITTEN DIMENSIONS ALWAYS TAKE PRECEDENCE OVER SCALED DIMENSIONS IF THERE IS A CONFLICT. THE CONTRACTOR SHALL CONTACT THE ENGINEER TO OBTAIN ADDITIONAL CLARIFICATION. NO DEVIATION OR SUBSTITUTION SHALL BE ALLOWED WITHOUT OBTAINING PRIOR WRITTEN APPROVAL FROM THE ENGINEER.

13. EROSION CONTROL: EROSION CONTROL SHALL BE IN ACCORDANCE WITH THESE DRAWINGS AND CONTRACTOR SHALL PREPARE A SWPPP FOR SUBMITTAL AND APPROVAL BY THE CLIENT. ALL DISTURBED AREAS SHALL BE COVERED WITH WEED-FREE STRAW TO PREVENT EROSION. SUBSEQUENTLY ALL DISTURBED AREAS SHALL BE SEEDED WITH NATIVE GRASS SEED.

14. EARTHWORK AND OFFHAUL: SUITABLE EXCAVATED MATERIAL CAN BE USED IN DESIGNATED FILL AREAS (i.e. BERMS, ISLANDS, BANK GRADING, VEGETATED MOUND AREAS. EXCESS MATERIAL SHALL BE DISPOSED OF OFF-SITE BY THE CONTRACTOR.

15. CONSTRUCTION STAGING: STAGING AREAS FOR CONSTRUCTION ACTIVITIES ARE SHOWN ON SHEET 3: SITE PROTECTION, DEMOLITION, AND STAGING. THE CONTRACTOR IS LIMITED TO THESE AREAS UNLESS OTHERWISE NOTIFIED IN WRITING BY THE CLIENT OR ENGINEER.

ABBREVIATIONS

"T	= TREE (APPROX. ø @ BREAST HEIGHT)	GP	= GATE POST
AP	= ANGLE POINT	GR	= GROUND ELEVATION
AB	= AGGREGATE BASE	MHW	= MEAN HIGH WATER
BO	= BOTTOM OF	MLW	= MEAN LOW WATER
BOL	= BOLLARD	<N>	= NEW
BP	= BEGINNING POINT	NOM	= NOMINAL
BRC	= BACK OF ROLL CURB	<P>	= PROPOSED
CONC	= CONCRETE	P	= PAVEMENT
CD	= CHECK DAM	PT	= PRESSURE TREATED
CY	= CUBIC YARDS	S,	= SIGN
DL	= DAYLIGHT	SIM	= SIMILAR
<E>	= EXISTING	SF	= SQUARE FEET
EG	= EXISTING GRADE	SWL	= SWALE
EL	= ELEVATION	T	= TOP OF SLOPE
EOP	= EDGE OF PAVEMENT	t	= TOE OF SLOPE
EP	= ENDING POINT	TB	= TOP OF BERM
ESA	= ENVIRONMENTALLY SENSITIVE AREA	TO	= TOP OF
F	= FENCE	TOC	= TOP OF CONCRETE
FG	= FINISHED GRADE	TW	= TOP OF WALL
FL	= FLOW LINE	WLK	= WALK
GB	= GRADE BREAK		
GL	= GUTTER LIP		

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

TITLE SHEET

BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 1 OF 15

\\VALUANO\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\TITLE AND PRJ OVERVIEW SHEETS.DWG
PLOT DATE: 1/4/2021 PLOT STYLE:QUESTA-RAYSCALE-255.CTB
LAST SAVED: 8/12/2021
IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY



LEGEND:

- EXISTING CONTOUR
- PARCEL LINE
- LIMIT OF WORK
- ESA FENCING
- EXISTING TREE
- SITE ACCESS
- CONSTRUCTION ENTRANCE
- STAGING AREA

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 9/2/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\AELIAN\S\PROJECT'2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP A – SITE PREP.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GROUP A OVERVIEW

BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size: D
Project: 1900133
Scale: 1" = 40'
Date: 8/10/2021
Sheet: 2 OF 15



TREES TO BE REMOVED = 30 nos

TREE#	QTY.	SPECIES	DIAMETER
1	1	WILLOW	17
2	1	WILLOW	14
3	1	WILLOW	7
4	1	WALNUT	12
5	1	WILLOW	16
7	1	WILLOW	6
8	1	WILLOW	12
9	1	VALLEY OAK	21
35	1	COTTONWOOD	24
36	1	COTTONWOOD	18
37	1	COTTONWOOD	10
38	1	WILLOW	8
39	1	WILLOW	10
43	1	COTTONWOOD	16
44	1	COTTONWOOD	24
45	1	COTTONWOOD	16
46	1	WILLOW	24
47	1	VALLEY OAK	17
48	1	WALNUT	12
49	1	COAST LIVE OAK	8
50	1	WALNUT	14
51	1	WALNUT	12
52	1	WALNUT	14
53	1	COTTONWOOD	24
54	1	WALNUT	10
55	1	WALNUT	8
56	1	WALNUT	8
57	1	WALNUT	8
58	1	WALNUT	12
59	1	VALLEY OAK	22

LEGEND:

- 153 EXISTING CONTOUR
- PARCEL LINE
- LIMIT OF WORK
- ESA FENCING
- EXISTING TREE
- SITE ACCESS
- CONSTRUCTION ENTRANCE
- STAGING AREA

N

0 40 80 160

SCALE (FEET)

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 9/2/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\VELANUS\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP A – SITE PREP.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

SITE PREPARATION PLAN - REACH 1
STA 0+00 TO 11+50
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/10/2021
Sheet: 3 OF 15



LEGEND:

- EXISTING CONTOUR
- PARCEL LINE
- LIMIT OF WORK
- ESA FENCING
- EXISTING TREE
- SITE ACCESS
- CONSTRUCTION ENTRANCE
- STAGING AREA

N

0 40 80 160

SCALE (FEET)

TREES TO BE REMOVED=45 nos

TREE#	QTY.	SPECIES	DIAMETER
60	1	EUCALYPTUS	10
61	1	EUCALYPTUS	24
62	1	EUCALYPTUS	14
63	1	WILLOW	10
64	1	WILLOW	14
65	1	COTTONWOOD	20
66	1	COTTONWOOD	24
67	1	WILLOW	10
68	1	EUCALYPTUS	24
69	1	EUCALYPTUS	30
70	1	WILLOW	10
71	16	EUCALYPTUS	24
72	1	VALLEY OAK	8
74	7	EUCALYPTUS	24
86	1	VALLEY OAK	20
87	1	VALLEY OAK	8
88	1	WILLOW	20
89	1	EUCALYPTUS	24
90	1	WALNUT	16
91	1	BOX ELDER	12
92	1	VALLEY OAK	24
93	1	WILLOW	24
94	1	COTTONWOOD	16
95	1	VALLEY OAK	14

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

SITE PREPARATION PLAN - REACH 2
STA 11+50 TO 19+00
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/10/2021
Sheet: 4 OF 15

LAST SAVED: 8/12/2021 PLOT DATE: 9/2/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB
IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY
\\VELANUS\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP A - SITE PREP.DWG

TREES TO BE REMOVED =23 nos

TREE#	QTY.	SPECIES	DIAMETER
100	5	WALNUT	14
101	1	WILLOW	24
104	1	WILLOW	10
105	1	WILLOW	20
106	1	VALLEY OAK	20
107	1	VALLEY OAK	30
108	1	VALLEY OAK	12
112	1	VALLEY OAK	16
113	1	VALLEY OAK	20
114	1	VALLEY OAK	18
115	1	WILLOW	8
116	4	WILLOW	20
117	1	VALLEY OAK	24
118	3	WILLOW	10

LEGEND:

- 153 EXISTING CONTOUR
- PARCEL LINE
- LIMIT OF WORK
- ESA FENCING
- EXISTING TREE
- SITE ACCESS
- CONSTRUCTION ENTRANCE
- STAGING AREA

N

0 40 80 160

SCALE (FEET)

GROUP B: SITE 6

GROUP A: SITE 5

(E) BRIDGE TO REMAIN

MATCH REACH 4

MATCH REACH 3

(E) PIPES
PROTECT PIPES DURING CONSTUCTION

GRADING LIMITS, TYP.

EDGE OF VINEYARD RD

CONSTRUCTION FENCING.

NO GRADING FROM STA 21+00 TO STA 22+30

MATCH REACH 3

MATCH REACH 2

© 2020 Microsoft Corporation © 2020 Maxar ©CNES (2020) Distribution Airbus DS

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A

NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

SITE PREPARATION PLAN - REACH 3
STA 19+00 TO 31+00

BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/10/2021
Sheet: 5 OF 15

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY
LAST SAVED: 8/12/2021 PLOT DATE: 9/2/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB
\\AE\JAN\S\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP A – SITE PREP.DWG



LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF GRADING
- LIMIT OF WORK
- ESA FENCING
- WILLOW BAFFLE
- COCONUT FIBER ROLL & WILLOW POLE PLANTING

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 9/3/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB
\\AELIANUS\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP A – GRADING.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING PLAN - REACH 1
STA 0+00 TO 11+50
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 6 OF 15

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF GRADING
- LIMIT OF WORK
- ESA FENCING
- WILLOW BAFFLE
- COCONUT FIBER ROLL & WILLOW POLE PLANTING

WILLOW STAKE. SEE DETAIL F

SINGLE TOE ROOTWAD. SEE GRADING DETAIL D

MATCH REACH 3

MATCH REACH 2

SINGLE TOE ROOTWAD. SEE GRADING DETAIL D

PROPOSED 20' WIDE VINEYARD ROAD

SINGLE TOE ROOTWAD. SEE GRADING DETAIL D

SINGLE TOE ROOTWAD. SEE GRADING DETAIL D. (PLACE BETWEEN EXISTING TREES)

Sta 14+00 - 16+00
72@3 - T291
3 Bay
4 Box Elder
17 CL Oak
1 Cottonwood
8 Valley Oak
11 Walnut
75 Eucalyptus

GROUP A: SITE 4

GROUP A: SITE 3

MATCH REACH 2

MATCH REACH 1

EDGE OF VINEYARD

N

0 40 80 160

SCALE (FEET)

PLOT DATE: 9/3/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

LAST SAVED: 8/12/2021 PLOT DATE: 9/3/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY

\\MELIANG\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP A - GRADING.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING PLAN - REACH 2
STA 11+50 TO 19+00
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size: D | Project: 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 7 OF 15

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF GRADING
- LIMIT OF WORK
- ESA FENCING
- WILLOW BAFFLE
- COCONUT FIBER ROLL & WILLOW POLE PLANTING

GROUP B: SITE 6

GROUP A: SITE 5

SINGLE TOE ROOTWAD. SEE GRADING DETAIL D

POINT BAR APEX JAM. SEE GRADING DETAIL C

PROPOSED 20' WIDE VINEYARD ROAD

SINGLE TOE ROOTWAD. SEE GRADING DETAIL D

(E) PIPES

WILLOW STAKE. SEE DETAIL F

WILLOW STAKE. SEE DETAIL F

SINGLE TOE ROOTWAD. SEE GRADING DETAIL D

NO GRADING FROM STA 21+00 TO STA 22+30

PROPOSED 20' WIDE VINEYARD ROAD

SINGLE TOE ROOTWAD. SEE GRADING DETAIL D

MATCH REACH 4

MATCH REACH 3

MATCH REACH 3

MATCH REACH 2

0 40 80 160

SCALE (FEET)

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 9/3/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\AELIANUS\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP A – GRADING.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT

GROUP A

NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

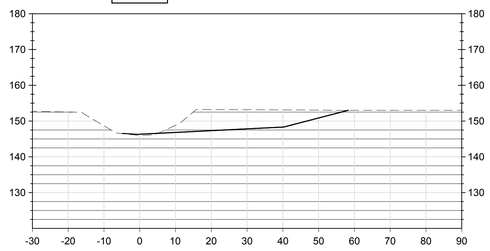
Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING PLAN - REACH 3
STA 19+00 TO 31+00

BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

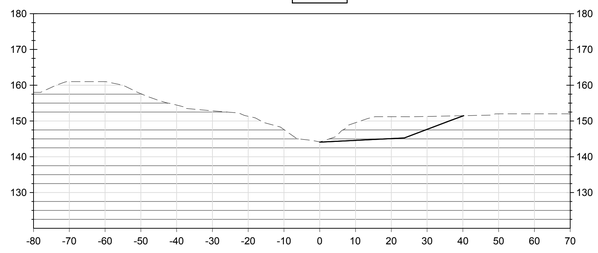
Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 8 OF 15

26+40.00



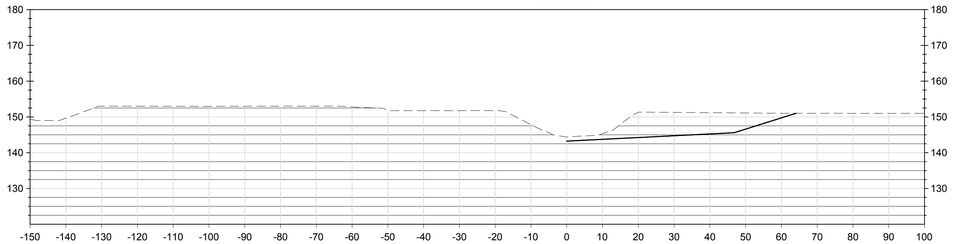
H SECTION AT STA 26+40
SCALE: 1" = 20'

19+70.00



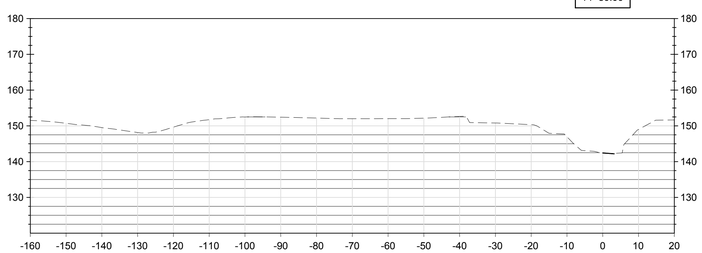
G SECTION AT STA 19+70
SCALE: 1" = 20'

17+20.00



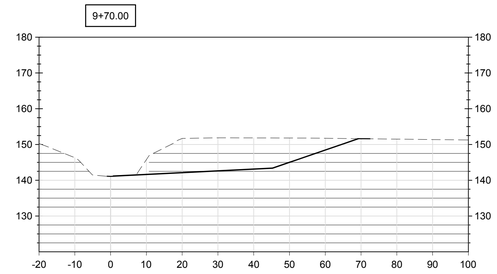
F SECTION AT STA 17+20
SCALE: 1" = 20'

14+80.00



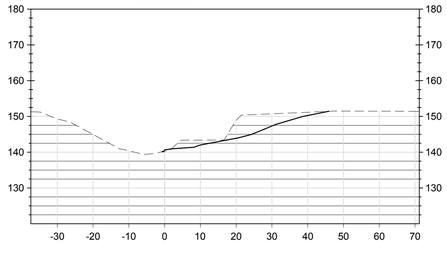
E SECTION AT STA 14+80
SCALE: 1" = 20'

9+70.00



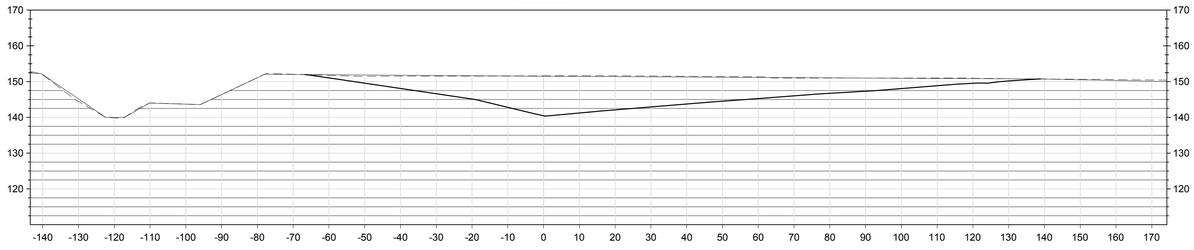
D SECTION AT STA 9+70
SCALE: 1" = 20'

7+05.21



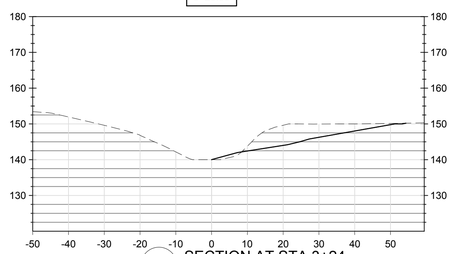
C SECTION AT STA 7+05
SCALE: 1" = 20'

5+33.43



B SECTION AT STA 5+33
SCALE: 1" = 20'

3+23.85



A SECTION AT STA 3+24
SCALE: 1" = 20'

\\ALAMEDA\S-PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP A - GRADING.DWG LAST SAVED: 8/12/2021 PLOT DATE: 9/3/2020 PLOT STYLE: CALTEST4-GRAYSCALE - 255.CTB

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

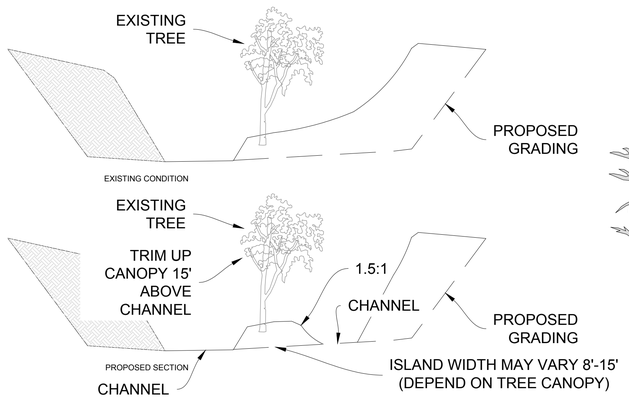
Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

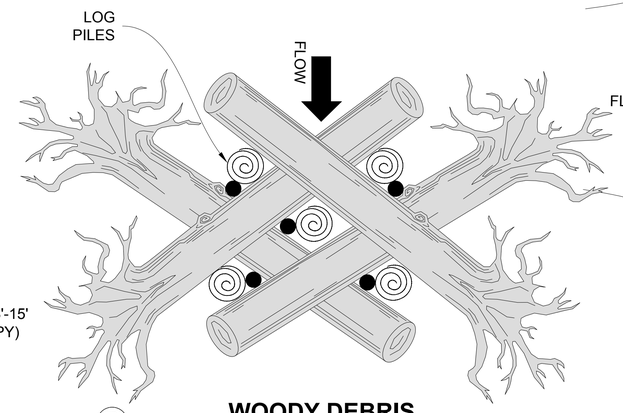
GRADING SECTIONS

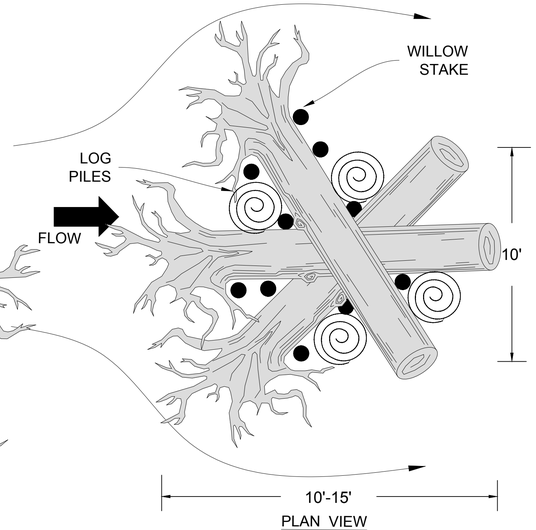
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 20'
Date: 8/11/21
Sheet: 9 OF 15

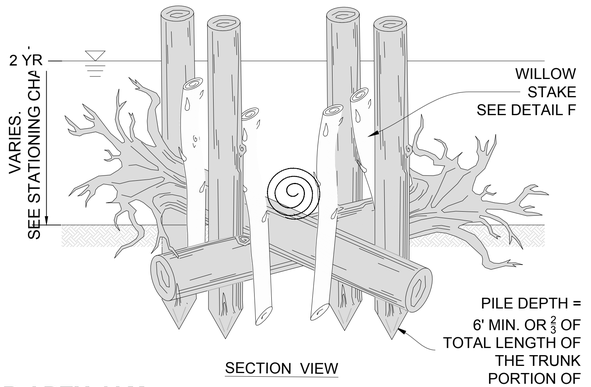


A NEAR INVERT TREE GRADING
SCALE: N.T.S.

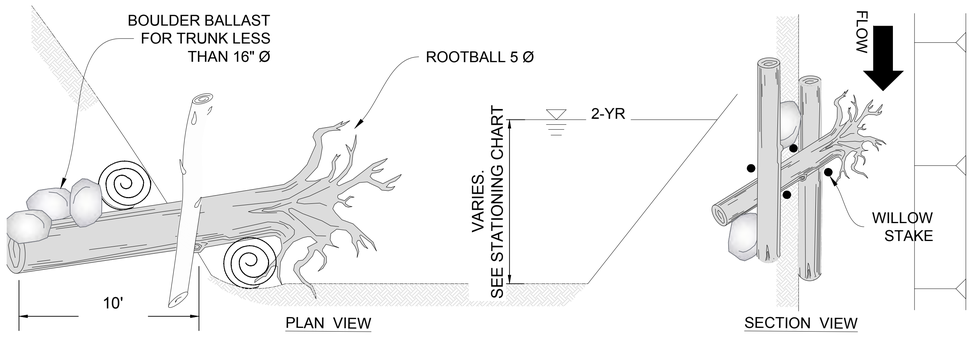




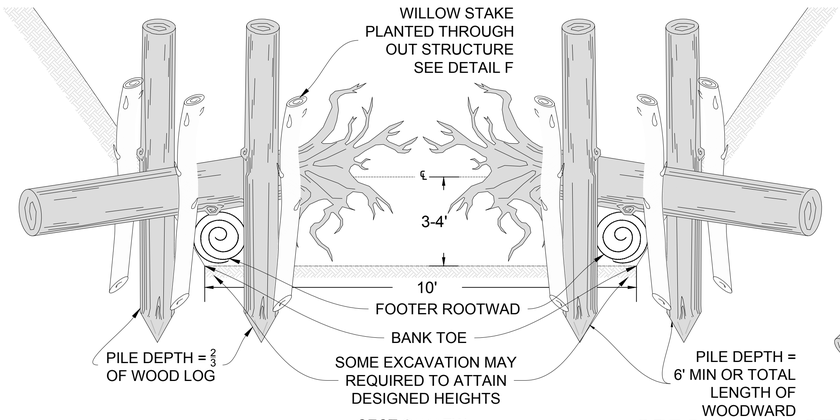
B WOODY DEBRIS
SCALE: N.T.S.



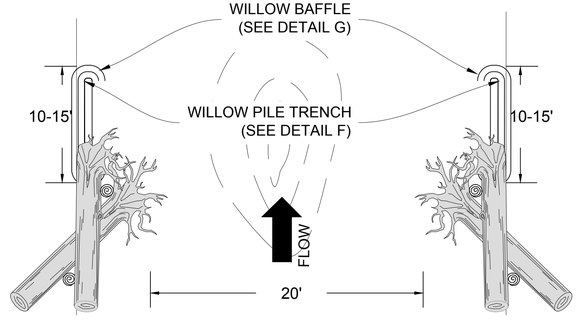
C POINT BAR APEX JAM
SCALE: N.T.S.



D SINGLE TOE ROOTWAD
SCALE: N.T.S.



E OPPOSING ROOTWADS
SCALE: N.T.S.



IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\ALAMEDA\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP A – GRADING DETAILS.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

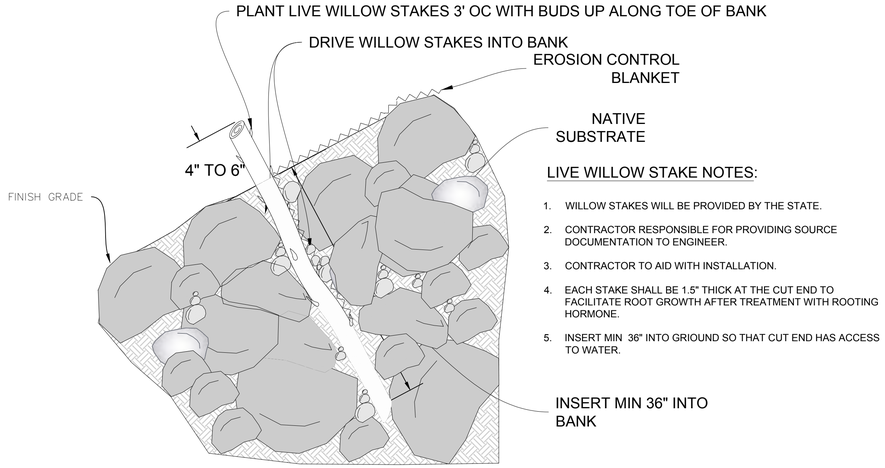
Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING DETAILS

BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 10 OF 15

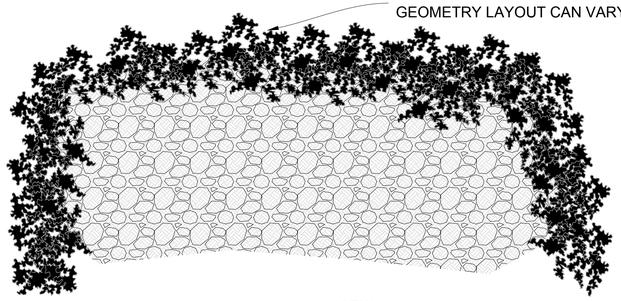


LIVE WILLOW STAKE NOTES:

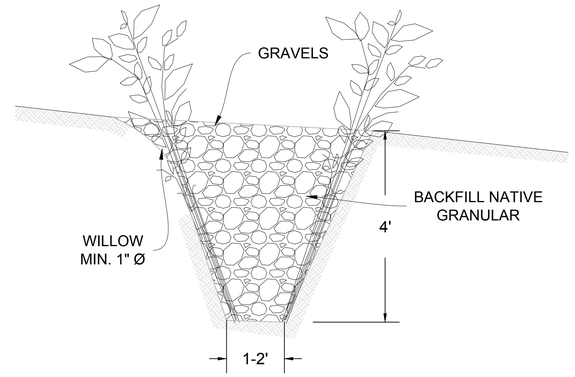
1. WILLOW STAKES WILL BE PROVIDED BY THE STATE.
2. CONTRACTOR RESPONSIBLE FOR PROVIDING SOURCE DOCUMENTATION TO ENGINEER.
3. CONTRACTOR TO AID WITH INSTALLATION.
4. EACH STAKE SHALL BE 1.5" THICK AT THE CUT END TO FACILITATE ROOT GROWTH AFTER TREATMENT WITH ROOTING HORMONE.
5. INSERT MIN 36" INTO GRIOUND SO THAT CUT END HAS ACCESS TO WATER.

F WILLOW STAKING IN ROCK RIP RAP

SCALE: N.T.S.



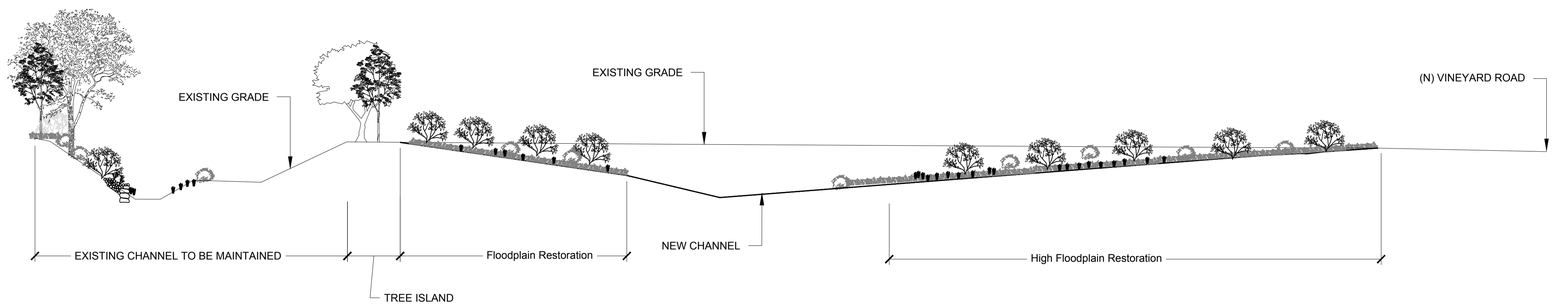
PLAN VIEW



SECTION VIEW

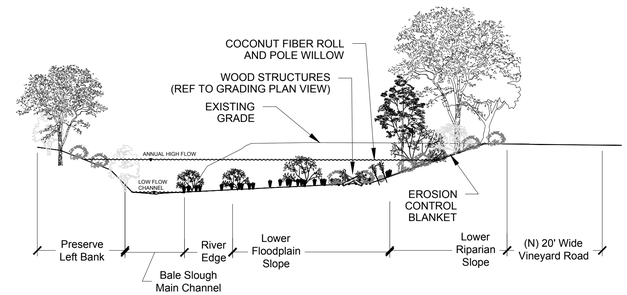
G WILLOW BAFFLE/TRENCH

SCALE: N.T.S.



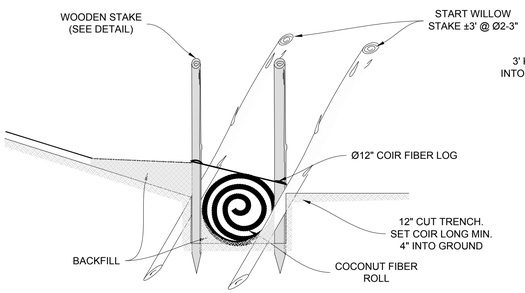
H CONCEPTUAL CROSS-SECTION AT STA 4+37

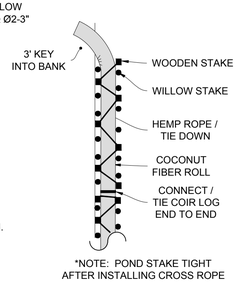
SCALE: N.T.S.



I CONCEPTUAL CROSS-SECTION AT STA 9+50

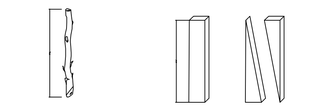
SCALE: N.T.S.





J COCONUT FIBER ROLL AND WILLOW STAKE POLE

SCALE: N.T.S.



1-1/2" - 2" THICK LIVE WILLOW STAKE AXE-SCORED AT THE BOTTOM TO FACILITATE ROOT GROWTH AFTER TREATMENT WITH ROOTING HORMONE; WILLOW STAKES SHALL BE SOAKED IN WATER FOR MIN. OF 24 HOURS PRIOR TO INSTALLATION.

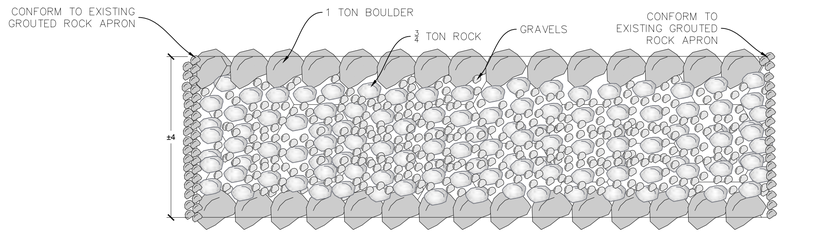
LIVE STAKE

SAW 2" x 4" TIMBER DIAGONALLY TO PRODUCE 2 DEAD STOUT STAKES

DEAD STAKE

K STAKES

SCALE: N.T.S.



L GRADE CONTROL

SCALE: N.T.S.

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING DETAILS

BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 11 OF 15

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY
PLOT STYLE: QUESTA-GRAYSCALE-255.CTB
PLOT DATE: 8/12/2021
LAST SAVED: 8/12/2021
\\AEUANUS\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP A – GRADING DETAILS.DWG

MATCH REACH 2

MATCH REACH 1

GROUP A: SITE 3

GROUP A: SITE 2

GROUP A: SITE 1

0 40 80 160

SCALE (FEET)

N

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY

BALE SLOUGH CENTERLINE

DIRT ROAD

ROCK TOE

SECONDARY HIGH FLOW CHANNEL

OAK ISLAND

VINEYARD DRIVEWAY

RUTHERFORD ROAD

PROPOSED 20' WIDE VINEYARD ROAD (NO PLANTING)

11+00

10+00

9+00

8+00

7+00

6+00

5+00

4+00

3+00

2+00

EDGE OF VINEYARD

LEGEND:

- 153 EXISTING CONTOUR
- 153 FINISH MINOR CONTOUR
- 150 FINISH MAJOR CONTOUR
- LIMIT OF WORK
- ESA FENCING

- REVEGETATION ZONE A: RIVER WET EDGE (0'-2' ABOVE CHANNEL THALWEG)
- REVEGETATION ZONE B: LOWER FLOODPLAIN SLOPE (2'-6' ABOVE CHANNEL THALWEG)
- REVEGETATION ZONE C: LOWER RIPARIAN SLOPE (6' - 10' ABOVE CHANNEL THALWEG)
- REVEGETATION ZONE D: UPPER RIPARIAN SLOPE (10'+ ABOVE CHANNEL THALWEG)

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\AEUANUS\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP A - PLANTING.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT

GROUP A

NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT

RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP

Civil
Environmental
& Water Resources

(510) 236-6114
FAX (510) 236-2423
questa@questaec.com

P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP

Drawn: OR

Checked: ST

Appr'd: ST

PLANTING PLAN - REACH 1

STA 0+00 TO 11+50

BALE SLOUGH- BEAR CREEK

RUTHERFORD, NAPA COUNTY

Size D | Project 1900133

Scale: 1" = 40'

Date: 8/10/2021

Sheet: 12 OF 15

LEGEND:

- 153 EXISTING CONTOUR
- 153 FINISH MINOR CONTOUR
- 150 FINISH MAJOR CONTOUR
- LIMIT OF WORK
- ESA FENCING

- REVEGETATION ZONE A: RIVER WET EDGE (0'-2' ABOVE CHANNEL THALWEG
- REVEGETATION ZONE B: LOWER FLOODPLAIN SLOPE (2'-6' ABOVE CHANNEL THALWEG
- REVEGETATION ZONE C: LOWER RIPARIAN SLOPE (6' - 10' ABOVE CHANNEL THALW
- REVEGETATION ZONE D: UPPER RIPARIAN SLOPE (10'+ ABOVE CHANNEL THALWEG

NE A:
EL THALWEG)
NE B:
N SLOPE
EL THALWEG)
NE C:
_OPE
NNEL THALWEG)
NE D:
_OPE
EL THALWEG)

MATCH REACH 3
MATCH REACH 2

20+00
19+00
18+00
17+00
16+00
15+00
14+00
13+00
12+00
11+00

Stp 14+00 - 16+00
72#3 - 1291
3 Bay
4 Box Elder
17 CL Oak
1 Cottonwood
8 Valley Oak
1 Walnut
75 Eucalyptus

PROPOSED 20' WIDE VINEYARD ROAD (NO PLANTING)

BALE SLOUGH CENTERLINE

EDGE OF VINEYARD

GROUP A: SITE 4

GROUP A: SITE 3

MATCH REACH 2
MATCH REACH 1

N

0 40 80 160
SCALE (FEET)

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

PLANTING PLAN - REACH 2
STA 11+50 TO 19+00
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/10/2021
Sheet: 13 OF 15

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY
LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB
\\AEJIAN\S\PROJECT\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP A – PLANTING.DWG

LEGEND:

- 153 EXISTING CONTOUR
- 153 FINISH MINOR CONTOUR
- 150 FINISH MAJOR CONTOUR
- LIMIT OF WORK
- ESA ESA ESA ESA FENCING

- REVEGETATION ZONE A: RIVER WET EDGE (0'-2' ABOVE CHANNEL THALWE
- REVEGETATION ZONE B: LOWER FLOODPLAIN SLOPE (2'-6' ABOVE CHANNEL THALWE
- REVEGETATION ZONE C: LOWER RIPARIAN SLOPE (6' - 10' ABOVE CHANNEL THALV
- REVEGETATION ZONE D: UPPER RIPARIAN SLOPE (10'+ ABOVE CHANNEL THALWE

B: SITE 6

GROUP A: SITE 5

31+00 30+00 29+00 28+00 27+00 26+00 25+00 24+00 23+00 22+00 21+00 20+00 19+00 18+00

BALE SLOUGH CENTERLINE

(E) PIPES

EDGE OF VINEYARD

PROPOSED 20' WIDE VINEYARD ROAD (NO PLANTING)

PROPOSED 20' WIDE VINEYARD ROAD (NO PLANTING)

MATCH REACH 4

MATCH REACH 3

MATCH REACH 3

MATCH REACH 2

N

0 40 80 160

SCALE (FEET)

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\MEL4AN\S\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP A – PLANTING.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

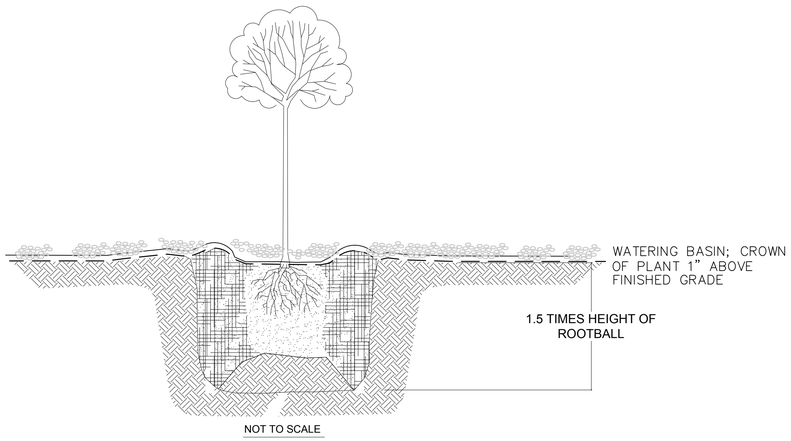
QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

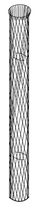
PLANTING PLAN - REACH 3
STA 19+00 TO 31+00
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/10/2021
Sheet: 14 OF 15



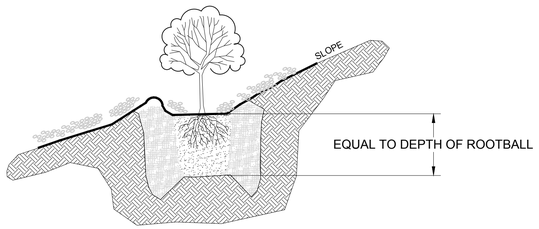
A TREE PLANTING

SCALE: N.T.S.



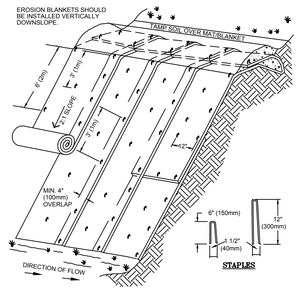
B RIGID SEEDLING PROTECTOR

SCALE: N.T.S.



C SHRUB PLANTING

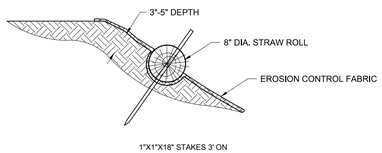
SCALE: N.T.S.



NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

D EROSION CONTROL FABRIC

SCALE: N.T.S.

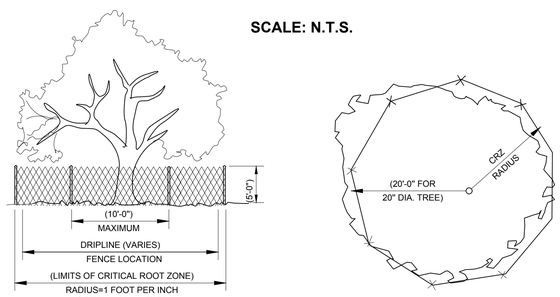


NOTE:

1. PLACE THE LOOSE EDGE OF THE STRAW WATTLES INTO A 4-INCH DEEP TRENCH AND SECURE WITH A SINGLE ROW OF STAPLES INSTALLED ON 12-INCH CENTERS. THEN PROCEED TO POSITION THE STRAW WATTLES INTO THE TRENCH ADJACENT TO THE SIDEWALK/BACK OF CURB/BACK OF V-DITCH.
2. DRIVE WOODEN 18-INCH STAKES THROUGH THE WATTLE ON APPROXIMATELY 3-FOOT CENTERS TO SECURE IN PLACE. CONSTRUCTION OF THE TRENCH AND PROPER STAPLE PLACEMENT IS NECESSARY TO PREVENT WATER AND SEDIMENT FROM FLOWING DIRECTLY UNDER THE SEDIMENT CONTROL WATTLE. WITH THIS TYPE OF INSTALLATION, WATER WILL ACCUMULATE BEHIND THE WATTLE, ALLOWING SEDIMENT LADEN WATER TO BE FILTERED THROUGH THE ROLL WHILE DEPOSITION OF SEDIMENT OCCURS BEHIND THE WATTLE.

E STRAW ROLL

SCALE: N.T.S.



F TREE PROTECTION FENCE

SCALE: N.T.S.

PLANTING LIST

Bale Slough Bear Creek Restoration Project - Planting Palette

RIPARIAN REVEGETATION CONTAINER PLANTINGS:

Container / Pole / Plug Plantings Acreage Total

Habitat Type: River Wet Edge (0'- 2' above channel thalweg)

	Biological Name / Common Name	Container	Quantity / ac	Spacing
Herbaceous	*Carex barbarae* / Santa Barbara Sedge	Super Stubby (L6)	2000	± 3' O.C.
	Carex praegracilis / California Field Sedge	Super Stubby (L6)	1000	
	Eleocharis macrostachya / Common Spike Rush	Super Stubby (L6)	500	
	Juncus balticus /Baltic Rush	Plug	1000	
	Juncus effusus var. brunneus / Common Rush	Super Stubby (L6)	500	

Habitat Type: Lower Floodplain Slope (2' - 6' above channel thalweg)

	Biological Name / Common Name	Container	Quantity / ac	Spacing
Trees	*Alnus rhombifolia* / White Alder	Treepot 4	65	± 10.5' O.C.
	Fraxinus latifolia / Oregon Ash	Treepot 4	30	
	Populus fremontii / Fremont's Cottonwood	Pole	20	
	Populus fremontii / Fremont's Cottonwood	Treepot 4	30	
	Salix laevigata / Red Willow	Pole	90	
	Salix lutea / Yellow Willow	Pole	40	
Shrubs	*Baccharis salicifolia* / Mule Fat	Deepot 40	20	± 20.0' O.C.
	Physocarpus capitatus/ Ninebark	1-Gallon	15	
	Rosa californica / California Wild Rose	1-Gallon	20	
	Symphoricarpos albus / Snowberry	1-Gallon	20	
Herbaceous	*Carex barbarae* / Santa Barbara Sedge	Super Stubby (L6)	1550	± 3' O.C.
	Carex praegracilis / California Field Sedge	Super Stubby (L6)	525	
	Eleocharis macrostachya / Common Spike Rush	Super Stubby (L6)	625	
	Elymus triticoides /Creeping Wildrye	Plug	1250	
	Euthamia occidentalis / Western Goldenrod	Liner	300	
	Juncus balticus /Baltic Rush	Plug	525	
	Juncus effusus var. brunneus / Pacific Rush	Super Stubby (L6)	525	
		Trees and Shrubs		
				Total

Habitat Type: Lower Riparian Slope (6' - 10' above channel thalweg)

	Biological Name / Common Name	Container	Quantity / ac	Spacing
Trees	*Alnus rhombifolia* / White Alder	Treepot 4	25	± 10' O.C.
	Fraxinus latifolia / Oregon Ash	Treepot 4	20	
	Populus fremontii / Fremont's Cottonwood	Pole	60	
	Populus fremontii / Fremont's Cottonwood	Treepot 4	30	
	Salix laevigata / Red Willow	Pole	80	
	Quercus agrifolia / Coast Live Oak	Treepot 4	15	
	Quercus lobata / Valley Oak	Treepot 4	20	
Shrubs	*Baccharis pilularis* / Coyote Bush	Deepot 40	30	± 15.5' O.C.
	Calycanthus occidentalis / Western Spice Bush	1-Gallon	20	
	Rosa californica / California Wild Rose	1-Gallon	20	
	Symphoricarpos albus / Snowberry	1-Gallon	60	
Herbaceous	*Carex barbarae* / Santa Barbara Sedge	Super Stubby (L6)	2000	± 3' O.C.
	Elymus triticoides /Creeping Wildrye	Plug	1500	
	Euthamia occidentalis / Western Goldenrod	Liner	500	
	Juncus balticus /Baltic Rush	Plug	500	
	Symphyotrichum chilense / Common Aster	Plug	500	
		Trees and Shrubs		
				Total

Habitat Type: Upper Riparian Slope (10' + above channel thalweg)

	Biological Name / Common Name	Container	Quantity / ac	Spacing
Trees	*Acer macrophyllum* / Big Leaf Maple	Treepot 4	20	± 13.5' O.C.
	Aesculus californica / California Buckeye	Treepot 4	20	
	Fraxinus latifolia / Oregon Ash	Treepot 4	15	
	Juglans californica / California Black Walnut	Treepot 4	30	
	Populus fremontii / Fremont's Cottonwood	Treepot 4	20	
	Salix laevigata / Red Willow	Pole	20	
	Quercus lobata / Valley Oak	Treepot 4	30	
	Quercus agrifolia / Coast Live Oak	Treepot 4	45	
	Umbellularia californica / Bay Laurel	Treepot 4	20	
Shrubs	*Achillea millefolium* / Yarrow	Deepot 40	35	± 13.0' O.C.
	Baccharis pilularis / Coyote Bush	Deepot 40	45	
	Calycanthus occidentalis / Western Spice Bush	1-Gallon	15	
	Heteromeles arbutifolia / Toyon	Treepot 4	15	
	Physocarpus capitatus/ Ninebark	1-Gallon	15	
	Ribes californicum/ California gooseberry	1-Gallon	15	
	Rosa californica / California Wild Rose	1-Gallon	55	
	Symphoricarpos albus / Snowberry	1-Gallon	50	
Vines	*Aristolochia californica*/ Pipe vine	1-Gallon	20	± 35.5' O.C.
	Lonicera hispidula / Honeysuckle	1-Gallon	15	
Herbaceous	*Bromus carinatus* / California Brome	Plug	325	± 3.5' O.C.
	Carex barbarae / Santa Barbara Sedge	Super Stubby (L6)	825	
	Elymus glaucus / Blue Wildrye	Plug	1050	
	Elymus triticoides /Creeping Wildrye	Plug	525	
	Festuca idahoensis / Idaho Fescue	Plug	525	
	Muhlenbergia rigens / Deergrass	1-Gallon	100	
	Symphyotrichum chilense / Common Aster	Plug	425	

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: ~~~~
IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY
\\ARUP\US\PROJECTS\250191\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\PLANTING DETAILS.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: ST
Drawn: KT/OR
Checked: ST
Appr'd: ST

PLANTING DETAILS

BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

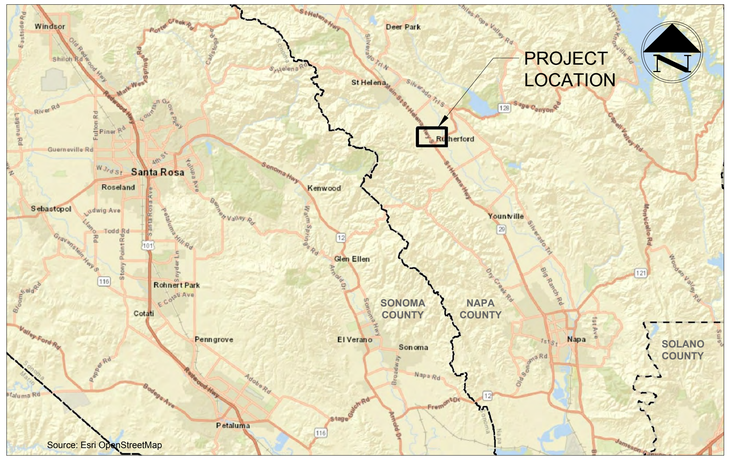
Size D | Project 1900133
Scale: NO SCALE
Date: 8/12/21
Sheet: 15 OF 15

BEAR CREEK RESTORATION PROJECT - GROUP B

NAPA COUNTY, CA

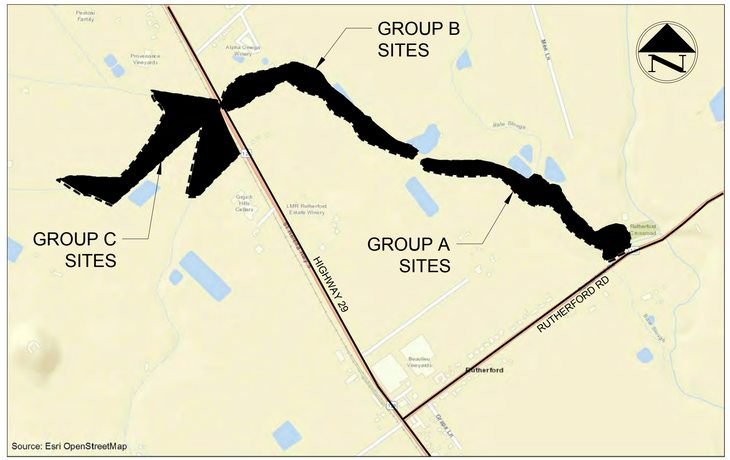
PROJECT NO. ----------

THE PROPERTIES OF GROUP B IS UNDER TITLE ISSUES. THIS DESIGN IS SUBJECT TO REVIEW AND APPROVAL OF THE CONCURRENT LAND OWNERS.



PROJECT LOCATION MAP

NO SCALE



PROJECT VICINITY MAP

NO SCALE

TABLE OF CONTENTS

1	TITLE SHEET
2	Group B – Overview
3	SITE PREPARATION PLAN – REACH 4
4	SITE PREPARATION PLAN – REACH 5
5	SITE PREPARATION PLAN – REACH 6
6	GRADING PLAN – REACH 4
7	GRADING PLAN – REACH 5
8	GRADING PLAN – REACH 6
9	GRADING SECTIONS
10	GRADING DETAILS
11	GRADING DETAILS
12	PLANTING PLAN – REACH 4
13	PLANTING PLAN – REACH 5
14	PLANTING PLAN – REACH 6
15	PLANTING DETAILS

GENERAL NOTES

1. DESIGN INTENT: THESE PLANS AND SPECIFICATIONS REPRESENT THE DESIGN INTENT OF QUESTA ENGINEERING CORPORATION (THE ENGINEER), AS APPROVED BY THE NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT DEPARTMENT. THE CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS SHOWN ON THESE PLANS AND SPECIFICATIONS AND SHALL BE RESPONSIBLE FOR ANY DEVIATIONS FROM THESE PLANS AND ASSOCIATED RISK AND EXPENSE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A COPY OF THE APPROVED PLANS AND SPECIFICATIONS AND ANY ADDENDA AT THE JOB SITE AT ALL TIMES. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY UNFORESEEN CIRCUMSTANCES OR CONDITIONS THAT WOULD ALTER THESE PLANS AND SPECIFICATIONS FOR APPROVAL OF MODIFICATIONS TO THE INTENDED DESIGN.

2. COMPOSITE GROUND MAP: THE PROPOSED IMPROVEMENTS SHOWN ON THESE DRAWINGS ARE SUPERIMPOSED ON A BASE MAP. THIS BASE MAP IS COMPILED FROM A SURVEY, AND OTHER DATA AS MADE AVAILABLE TO THE ENGINEER, WHO SHALL NOT BE HELD LIABLE FOR CHANGES, INACCURACIES, OMISSIONS OR OTHER ERRORS ON THESE DOCUMENTS. THE COMPOSITE BASE MAP IS PROVIDED AS AN AID ONLY AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THESE DOCUMENTS AND INCORPORATING/INTEGRATING ALL CONSTRUCTION AS REQUIRED TO ACCOMMODATE THE SAME.

3. MATERIALS AND WORKMANSHIP: ALL MATERIALS, WORKMANSHIP, AND CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ~~NAPA COUNTY PUBLIC WORKS DEPARTMENT ENGINEERING STANDARD PLANS AND SPECIFICATIONS~~, AND THE CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) 2010 STANDARD PLANS AND SPECIFICATIONS UNLESS OTHERWISE NOTED. ALL MATERIAL SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.

4. PRE-CONSTRUCTION MEETING: A PRE-CONSTRUCTION MEETING SHALL BE ARRANGED BY THE CONTRACTOR AT THE JOB SITE PRIOR TO THE COMMENCEMENT OF WORK. THE MEETING SHALL BE ATTENDED BY THE OWNER, CONTRACTOR (INCLUDING SITE FOREMAN AND KEY PERSONNEL), ENGINEER, AND REPRESENTATIVES OF ANY INVOLVED REGULATORY AGENCIES. PROSPECTIVE PARTICIPANTS SHALL BE NOTIFIED OF THE MEETING A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO THE MEETING. THE PURPOSE OF THE MEETING IS TO REVIEW THE WORK PLAN AND PROVIDE CLARIFICATIONS, REVIEW JOB REQUIREMENTS, AND DISCUSS CONDITIONS OF ANY PERMITS. SPECIAL ATTENTION WILL BE PAID TO ANY WETLANDS, SOIL EROSION AND WATER QUALITY PROTECTION REQUIREMENTS. NOTICE FOR THE CONTRACTOR TO PROCEED WITH WORK SHALL BE PROVIDED AT COMPLETION OF THE PRE-CONSTRUCTION MEETING.

5. RESOURCE PROTECTION: THE CONTRACTOR IS ADVISED OF THE PRESENCE OF SENSITIVE RESOURCES LOCATED NEAR PROJECT WORK AREAS. THE TRAIL ALIGNMENT, FENCING, STAGING AREAS AND ALL OTHER PROJECT FACILITIES HAVE BEEN CAREFULLY LOCATED TO AVOID PHYSICAL DISTURBANCE OF SENSITIVE RESOURCES. ALL CONTRACTOR ACTIVITIES, INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION ACTIVITIES, VEHICLE MAINTENANCE, AND MATERIALS AND EQUIPMENT STORAGE AND STAGING, MUST BE STRICTLY CONFINED TO THE WORK AREAS SHOWN ON THE DRAWINGS. THE LIMITS OF WORK WILL BE CAREFULLY LOCATED IN THE FIELD BY THE CONTRACTOR AND ENGINEER OF RECORD, AND ALL WORK LIMIT AREAS WILL BE PROTECTED BY STRAW WATTLES, CONSTRUCTION BARRIER FENCING, AND/OR ESA\SILT FENCING AS SHOWN ON THE DRAWINGS.

   CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PENALTIES AND ALL REPAIRS AND MITIGATIONS IMPOSED DUE TO BREACH OF PROTOCOL AND UNAUTHORIZED INTRUSION INTO SENSITIVE RESOURCE AREAS.

6. COMPLETION SCHEDULE: CONTRACTOR SHALL PROVIDE ENGINEER WITH A PROJECT CONSTRUCTION COMPLETION SCHEDULE WITHIN 10 WORKING DAYS OF AWARD OF CONTRACT AND REVIEW THIS SCHEDULE AND ANY CHANGES AT PRE-CONSTRUCTION MEETING. SITE IMPROVEMENTS, INCLUDING TRAIL CONSTRUCTION MUST BE COMPLETED PRIOR TO THE DATE SPECIFIED IN THE CONTRACT DOCUMENTS.

7. UTILITIES: CONTRACTOR SHALL NOTIFY ALL PUBLIC AND PRIVATE UTILITY COMPANIES IN THE PROJECT AREA A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR MUST INVESTIGATE AND VERIFY THE LOCATION OF ANY EXISTING UTILITIES WITHIN THE PROJECT AREA. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY, LOCATE, AND PROTECT ALL UTILITIES. ANY UTILITIES PLOTTED ON THE PLANS ARE CONSIDERED TENTATIVE AND APPROXIMATIONS AND THEREFORE, NO WARRANTY EXPRESSED OR IMPLIED IS MADE AS TO THE COMPLETENESS OR CORRECTION OF THEIR LOCATION. THE UTILITY COMPANIES ARE THOUGHT TO BE MEMBERS OF THE UNDERGROUND SERVICE ALERT (U.S.A.) ON-CALL PROGRAM. THE CONTRACTOR SHALL NOTIFY U.S.A. 72-HOURS IN ADVANCE OF PERFORMING EXCAVATION WORK AT 1-800-227 2600, 7:00 AM TO 5:00 PM, MONDAY THROUGH FRIDAY. EXISTING PUBLIC UTILITIES SHALL BE KEPT IN SERVICE AT ALL TIMES. UTILITIES THAT INTERFERE WITH THE WORK TO BE PERFORMED SHALL BE PROTECTED AS REQUIRED BY THE COUNTY, PG&E, AT&T, AND ALL OTHER AFFECTED AGENCIES.

8. DAMAGE AND PROTECTION OF EXISTING FACILITIES: CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING FACILITIES, AND ANY OTHER IMPROVEMENTS FROM DAMAGE RESULTING FROM CONTRACTOR'S WORK, INCLUDING ALL UTILITIES, PUBLIC AND PRIVATE. CONTRACTOR SHALL EXERCISE CARE TO AVOID EXCESSIVE DAMAGE TO EXISTING PUBLIC PROPERTY, INCLUDING STREETS, PARKING AREAS, NATIVE TREES, SHRUBS, WETLANDS, AND OTHER PROPERTY IMPROVEMENTS. IF CONTRACTOR CAUSES DAMAGES TO SUCH ITEMS, THEY SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT IN LIKE NUMBER, KIND, CONDITION AND SIZE. THE COST OF REPAIRS AND REPLACEMENT OF DAMAGED PROPERTY SHALL BE AT THE CONTRACTOR'S EXPENSE. ANY SUCH COSTS MAY BE DEDUCTED BY THE CLIENT FROM MONIES DUE CONTRACTOR UNDER THIS CONTRACT.

9. JOB SITE CONDITIONS, TRAFFIC CONTROL AND CONTRACTOR RESPONSIBILITY: CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY, TRAFFIC CONTROL, AND ACCESS TO AND FROM ADJOINING DRIVEWAYS AND STREETS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD COUNTY AND THE ENGINEER (QUESTA ENGINEERING CORPORATION) HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPT FROM LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE CLIENT OR THE ENGINEER. CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING CONSTRUCTION, INCLUDING SAFETY OF PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

   ALL WORK SHALL BE IN COMPLIANCE WITH APPLICABLE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARDS AS SET FORTH BY THE FEDERAL DEPARTMENT OF LABOR AND/OR THE STATE OF CALIFORNIA. THE CONTRACTOR SHALL SECURE A TRENCH PERMIT FROM THE CALIFORNIA DIVISION OF INDUSTRIAL SAFETY (CalOSHA) PRIOR TO EXCAVATION OF ANY TRENCH GREATER THAN FIVE (5) FEET IN DEPTH.

   ALL TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CALTRANS MANUAL OF TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OF WORK ZONES. ALL SIGNS SHALL BE APPROPRIATELY CONSTRUCTED WITH REFLECTIVE MATERIAL ON A BACKING OF METAL OR FABRIC (NO WOOD OR PLASTIC ALLOWED) AND SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION TO PROVIDE PROPER VISIBILITY, PER SECTION 12 OF THE CALTRANS SPECIAL PROVISIONS.

   THE CONTRACTOR SHALL MAINTAIN REASONABLE ACCESS TO ALL DRIVEWAYS DURING CONSTRUCTION.

10. CLARIFICATION, CHANGE ORDERS, AND ADDITIONAL WORK: SHOULD ANY CONTRACTOR OR SUBCONTRACTOR FIND ANY DEFICIENCIES, ERRORS, CONFLICTS, OR OMISSIONS IN THESE PLANS AND SPECIFICATIONS, OR SHOULD THERE BE ANY DOUBT AS TO THEIR MEANING OR INTENT, THEN THE CONTRACTOR SHALL NOTIFY JOINTLY, CLIENT AND THE DESIGN ENGINEER (QUESTA ENGINEERING CORPORATION) FOR A WRITTEN CLARIFICATION, ADDENDUM, ETC. SHOULD THE CONTRACTOR FAIL TO DO SO BEFORE SUBMITTING AN INVOICE FOR ADDITIONAL WORK, THE CONTRACTOR CANNOT CLAIM ADDITIONAL COMPENSATION FOR WORK REQUIRED TO COMPLETE THE PROJECT. THE EXCEPTION IS EMERGENCY WORK AS DEFINED IN THE CALTRANS STANDARDS.

    THE CLIENT OR ENGINEER OF RECORD, ACTING ON BEHALF OF THE CLIENT, MAY REQUIRE PLAN REVISIONS DUE TO UNFORESEEN CIRCUMSTANCES AND CONFLICTS OCCURRING DURING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY, JOINTLY THE CLIENT AND THE ENGINEER OF RECORD OF ANY SUCH WORK THAT IS ADDITIONAL AND SUBMIT A WRITTEN COST-ESTIMATE FOR SUCH WORK. "EXTRA WORK" AND WRITTEN CHANGE ORDERS WILL BE EXECUTED UPON THE RECOMMENDATION OF THE ENGINEER.

11. PAYMENTS: PAYMENT SHALL BE BASED ON COMPLETED CONTRACTOR'S BID SHEET AND ISSUED WRITTEN CHANGE ORDERS. THE ENGINEER OF RECORD SHALL VERIFY FIELD MEASUREMENTS AND CONTRACTOR QUANTITY ESTIMATES, WHERE APPLICABLE, AND UNLESS OTHERWISE NOTED.

12. MISCELLANEOUS: WRITTEN DIMENSIONS ALWAYS TAKE PRECEDENCE OVER SCALED DIMENSIONS IF THERE IS A CONFLICT, THE CONTRACTOR SHALL CONTACT THE ENGINEER TO OBTAIN ADDITIONAL CLARIFICATION. NO DEVIATION OR SUBSTITUTION SHALL BE ALLOWED WITHOUT OBTAINING PRIOR WRITTEN APPROVAL FROM THE ENGINEER.

13. EROSION CONTROL: EROSION CONTROL SHALL BE IN ACCORDANCE WITH THESE DRAWINGS AND CONTRACTOR SHALL PREPARE A SWPPP FOR SUBMITTAL AND APPROVAL BY THE CLIENT. ALL DISTURBED AREAS SHALL BE COVERED WITH WEED-FREE STRAW TO PREVENT EROSION. SUBSEQUENTLY ALL DISTURBED AREAS SHALL BE SEEDED WITH NATIVE GRASS SEED.

14. EARTHWORK AND OFFHAUL: SUITABLE EXCAVATED MATERIAL CAN BE USED IN DESIGNATED FILL AREAS (i.e. BERMS, ISLANDS, BANK GRADING, VEGETATED MOUND AREAS. EXCESS MATERIAL SHALL BE DISPOSED OF OFF-SITE BY THE CONTRACTOR.

15. CONSTRUCTION STAGING: STAGING AREAS FOR CONSTRUCTION ACTIVITIES ARE SHOWN ON SHEET 3: SITE PROTECTION, DEMOLITION, AND STAGING. THE CONTRACTOR IS LIMITED TO THESE AREAS UNLESS OTHERWISE NOTIFIED IN WRITING BY THE CLIENT OR ENGINEER.

ABBREVIATIONS

"T	= TREE (APPROX. ø @ BREAST HEIGHT)	GP	= GATE POST
AP	= ANGLE POINT	GR	= GROUND ELEVATION
AB	= AGGREGATE BASE	MHW	= MEAN HIGH WATER
BO	= BOTTOM OF	MLW	= MEAN LOW WATER
BOL	= BOLLARD	<N>	= NEW
BP	= BEGINNING POINT	NOM	= NOMINAL
BRC	= BACK OF ROLL CURB	<P>	= PROPOSED
CONC	= CONCRETE	P	= PAVEMENT
CD	= CHECK DAM	PT	= PRESSURE TREATED
CY	= CUBIC YARDS	S.	= SIGN
DL	= DAYLIGHT	SIM	= SIMILAR
<E>	= EXISTING	SF	= SQUARE FEET
EG	= EXISTING GRADE	SWL	= SWALE
EL	= ELEVATION	T	= TOP OF SLOPE
EOP	= EDGE OF PAVEMENT	t	= TOE OF SLOPE
EP	= ENDING POINT	TB	= TOP OF BERM
ESA	= ENVIRONMENTALLY SENSITIVE AREA	TO	= TOP OF
F	= FENCE	TOC	= TOP OF CONCRETE
FG	= FINISHED GRADE	TW	= TOP OF WALL
FL	= FLOW LINE	WLK	= WALK
GB	= GRADE BREAK		
GL	= GUTTER LIP		

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

TITLE SHEET

BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 1 OF 15

\\AELIAS\PROJECT\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\TITLE AND PRJ OVERVIEW SHEETS.DWG LAST SAVED: 8/12/2021 PLOT DATE: 7/4/2021 PLOT STYLE: QUESTA-RAYSCALE-255.CTB
IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY



IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 4/30/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\MELIANUS\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP B - SITE PREP.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GROUP B OVERVIEW
--
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 2 OF 14



EXISTING CONTOUR
PARCEL LINE
LIMIT OF WORK
ESA FENCING
EXISTING TREE
SITE ACCESS
CONSTRUCTION ENTRANCE
STAGING AREA

TREES TO BE REMOVED = 36

TREE#	QTY.	SPECIES	DIAMETER
120	3	WILLOW	12
121	1	VALLEY OAK	16
122	1	WILLOW	10
123	6	WILLOW	14
124	6	WILLOW	20
125	4	WILLOW	24
126	2	WILLOW	16
127	4	WILLOW	20
128	4	WILLOW	18
129	5	WILLOW	20

N

0 40 80 160

SCALE (FEET)

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 4/30/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\KELIANUS\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP B – SITE PREP.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

SITE PREPARATION PLAN - REACH 4
STA 30+50 TO 41+00
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 3 OF 14



153 EXISTING CONTOUR
PARCEL LINE
LIMIT OF WORK
ESA FENCING
EXISTING TREE
SITE ACCESS
CONSTRUCTION ENTRANCE
STAGING AREA

TREES TO BE REMOVED = 11

TREE#	QTY.	SPECIES	DIAMETER
130	1	BOX ELDER	10
131	1	ALDER	10
132	2	ALDER	8
137	1	WILLOW	24
138	1	VALLEY OAK	6
139	2	WILLOW	24
140	3	WILLOW	24

N

0 40 80 160
SCALE (FEET)

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 4/30/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB
\\KELIANG\V\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP B – SITE PREP.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

SITE PREPARATION PLAN - REACH 5
STA 41+00 TO 51+50
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 4 OF 14

EXISTING CONTOUR
PARCEL LINE
LIMIT OF WORK
ESA FENCING
EXISTING TREE
SITE ACCESS
CONSTRUCTION ENTRANCE
STAGING AREA

TREES TO BE REMOVED = 15

TREE#	QTY.	SPECIES	DIAMETER
141	1	BOX ELDER	10
214	8	WILLOW	0
221	1	WILLOW	20
222	1	WILLOW	16
223	1	VALLEY OAK	42
224	1	ARUNDO WILLOW	0
225	1	ARUNDO WILLOW	0
226	1	ARUNDO WILLOW	0

*NO TREES SHALL BE REMOVED IN GROUP B. ALL TREES SHALL BE PROTECTEDAS NECESSARY

N

0 40 80 160

SCALE (FEET)



BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

SITE PREPARATION PLAN - REACH 6
STA 51+50 TO 59+00
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 5 OF 14

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY
PLOT STYLE: QUESTA-GRAYSCALE-255.CTB PLOT DATE: 4/30/2020 LAST SAVED: 8/12/2021
\\AEUANUS\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP B – SITE PREP.DWG

SINGLE TOE ROOTWAD.
SEE GRADING DETAIL D

MATCH REACH 5

MATCH REACH 4

OPPOSING ROOTWAD.
SEE GRADING DETAIL E

OPPOSING ROOTWAD.
SEE GRADING DETAIL E

PROPOSED 15' WIDE
VINEYARD ROAD

GROUP B: SITE 7

GROUP B: SITE 6

(E) VINEYARD ROAD

NEW BRIDGE

(E) VINEYARD ROAD

GROUP A
LIMIT OF WORK

MATCH REACH 4

MATCH REACH 3

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF GRADING
- LIMIT OF WORK
- ESA FENCING
- WILLOW BAFFLE
- COCONUT FIBER ROLL & WILLOW POLE PLANTING

N

0 40 80 160

SCALE (FEET)

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 3/24/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\AELIANUS\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP B - GRADING.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING PLAN - REACH 4
STA 30+50 TO 41+00
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/2021
Sheet: 6 OF 14

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF GRADING
- LIMIT OF WORK
- ESA FENCING
- WILLOW BAFFLE
- COCONUT FIBER ROLL & WILLOW POLE PLANTING

GROUP B: SITE 10

GROUP B: SITE 9

GROUP B: SITE 8

(E) VINEYARD PARKING / SOLAR ARRAY

(E) PIPE

BALE SLOUGH CENTERLINE

SINGLE TOE ROOTWAD. SEE GRADING DETAIL D

WOODY DEBRIS. SEE GRADING DETAIL B

POINT BAR APEX JAM

OPPOSING ROOTWAD. SEE GRADING DETAIL E

PROPOSED 15' WIDE VINEYARD ROAD

MATCH REACH 6

MATCH REACH 5

MATCH REACH 5

MATCH REACH 4

0 40 80 160

SCALE (FEET)

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT

GROUP B

NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING PLAN - REACH 5

STA 41+00 TO 51+50

BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/2021
Sheet: 7 OF 14

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY
LAST SAVED: 8/12/2021 PLOT DATE: 3/24/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB
\\KELIANUS\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP B - GRADING.DWG

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF GRADING
- LIMIT OF WORK
- ESA FENCING
- WILLOW BAFFLE
- COCONUT FIBER ROLL & WILLOW POLE PLANTING

GROUP B: SITE 11

(E) VINEYARD PARKING / SOLAR ARRAY

BALE SLOUGH CENTERLINE

SINGLE TOE ROOTWAD. SEE GRADING DETAIL D

(E) PIPE

OPPOSING ROOTWAD. SEE GRADING DETAIL E

POINT BAR APEX JAM

MATCH REACH 6

MATCH REACH 5

GROUP B: SITE 13

HIGHWAY 29

GROUP C LIMIT OF WORK

0 40 80 160

SCALE (FEET)

\\AEUANUS\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP B - GRADING.DWG LAST SAVED: 8/12/2021 PLOT DATE: 3/24/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com

Sht:	Rev:	Date:	By:	Description:	App'd

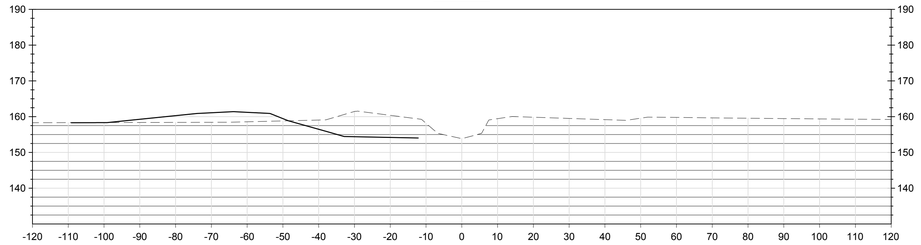
Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING PLAN - REACH 6
STA 51+50 TO 59+00

BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

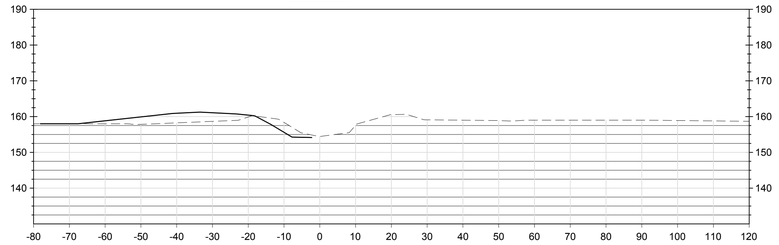
Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/2021
Sheet: 8 OF 14

56+70.00



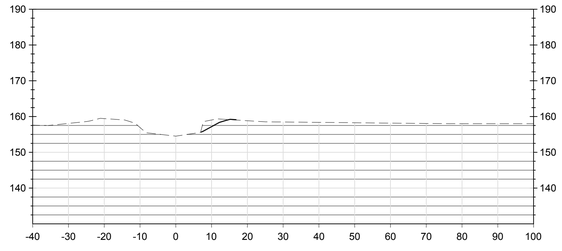
P SECTION AT STA 56+70
SCALE: 1" = 20'

54+70.00



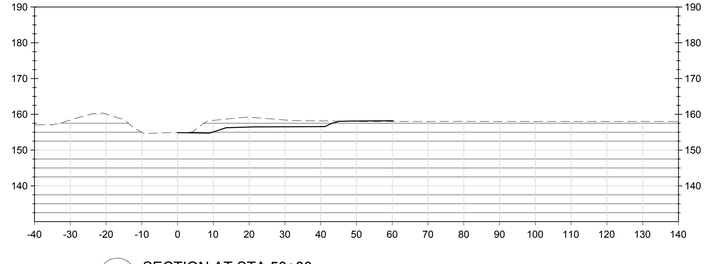
O SECTION AT STA 54+70
SCALE: 1" = 20'

52+70.00



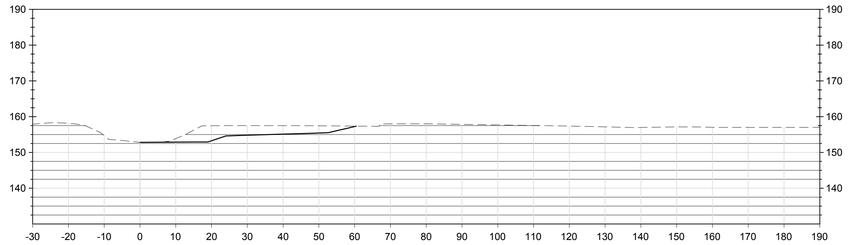
N SECTION AT STA 52+70
SCALE: 1" = 20'

50+80.00



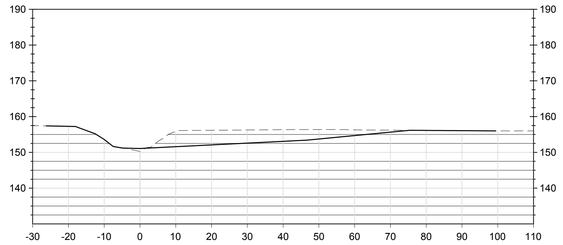
M SECTION AT STA 50+80
SCALE: 1" = 20'

46+70.00



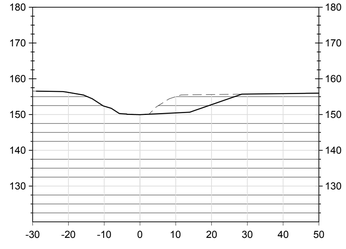
L SECTION AT STA 46+70
SCALE: 1" = 20'

42+70.00



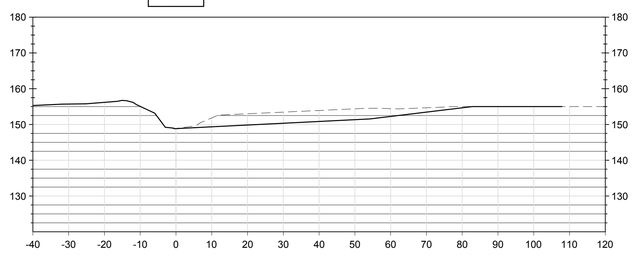
K SECTION AT STA 42+70
SCALE: 1" = 20'

40+20.00



J SECTION AT STA 40+20
SCALE: 1" = 20'

37+70.00



I SECTION AT STA 37+70
SCALE: 1" = 20'

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

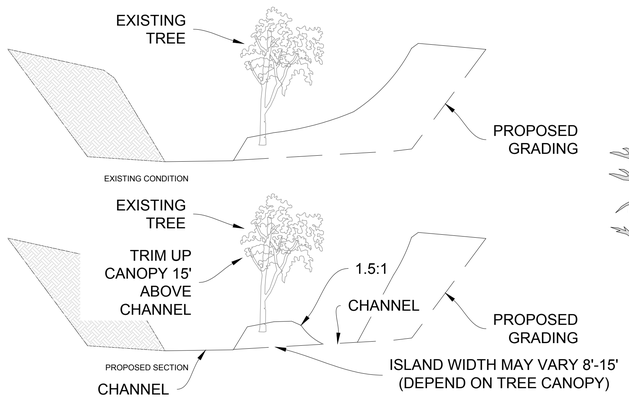
Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING SECTIONS

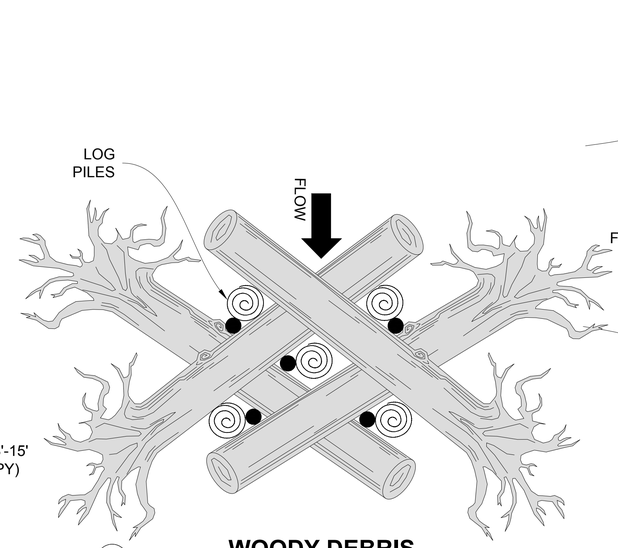
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

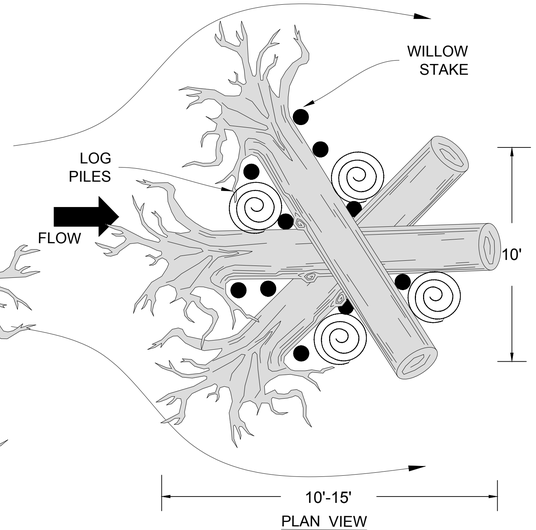
Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/2021
Sheet: 9 OF 14

\\QUESTA\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP B - GRADING.DWG
LAST SAVED: 8/12/2021 PLOT DATE: 3/24/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB
IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY

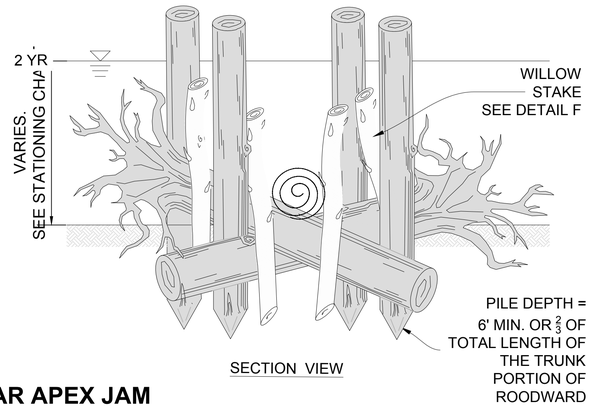


A NEAR INVERT TREE GRADING
SCALE: N.T.S.

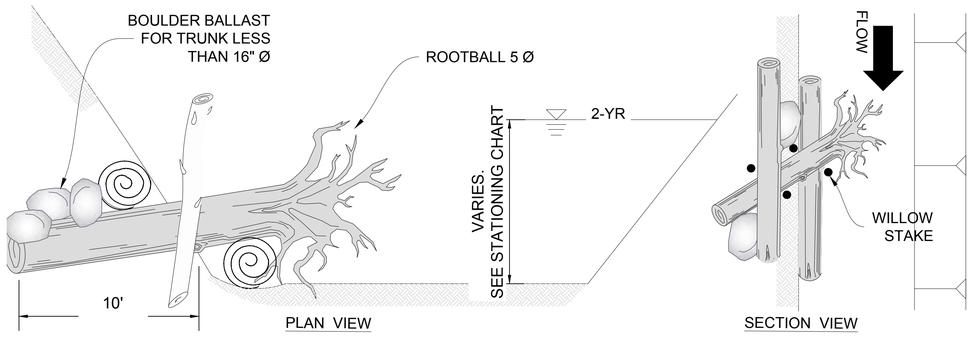




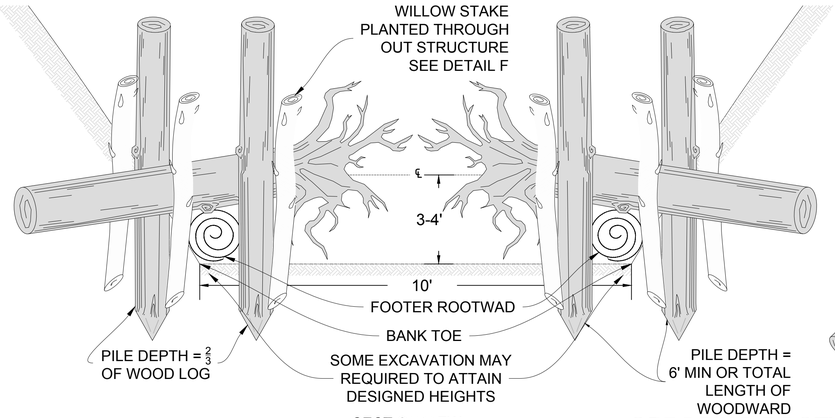
B WOODY DEBRIS
SCALE: N.T.S.



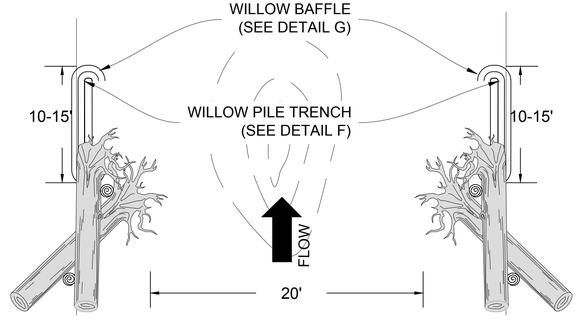
C POINT BAR APEX JAM
SCALE: N.T.S.



D SINGLE TOE ROOTWAD
SCALE: N.T.S.



E OPPOSING ROOTWADS
SCALE: N.T.S.



IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\ALAMEDA\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP B – GRADING DETAILS.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

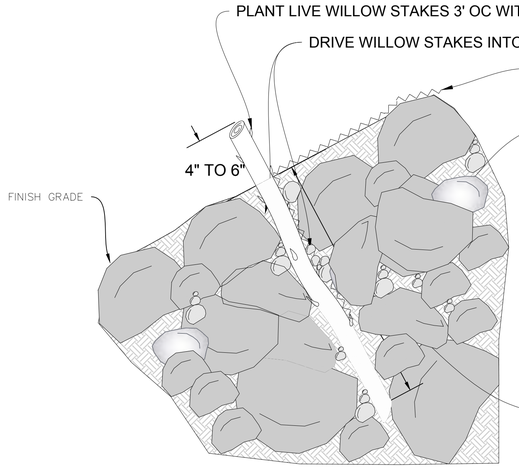
Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING DETAILS

BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 10 OF 15

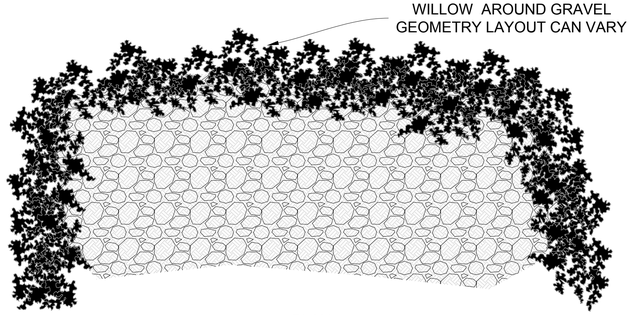


LIVE WILLOW STAKE NOTES:

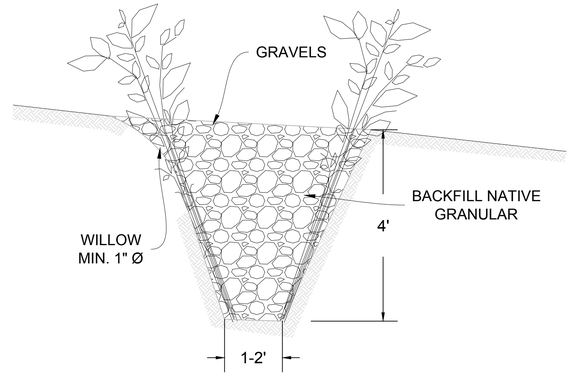
1. WILLOW STAKES WILL BE PROVIDED BY THE STATE.
2. CONTRACTOR RESPONSIBLE FOR PROVIDING SOURCE DOCUMENTATION TO ENGINEER.
3. CONTRACTOR TO AID WITH INSTALLATION.
4. EACH STAKE SHALL BE 1.5" THICK AT THE CUT END TO FACILITATE ROOT GROWTH AFTER TREATMENT WITH ROOTING HORMONE.
5. INSERT MIN 36" INTO GRIOUND SO THAT CUT END HAS ACCESS TO WATER.

F WILLOW STAKING IN ROCK RIP RAP

SCALE: N.T.S.



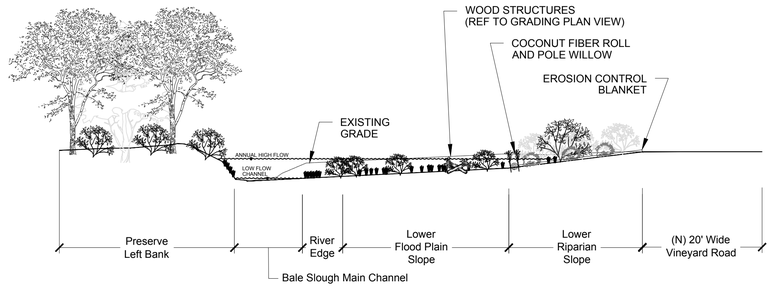
PLAN VIEW



SECTION VIEW

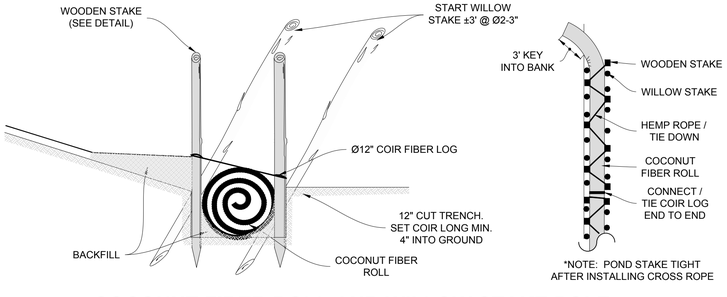
G WILLOW BAFFLE/TRENCH

SCALE: N.T.S.



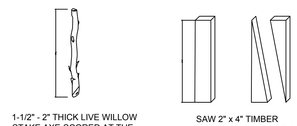
I CONCEPTUAL CROSS-SECTION AT STA 37+70

SCALE: N.T.S.



J COCONUT FIBER ROLL AND WILLOW STAKE POLE

SCALE: N.T.S.



1-1/2" - 2" THICK LIVE WILLOW STAKE AXE-SCORED AT THE BOTTOM TO FACILITATE ROOT GROWTH AFTER TREATMENT WITH ROOTING HORMONE; WILLOW STAKES SHALL BE SOAKED IN WATER FOR MIN. OF 24 HOURS PRIOR TO INSTALLATION.

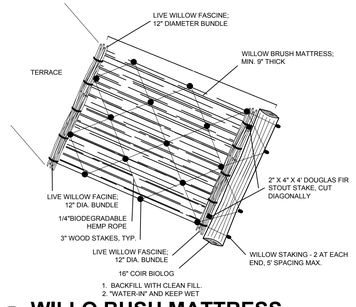
LIVE STAKE

SAW 2" x 4" TIMBER DIAGONALLY TO PRODUCE 2 DEAD STOUT STAKES

DEAD STAKE

K STAKES

SCALE: N.T.S.



1. BACKFILL WITH CLEAN FILL.
2. "WATER-IN" AND KEEP WET

L WILLO BUSH MATTRESS

SCALE: N.T.S.

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

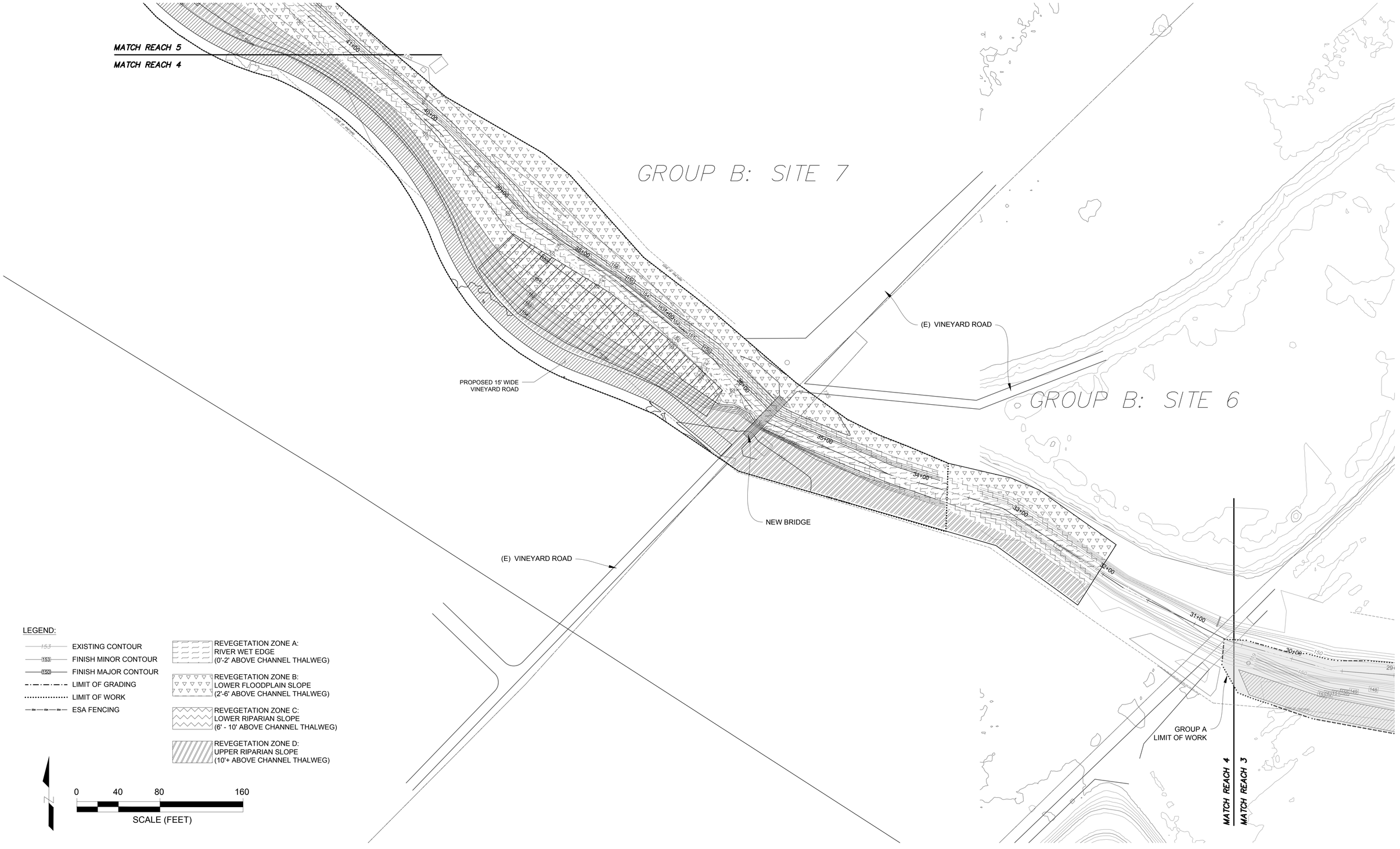
Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING DETAILS

BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size: D | Project: 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 11 OF 15

LAST SAVED: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB PLOT DATE: 8/12/2021
IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY
\\VELIANUS\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP B – GRADING DETAILS.DWG



IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\MELIANG\S\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP B - PLANTING.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

PLANTING PLAN - REACH 4
STA 30+50 TO 41+00
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size: D
Project: 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 12 OF 15

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF GRADING
- LIMIT OF WORK
- ESA FENCING

- REVEGETATION ZONE A: RIVER WET EDGE (0'-2' ABOVE CHANNEL THALWE
- REVEGETATION ZONE B: LOWER FLOODPLAIN SLOPE (2'-6' ABOVE CHANNEL THALWE
- REVEGETATION ZONE C: LOWER RIPARIAN SLOPE (6' - 10' ABOVE CHANNEL THALV
- REVEGETATION ZONE D: UPPER RIPARIAN SLOPE (10'+ ABOVE CHANNEL THALWE

(E) VINEYARD PARKING / SOLAR ARRAY

(E) PIPE

GROUP B: SITE 10

GROUP B: SITE 9

GROUP B: SITE 8

11

MATCH REACH 6

MATCH REACH 5

MATCH REACH 5

MATCH REACH 4

PROPOSED 15' WIDE VINEYARD ROAD

0 40 80 160

SCALE (FEET)

N

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\KELIANUS\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP B - PLANTING.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

PLANTING PLAN - REACH 5
STA 41+00 TO 51+50
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size: D
Project: 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 13 OF 15

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF GRADING
- LIMIT OF WORK
- ESA FENCING

- REVEGETATION ZONE A: RIVER WET EDGE (0'-2' ABOVE CHANNEL THALWEG)
- REVEGETATION ZONE B: LOWER FLOODPLAIN SLOPE (2'-6' ABOVE CHANNEL THALWEG)
- REVEGETATION ZONE C: LOWER RIPARIAN SLOPE (6' - 10' ABOVE CHANNEL THALWE
- REVEGETATION ZONE D: UPPER RIPARIAN SLOPE (10'+ ABOVE CHANNEL THALWEG)

GROUP B: SITE 11

(E) VINEYARD PARKING / SOLAR ARRAY

(E) PIPE

(E) PIPE

SITE 13

MATCH REACH 6

MATCH REACH 5

MATCH REACH 6

MATCH REACH 5

HIGHWAY 29

GROUP C
LIMIT OF WORK

0 40 80 160
SCALE (FEET)

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\AE\JANUS\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP B - PLANTING.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

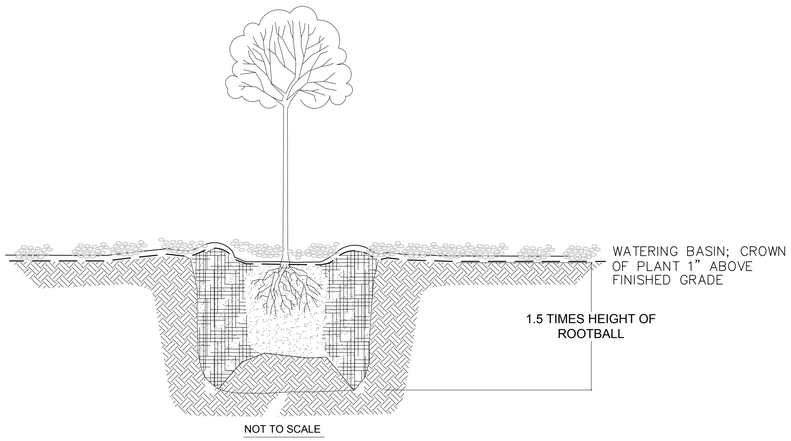
QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

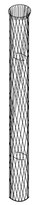
PLANTING PLAN - REACH 6
STA 51+50 TO 59+00
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 14 OF 15



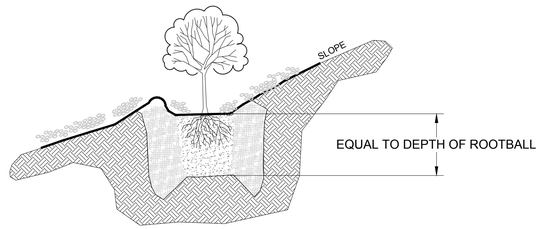
A TREE PLANTING

SCALE: N.T.S.



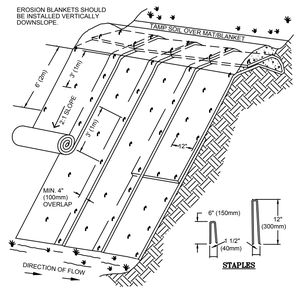
B RIGID SEEDLING PROTECTOR

SCALE: N.T.S.



C SHRUB PLANTING

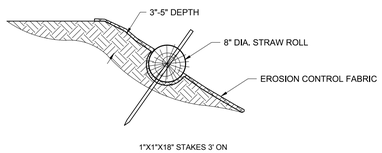
SCALE: N.T.S.



NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

D EROSION CONTROL FABRIC

SCALE: N.T.S.

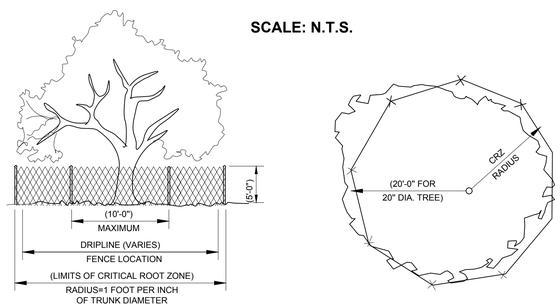


NOTE:

1. PLACE THE LOOSE EDGE OF THE STRAW WATTLES INTO A 4-INCH DEEP TRENCH AND SECURE WITH A SINGLE ROW OF STAPLES INSTALLED ON 12-INCH CENTERS. THEN PROCEED TO POSITION THE STRAW WATTLES INTO THE TRENCH ADJACENT TO THE SIDEWALK/BACK OF CURB/BACK OF V-DITCH.
2. DRIVE WOODEN 18-INCH STAKES THROUGH THE WATTLE ON APPROXIMATELY 3-FOOT CENTERS TO SECURE IN PLACE. CONSTRUCTION OF THE TRENCH AND PROPER STAPLE PLACEMENT IS NECESSARY TO PREVENT WATER AND SEDIMENT FROM FLOWING DIRECTLY UNDER THE SEDIMENT CONTROL WATTLE. WITH THIS TYPE OF INSTALLATION, WATER WILL ACCUMULATE BEHIND THE WATTLE, ALLOWING SEDIMENT LADEN WATER TO BE FILTERED THROUGH THE ROLL WHILE DEPOSITION OF SEDIMENT OCCURS BEHIND THE WATTLE.

E STRAW ROLL

SCALE: N.T.S.



F TREE PROTECTION FENCE

SCALE: N.T.S.

PLANTING LIST

Bale Slough Bear Creek Restoration Project - Planting Palette

RIPARIAN REVEGETATION CONTAINER PLANTINGS:

Container / Pole / Plug Plantings Acreage Total

Habitat Type: River Wet Edge (0'- 2' above channel thalweg)

	Biological Name / Common Name	Container	Quantity / ac	Spacing
Herbaceous	*Carex barbarae* / Santa Barbara Sedge	Super Stubby (L6)	2000	± 3' O.C.
	Carex praegracilis / California Field Sedge	Super Stubby (L6)	1000	
	Eleocharis macrostachya / Common Spike Rush	Super Stubby (L6)	500	
	Juncus balticus /Baltic Rush	Plug	1000	
	Juncus effusus var. brunneus / Common Rush	Super Stubby (L6)	500	

Habitat Type: Lower Floodplain Slope (2' - 6' above channel thalweg)

	Biological Name / Common Name	Container	Quantity / ac	Spacing
Trees	*Alnus rhombifolia* / White Alder	Treepot 4	65	± 10.5' O.C.
	Fraxinus latifolia / Oregon Ash	Treepot 4	30	
	Populus fremontii / Fremont's Cottonwood	Pole	20	
	Populus fremontii / Fremont's Cottonwood	Treepot 4	30	
	Salix laevigata / Red Willow	Pole	90	
	Salix lutea / Yellow Willow	Pole	40	
Shrubs	*Baccharis salicifolia* / Mule Fat	Deepot 40	20	± 20.0' O.C.
	Physocarpus capitatus/ Ninebark	1-Gallon	15	
	Rosa californica / California Wild Rose	1-Gallon	20	
	Symphoricarpos albus / Snowberry	1-Gallon	20	
Herbaceous	*Carex barbarae* / Santa Barbara Sedge	Super Stubby (L6)	1550	± 3' O.C.
	Carex praegracilis / California Field Sedge	Super Stubby (L6)	525	
	Eleocharis macrostachya / Common Spike Rush	Super Stubby (L6)	625	
	Elymus triticoides /Creeping Wildrye	Plug	1250	
	Euthamia occidentalis / Western Goldenrod	Liner	300	
	Juncus balticus /Baltic Rush	Plug	525	
	Juncus effusus var. brunneus / Pacific Rush	Super Stubby (L6)	525	
		Trees and Shrubs		
				Total

Habitat Type: Lower Riparian Slope (6' - 10' above channel thalweg)

	Biological Name / Common Name	Container	Quantity / ac	Spacing
Trees	*Alnus rhombifolia* / White Alder	Treepot 4	25	± 10' O.C.
	Fraxinus latifolia / Oregon Ash	Treepot 4	20	
	Populus fremontii / Fremont's Cottonwood	Pole	60	
	Populus fremontii / Fremont's Cottonwood	Treepot 4	30	
	Salix laevigata / Red Willow	Pole	80	
	Quercus agrifolia / Coast Live Oak	Treepot 4	15	
	Quercus lobata / Valley Oak	Treepot 4	20	
Shrubs	*Baccharis pilularis* / Coyote Bush	Deepot 40	30	± 15.5' O.C.
	Calycanthus occidentalis / Western Spice Bush	1-Gallon	20	
	Rosa californica / California Wild Rose	1-Gallon	20	
	Symphoricarpos albus / Snowberry	1-Gallon	60	
Herbaceous	*Carex barbarae* / Santa Barbara Sedge	Super Stubby (L6)	2000	± 3' O.C.
	Elymus triticoides /Creeping Wildrye	Plug	1500	
	Euthamia occidentalis / Western Goldenrod	Liner	500	
	Juncus balticus /Baltic Rush	Plug	500	
	Symphyotrichum chilense / Common Aster	Plug	500	
		Trees and Shrubs		
				Total

Habitat Type: Upper Riparian Slope (10' + above channel thalweg)

	Biological Name / Common Name	Container	Quantity / ac	Spacing
Trees	*Acer macrophyllum* / Big Leaf Maple	Treepot 4	20	± 13.5' O.C.
	Aesculus californica / California Buckeye	Treepot 4	20	
	Fraxinus latifolia / Oregon Ash	Treepot 4	15	
	Juglans californica / California Black Walnut	Treepot 4	30	
	Populus fremontii / Fremont's Cottonwood	Treepot 4	20	
	Salix laevigata / Red Willow	Pole	20	
	Quercus lobata / Valley Oak	Treepot 4	30	
	Quercus agrifolia / Coast Live Oak	Treepot 4	45	
	Umbellularia californica / Bay Laurel	Treepot 4	20	
Shrubs	*Achillea millefolium* / Yarrow	Deepot 40	35	± 13.0' O.C.
	Baccharis pilularis / Coyote Bush	Deepot 40	45	
	Calycanthus occidentalis / Western Spice Bush	1-Gallon	15	
	Heteromeles arbutifolia / Toyon	Treepot 4	15	
	Physocarpus capitatus/ Ninebark	1-Gallon	15	
	Ribes californicum/ California gooseberry	1-Gallon	15	
	Rosa californica / California Wild Rose	1-Gallon	55	
	Symphoricarpos albus / Snowberry	1-Gallon	50	
Vines	*Aristolochia californica*/ Pipe vine	1-Gallon	20	± 35.5' O.C.
	Lonicera hispidula / Honeysuckle	1-Gallon	15	
Herbaceous	*Bromus carinatus* / California Brome	Plug	325	± 3.5' O.C.
	Carex barbarae / Santa Barbara Sedge	Super Stubby (L6)	825	
	Elymus glaucus / Blue Wildrye	Plug	1050	
	Elymus triticoides /Creeping Wildrye	Plug	525	
	Festuca idahoensis / Idaho Fescue	Plug	525	
	Muhlenbergia rigens / Deergrass	1-Gallon	100	
	Symphyotrichum chilense / Common Aster	Plug	425	

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY
PLOT STYLE: ----
PLOT DATE: 8/12/2021
LAST SAVED: 8/12/2021
\\MEUNG\S\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\PLANTING DETAILS.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP B
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: ST
Drawn: KT
Checked: ST
Appr'd: ST

PLANTING DETAILS

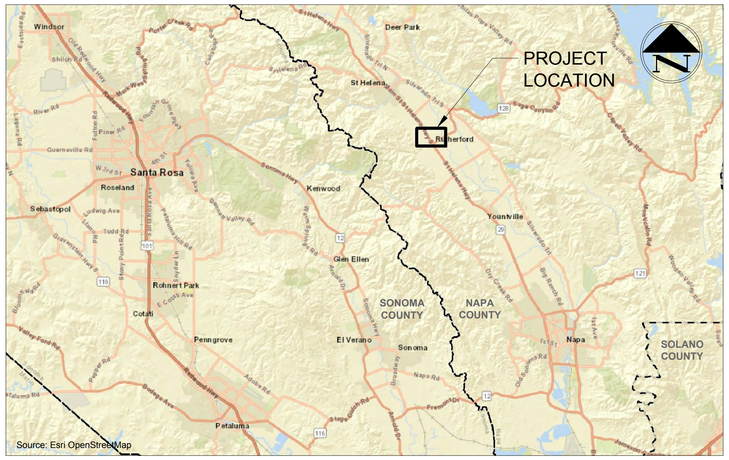
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: N.T.S.
Date: 8/12/21
Sheet: 14 OF 15

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT - GROUP C

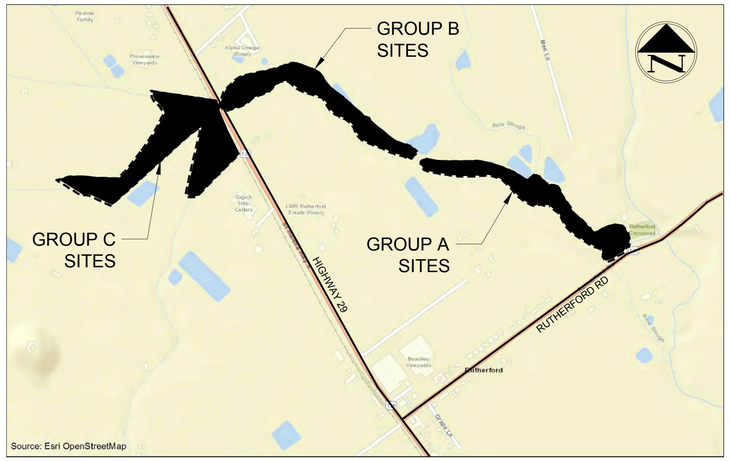
NAPA COUNTY, CA

65% DRAFT DESIGN PLANS



PROJECT LOCATION MAP

NO SCALE



PROJECT VICINITY MAP

NO SCALE

SHEET INDEX	
Sheet Number	Sheet Title
1	TITLE SHEET
2	SITE PREPARATION PLAN - REACH 7
3	SITE PREPARATION PLAN - REACH 8
4	SITE PREPARATION PLAN - REACH 9
5	GRADING PLAN - REACH 8
6	GRADING PLAN - REACH 8
7	GRADING PLAN - REACH 9
8	SECTIONS - FLOODPLAIN
9	GRADING DETAILS
10	GRADING DETAILS
11	PLANTING PLAN - REACH 7
12	PLANTING PLAN - REACH 8
13	PLANTING PLAN - REACH 9
14	PLANTING DETAILS

GENERAL NOTES

1. DESIGN INTENT: THESE PLANS AND SPECIFICATIONS REPRESENT THE DESIGN INTENT OF QUESTA ENGINEERING CORPORATION (THE ENGINEER), AS APPROVED BY THE NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT DEPARTMENT. THE CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS SHOWN ON THESE PLANS AND SPECIFICATIONS AND SHALL BE RESPONSIBLE FOR ANY DEVIATIONS FROM THESE PLANS AND ASSOCIATED RISK AND EXPENSE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A COPY OF THE APPROVED PLANS AND SPECIFICATIONS AND ANY ADDENDA AT THE JOB SITE AT ALL TIMES. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY UNFORESEEN CIRCUMSTANCES OR CONDITIONS THAT WOULD ALTER THESE PLANS AND SPECIFICATIONS FOR APPROVAL OF MODIFICATIONS TO THE INTENDED DESIGN.

2. COMPOSITE GROUND MAP: THE PROPOSED IMPROVEMENTS SHOWN ON THESE DRAWINGS ARE SUPERIMPOSED ON A BASE MAP. THIS BASE MAP IS COMPILED FROM A SURVEY, AND OTHER DATA AS MADE AVAILABLE TO THE ENGINEER, WHO SHALL NOT BE HELD LIABLE FOR CHANGES, INACCURACIES, OMISSIONS OR OTHER ERRORS ON THESE DOCUMENTS. THE COMPOSITE BASE MAP IS PROVIDED AS AN AID ONLY AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THESE DOCUMENTS AND INCORPORATING/INTEGRATING ALL CONSTRUCTION AS REQUIRED TO ACCOMMODATE THE SAME.

3. MATERIALS AND WORKMANSHIP: ALL MATERIALS, WORKMANSHIP, AND CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ~~NAPA COUNTY PUBLIC WORKS DEPARTMENT ENGINEERING STANDARD PLANS AND SPECIFICATIONS~~, AND THE CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) 2010 STANDARD PLANS AND SPECIFICATIONS UNLESS OTHERWISE NOTED. ALL MATERIAL SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.

4. PRE-CONSTRUCTION MEETING: A PRE-CONSTRUCTION MEETING SHALL BE ARRANGED BY THE CONTRACTOR AT THE JOB SITE PRIOR TO THE COMMENCEMENT OF WORK. THE MEETING SHALL BE ATTENDED BY THE OWNER, CONTRACTOR (INCLUDING SITE FOREMAN AND KEY PERSONNEL), ENGINEER, AND REPRESENTATIVES OF ANY INVOLVED REGULATORY AGENCIES. PROSPECTIVE PARTICIPANTS SHALL BE NOTIFIED OF THE MEETING A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO THE MEETING. THE PURPOSE OF THE MEETING IS TO REVIEW THE WORK PLAN AND PROVIDE CLARIFICATIONS, REVIEW JOB REQUIREMENTS, AND DISCUSS CONDITIONS OF ANY PERMITS. SPECIAL ATTENTION WILL BE PAID TO ANY WETLANDS, SOIL EROSION AND WATER QUALITY PROTECTION REQUIREMENTS. NOTICE FOR THE CONTRACTOR TO PROCEED WITH WORK SHALL BE PROVIDED AT COMPLETION OF THE PRE-CONSTRUCTION MEETING.

5. RESOURCE PROTECTION: THE CONTRACTOR IS ADVISED OF THE PRESENCE OF SENSITIVE RESOURCES LOCATED NEAR PROJECT WORK AREAS. THE TRAIL ALIGNMENT, FENCING, STAGING AREAS AND ALL OTHER PROJECT FACILITIES HAVE BEEN CAREFULLY LOCATED TO AVOID PHYSICAL DISTURBANCE OF SENSITIVE RESOURCES. ALL CONTRACTOR ACTIVITIES, INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION ACTIVITIES, VEHICLE MAINTENANCE, AND MATERIALS AND EQUIPMENT STORAGE AND STAGING, MUST BE STRICTLY CONFINED TO THE WORK AREAS SHOWN ON THE DRAWINGS. THE LIMITS OF WORK WILL BE CAREFULLY LOCATED IN THE FIELD BY THE CONTRACTOR AND ENGINEER OF RECORD, AND ALL WORK LIMIT AREAS WILL BE PROTECTED BY STRAW WATTLES, CONSTRUCTION BARRIER FENCING, AND/OR ESA\SILT FENCING AS SHOWN ON THE DRAWINGS.

   CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PENALTIES AND ALL REPAIRS AND MITIGATIONS IMPOSED DUE TO BREACH OF PROTOCOL AND UNAUTHORIZED INTRUSION INTO SENSITIVE RESOURCE AREAS.

6. COMPLETION SCHEDULE: CONTRACTOR SHALL PROVIDE ENGINEER WITH A PROJECT CONSTRUCTION COMPLETION SCHEDULE WITHIN 10 WORKING DAYS OF AWARD OF CONTRACT AND REVIEW THIS SCHEDULE AND ANY CHANGES AT PRE-CONSTRUCTION MEETING. SITE IMPROVEMENTS, INCLUDING TRAIL CONSTRUCTION MUST BE COMPLETED PRIOR TO THE DATE SPECIFIED IN THE CONTRACT DOCUMENTS.

7. UTILITIES: CONTRACTOR SHALL NOTIFY ALL PUBLIC AND PRIVATE UTILITY COMPANIES IN THE PROJECT AREA A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR MUST INVESTIGATE AND VERIFY THE LOCATION OF ANY EXISTING UTILITIES WITHIN THE PROJECT AREA. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY, LOCATE, AND PROTECT ALL UTILITIES. ANY UTILITIES PLOTTED ON THE PLANS ARE CONSIDERED TENTATIVE AND APPROXIMATIONS AND THEREFORE, NO WARRANTY EXPRESSED OR IMPLIED IS MADE AS TO THE COMPLETENESS OR CORRECTION OF THEIR LOCATION. THE UTILITY COMPANIES ARE THOUGHT TO BE MEMBERS OF THE UNDERGROUND SERVICE ALERT (U.S.A.) ON-CALL PROGRAM. THE CONTRACTOR SHALL NOTIFY U.S.A. 72-HOURS IN ADVANCE OF PERFORMING EXCAVATION WORK AT 1-800-227 2600, 7:00 AM TO 5:00 PM, MONDAY THROUGH FRIDAY. EXISTING PUBLIC UTILITIES SHALL BE KEPT IN SERVICE AT ALL TIMES. UTILITIES THAT INTERFERE WITH THE WORK TO BE PERFORMED SHALL BE PROTECTED AS REQUIRED BY THE COUNTY, PG&E, AT&T, AND ALL OTHER AFFECTED AGENCIES.

8. DAMAGE AND PROTECTION OF EXISTING FACILITIES: CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING FACILITIES, AND ANY OTHER IMPROVEMENTS FROM DAMAGE RESULTING FROM CONTRACTOR'S WORK, INCLUDING ALL UTILITIES, PUBLIC AND PRIVATE. CONTRACTOR SHALL EXERCISE CARE TO AVOID EXCESSIVE DAMAGE TO EXISTING PUBLIC PROPERTY, INCLUDING STREETS, PARKING AREAS, NATIVE TREES, SHRUBS, WETLANDS, AND OTHER PROPERTY IMPROVEMENTS. IF CONTRACTOR CAUSES DAMAGES TO SUCH ITEMS, THEY SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT IN LIKE NUMBER, KIND, CONDITION AND SIZE. THE COST OF REPAIRS AND REPLACEMENT OF DAMAGED PROPERTY SHALL BE AT THE CONTRACTOR'S EXPENSE. ANY SUCH COSTS MAY BE DEDUCTED BY THE CLIENT FROM MONIES DUE CONTRACTOR UNDER THIS CONTRACT.

9. JOB SITE CONDITIONS, TRAFFIC CONTROL AND CONTRACTOR RESPONSIBILITY: CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY, TRAFFIC CONTROL, AND ACCESS TO AND FROM ADJOINING DRIVEWAYS AND STREETS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD COUNTY AND THE ENGINEER (QUESTA ENGINEERING CORPORATION) HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPT FROM LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE CLIENT OR THE ENGINEER. CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING CONSTRUCTION, INCLUDING SAFETY OF PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

   ALL WORK SHALL BE IN COMPLIANCE WITH APPLICABLE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARDS AS SET FORTH BY THE FEDERAL DEPARTMENT OF LABOR AND/OR THE STATE OF CALIFORNIA. THE CONTRACTOR SHALL SECURE A TRENCH PERMIT FROM THE CALIFORNIA DIVISION OF INDUSTRIAL SAFETY (CalOSHA) PRIOR TO EXCAVATION OF ANY TRENCH GREATER THAN FIVE (5) FEET IN DEPTH.

   ALL TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CALTRANS MANUAL OF TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OF WORK ZONES. ALL SIGNS SHALL BE APPROPRIATELY CONSTRUCTED WITH REFLECTIVE MATERIAL ON A BACKING OF METAL OR FABRIC (NO WOOD OR PLASTIC ALLOWED) AND SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION TO PROVIDE PROPER VISIBILITY, PER SECTION 12 OF THE CALTRANS SPECIAL PROVISIONS.

   THE CONTRACTOR SHALL MAINTAIN REASONABLE ACCESS TO ALL DRIVEWAYS DURING CONSTRUCTION.

10. CLARIFICATION, CHANGE ORDERS, AND ADDITIONAL WORK: SHOULD ANY CONTRACTOR OR SUBCONTRACTOR FIND ANY DEFICIENCIES, ERRORS, CONFLICTS, OR OMISSIONS IN THESE PLANS AND SPECIFICATIONS, OR SHOULD THERE BE ANY DOUBT AS TO THEIR MEANING OR INTENT, THEN THE CONTRACTOR SHALL NOTIFY JOINTLY, CLIENT AND THE DESIGN ENGINEER (QUESTA ENGINEERING CORPORATION) FOR A WRITTEN CLARIFICATION, ADDENDUM, ETC. SHOULD THE CONTRACTOR FAIL TO DO SO BEFORE SUBMITTING AN INVOICE FOR ADDITIONAL WORK, THE CONTRACTOR CANNOT CLAIM ADDITIONAL COMPENSATION FOR WORK REQUIRED TO COMPLETE THE PROJECT. THE EXCEPTION IS EMERGENCY WORK AS DEFINED IN THE CALTRANS STANDARDS.

    THE CLIENT OR ENGINEER OF RECORD, ACTING ON BEHALF OF THE CLIENT, MAY REQUIRE PLAN REVISIONS DUE TO UNFORESEEN CIRCUMSTANCES AND CONFLICTS OCCURRING DURING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY, JOINTLY THE CLIENT AND THE ENGINEER OF RECORD OF ANY SUCH WORK THAT IS ADDITIONAL AND SUBMIT A WRITTEN COST-ESTIMATE FOR SUCH WORK. "EXTRA WORK" AND WRITTEN CHANGE ORDERS WILL BE EXECUTED UPON THE RECOMMENDATION OF THE ENGINEER.

11. PAYMENTS: PAYMENT SHALL BE BASED ON COMPLETED CONTRACTOR'S BID SHEET AND ISSUED WRITTEN CHANGE ORDERS. THE ENGINEER OF RECORD SHALL VERIFY FIELD MEASUREMENTS AND CONTRACTOR QUANTITY ESTIMATES, WHERE APPLICABLE, AND UNLESS OTHERWISE NOTED.

12. MISCELLANEOUS: WRITTEN DIMENSIONS ALWAYS TAKE PRECEDENCE OVER SCALED DIMENSIONS IF THERE IS A CONFLICT. THE CONTRACTOR SHALL CONTACT THE ENGINEER TO OBTAIN ADDITIONAL CLARIFICATION. NO DEVIATION OR SUBSTITUTION SHALL BE ALLOWED WITHOUT OBTAINING PRIOR WRITTEN APPROVAL FROM THE ENGINEER.

13. EROSION CONTROL: EROSION CONTROL SHALL BE IN ACCORDANCE WITH THESE DRAWINGS AND CONTRACTOR SHALL PREPARE A SWPPP FOR SUBMITTAL AND APPROVAL BY THE CLIENT. ALL DISTURBED AREAS SHALL BE COVERED WITH WEED-FREE STRAW TO PREVENT EROSION. SUBSEQUENTLY ALL DISTURBED AREAS SHALL BE SEEDED WITH NATIVE GRASS SEED.

14. EARTHWORK AND OFFHAUL: SUITABLE EXCAVATED MATERIAL CAN BE USED IN DESIGNATED FILL AREAS (i.e. BERMS, ISLANDS, BANK GRADING, VEGETATED MOUND AREAS. EXCESS MATERIAL SHALL BE DISPOSED OF OFF-SITE BY THE CONTRACTOR.

15. CONSTRUCTION STAGING: STAGING AREAS FOR CONSTRUCTION ACTIVITIES ARE SHOWN ON SHEET 3: SITE PROTECTION, DEMOLITION, AND STAGING. THE CONTRACTOR IS LIMITED TO THESE AREAS UNLESS OTHERWISE NOTIFIED IN WRITING BY THE CLIENT OR ENGINEER.

ABBREVIATIONS

"T	= TREE (APPROX. ø @ BREAST HEIGHT)	GP	= GATE POST
AP	= ANGLE POINT	GR	= GROUND ELEVATION
AB	= AGGREGATE BASE	MHW	= MEAN HIGH WATER
BO	= BOTTOM OF	MLW	= MEAN LOW WATER
BOL	= BOLLARD	<N>	= NEW
BP	= BEGINNING POINT	NOM	= NOMINAL
BRC	= BACK OF ROLL CURB	<P>	= PROPOSED
CONC	= CONCRETE	P	= PAVEMENT
CD	= CHECK DAM	PT	= PRESSURE TREATED
CY	= CUBIC YARDS	S	= SIGN
DL	= DAYLIGHT	SIM	= SIMILAR
<E>	= EXISTING	SF	= SQUARE FEET
EG	= EXISTING GRADE	SWL	= SWALE
EL	= ELEVATION	T	= TOP OF SLOPE
EOP	= EDGE OF PAVEMENT	t	= TOE OF SLOPE
EP	= ENDING POINT	TB	= TOP OF BERM
ESA	= ENVIRONMENTALLY SENSITIVE AREA	TO	= TOP OF
F	= FENCE	TOC	= TOP OF CONCRETE
FG	= FINISHED GRADE	TW	= TOP OF WALL
FL	= FLOW LINE	WLK	= WALK
GB	= GRADE BREAK		
GL	= GUTTER LIP		

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

TITLE SHEET

BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 1 OF 15

\\ALAMEDA\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\TITLE AND PAV_OVERVIEW SHEETS.DWG LAST SAVED: 8/12/2021 PLOT DATE: 1/4/2021 PLOT STYLE:QUESTA-GRAYSCALE-25%.CTB

SHEET NOTES:

1. INSTALL AND MAINTAIN SILT FENCE ALONG THE TOP OF THE ACTIVE CHANNEL BANK FOR ALL GRADING AREAS.
2. PRIOR TO COMMENCING CONSTRUCTION, INSTALL SILT FENCE AND TREE PRESERVATION FENCING.

TREE PROTECTION

3. ONLY TREES GREATER THAN 12" DIAMETER ARE SHOWN ON THE PLANS. CONTRACTOR TO PROTECT ALL TREES, EXCEPT THOSE SLATED FOR REMOVAL, REGARDLESS OF SIZE.
4. TREE PRESERVATION IS A PRIORITY TO MAINTAIN CANOPY COVER. CLUSTERS OF (E) MATURE TREES TO BE PRESERVED AS TREE ISLANDS AS NOTED.

USE OF SITE

5. THE PROJECT SITE IS ON PRIVATE PROPERTY. THE CONTRACTOR SHALL ONLY USE SITE ACCESS ROUTES TO THE SITE AS NOTED ON THE DRAWINGS.
6. STAGING, STORAGE, AND TEMPORARY STOCKPILING SHALL BE LIMITED TO THE AREAS INDICATED ON THE DRAWINGS.
7. THE CONTRACTOR SHALL ONLY OPERATE EQUIPMENT WITHIN THE LIMITS OF GRADING AND ALONG APPROVED ACCESS ROUTES WITHIN THE SITE.
8. DRAWINGS SHOW SUGGESTED ACCESS ROUTES WITHIN THE SITE. THE CONTRACTOR SHALL LIMIT IT'S ACCESS TO THESE LOCATIONS, AND/OR ALTERNATIVE ROUTE(S) AS APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVES.

TREES TO BE REMOVED = 19 nos

TREE#	QTY.	SPECIES	DIAMETER
184	6	WILLOW	10
185	6	WILLOW	10
186	6	WILLOW	10
187	1	VALLEY OAK	6



0 40 80 160
SCALE (FEET)

LEGEND:

- EXISTING CONTOUR
- PARCEL LINE
- LIMIT OF WORK
- ESA FENCING
- EXISTING TREE
- SITE ACCESS
- CONSTRUCTION ENTRANCE
- STAGING AREA

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\KELIANG\S\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C – SITE PREP.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

SITE PREPARATION PLAN - REACH 7
60+00 TO 73+00
BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 2 OF 14

SHEET NOTES:

1. INSTALL AND MAINTAIN SILT FENCE ALONG THE TOP OF THE ACTIVE CHANNEL BANK FOR ALL GRADING AREAS.
2. PRIOR TO COMMENCING CONSTRUCTION, INSTALL SILT FENCE AND TREE PRESERVATION FENCING.

TREE PROTECTION

3. ONLY TREES GREATER THAN 12" DIAMETER ARE SHOWN ON THE PLANS. CONTRACTOR TO PROTECT ALL TREES, EXCEPT THOSE SLATED FOR REMOVAL, REGARDLESS OF SIZE.
4. TREE PRESERVATION IS A PRIORITY TO MAINTAIN CANOPY COVER. CLUSTERS OF (E) MATURE TREES TO BE PRESERVED AS TREE ISLANDS AS NOTED.

USE OF SITE

5. THE PROJECT SITE IS ON PRIVATE PROPERTY. THE CONTRACTOR SHALL ONLY USE SITE ACCESS ROUTES TO THE SITE AS NOTED ON THE DRAWINGS.
6. STAGING, STORAGE, AND TEMPORARY STOCKPILING SHALL BE LIMITED TO THE AREAS INDICATED ON THE DRAWINGS.
7. THE CONTRACTOR SHALL ONLY OPERATE EQUIPMENT WITHIN THE LIMITS OF GRADING AND ALONG APPROVED ACCESS ROUTES WITHIN THE SITE.
8. DRAWINGS SHOW SUGGESTED ACCESS ROUTES WITHIN THE SITE. THE CONTRACTOR SHALL LIMIT IT'S ACCESS TO THESE LOCATIONS, AND/OR ALTERNATIVE ROUTE(S) AS APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVES.

LEGEND:

- EXISTING CONTOUR
- PARCEL LINE
- LIMIT OF WORK
- ESA FENCING
- EXISTING TREE
- SITE ACCESS
- CONSTRUCTION ENTRANCE
- STAGING AREA

0 40 80 160

1:480.0011

GRADING LIMITS, TYP.

LIMIT OF WORK

STAGING AREA

EQUIPMENT PAD, PIP

PIPE, PIP

GROUP C: SITE 13

GROUP C: SITE 14

MATCH REACH 8

MATCH REACH 7

MATCH REACH 9

MATCH REACH 8

MATCH REACH 8

MATCH REACH 6

CH FILL AREA

CH REACH 8 OR 9

HWY 29

GROUP B PROJECT AREA

© 2020 Microsoft Corporation © 2020 Maxar ©CNES (2020) Distribution Airbus DS

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB
\\ELIANUS\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C - SITE PREP.DWG
IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C

NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

SITE PREPARATION PLAN - REACH 8
100+00 TO 110+50

BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size: D | Project: 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 3 OF 14

SHEET NOTES:

1. INSTALL AND MAINTAIN SILT FENCE ALONG THE TOP OF THE ACTIVE CHANNEL BANK FOR ALL GRADING AREAS.
2. PRIOR TO COMMENCING CONSTRUCTION, INSTALL SILT FENCE AND TREE PRESERVATION FENCING.

TREE PROTECTION

3. ONLY TREES GREATER THAN 12" DIAMETER ARE SHOWN ON THE PLANS. CONTRACTOR TO PROTECT ALL TREES, EXCEPT THOSE SLATED FOR REMOVAL, REGARDLESS OF SIZE.
4. TREE PRESERVATION IS A PRIORITY TO MAINTAIN CANOPY COVER. CLUSTERS OF (E) MATURE TREES TO BE PRESERVED AS TREE ISLANDS AS NOTED.

USE OF SITE

5. THE PROJECT SITE IS ON PRIVATE PROPERTY. THE CONTRACTOR SHALL ONLY USE SITE ACCESS ROUTES TO THE SITE AS NOTED ON THE DRAWINGS.
6. STAGING, STORAGE, AND TEMPORARY STOCKPILING SHALL BE LIMITED TO THE AREAS INDICATED ON THE DRAWINGS.
7. THE CONTRACTOR SHALL ONLY OPERATE EQUIPMENT WITHIN THE LIMITS OF GRADING AND ALONG APPROVED ACCESS ROUTES WITHIN THE SITE.
8. DRAWINGS SHOW SUGGESTED ACCESS ROUTES WITHIN THE SITE. THE CONTRACTOR SHALL LIMIT IT'S ACCESS TO THESE LOCATIONS, AND/OR ALTERNATIVE ROUTE(S) AS APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVES.

LEGEND:

- 153 EXISTING CONTOUR
- PARCEL LINE
- LIMIT OF WORK
- ESA FENCING
- EXISTING TREE
- SITE ACCESS
- CONSTRUCTION ENTRANCE
- STAGING AREA

0 40 80 160

1:480.001

LIMIT OF WORK

GRADING LIMITS, TYP.

CUT FROM LOWER FLOOD PLAIN WILL BE HAULED TO FILL THE VINEYARD AT THE UPPER FLOOD PLAIN

MATCH FILL AREA
MATCH REACH 8 OR 9

MATCH REACH 9

MATCH REACH 8

© 2020 Microsoft Corporation © 2020 Maxar ©CNES (2020) Distribution Airbus DS

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

I:\AELANUS\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C – SITE PREP.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

SITE PREPARATION PLAN - REACH 9
110+50 TO 120+00
BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 4 OF 14

N

0 60 120 240

SCALE (FEET)

LEGEND:

- EXISTING CONTOUR
- PARCEL LINE
- LIMIT OF WORK
- ESA FENCING
- EXISTING TREE
- SITE ACCESS
- CONSTRUCTION ENTRANCE
- STAGING AREA



BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

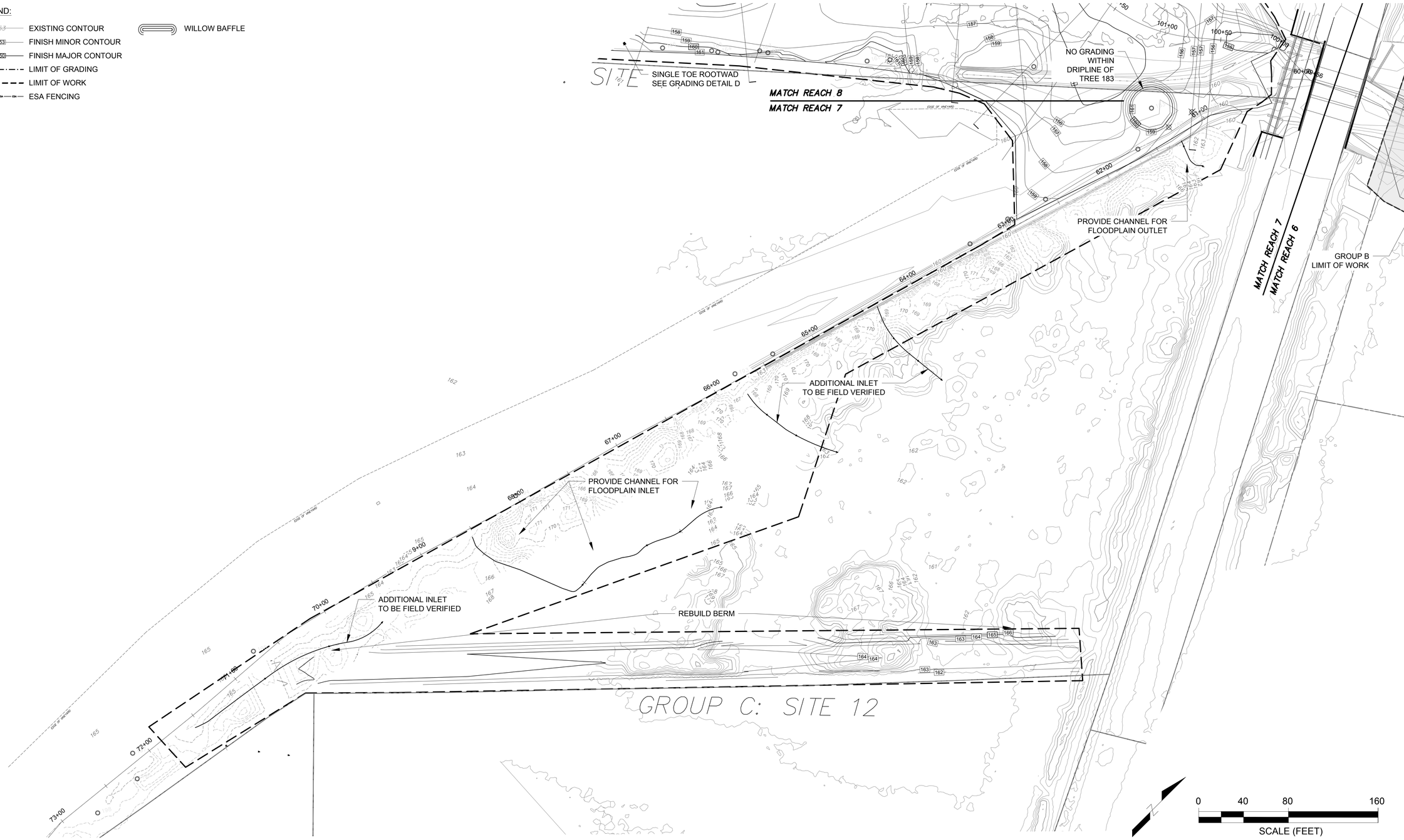
SITE PREPARATION PLAN - REACH 7
60+00 TO 73+00
BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 5 OF 14

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY
LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB
\\KELIANG\V\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C - SITE PREP.DWG

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF GRADING
- LIMIT OF WORK
- ESA FENCING
- WILLOW BAFFLE



BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

GRADING PLAN - REACH 7
60+00 TO 73+00
BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 6 OF 15

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY
LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA–GRAYSCALE–255.CTB
\\AELIANUS\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C – GRADING.DWG

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF GRADING
- LIMIT OF WORK
- ESA FENCING
- WILLOW BAFFLE

N

0 40 80 160

SCALE (FEET)

LIMIT OF WORK

TREE SLASHES ON UPLAND. SEE DETAIL H

(N) ACCESS ROAD

GRADING LIMITS, TYP.

WOODY DEBRIS. SEE GRADING DETAIL B

WOODY DEBRIS. SEE GRADING DETAIL B

GROUP C: SITE 13

MATCH FILL AREA

MATCH REACH 8 OR 9

POINT BAR APEX JAM. SEE GRADING DETAIL C

POINT BAR APEX JAM. SEE GRADING DETAIL C

SECONDARY CHANNEL

WILLOW STAKE. SEE DETAIL F

POINT BAR APEX JAM. SEE GRADING DETAIL C

EQUIPMENT PAD, PIP

PIPE, PIP

MATCH REACH 8

MATCH REACH 6

GROUP B LIMIT OF WORK

NO GRADING WITHIN DRIPLINE OF TREE 183

SINGLE TOE ROOTWAD SEE GRADING DETAIL D

GROUP C: SITE

MATCH REACH 9

MATCH REACH 8

MATCH REACH 8

MATCH REACH 7

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

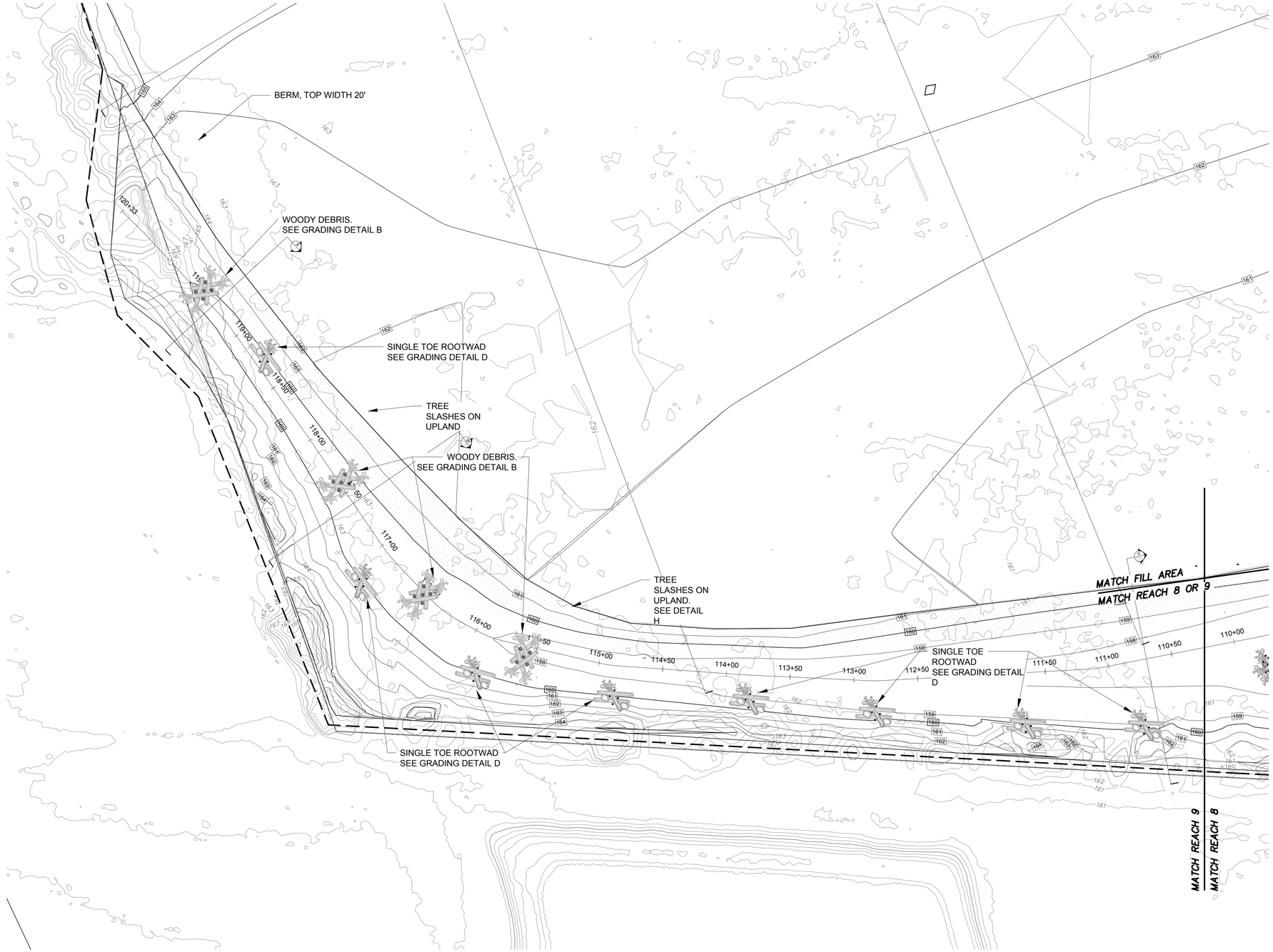
GRADING PLAN - REACH 8
100+00 TO 110+50
BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 7 OF 15

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB
IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY
\\AELIAN\S\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C – GRADING.DWG

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF GRADING
- LIMIT OF WORK
- ESA FENCING
- WILLOW BAFFLE



0 40 80 160

SCALE (FEET)

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

GRADING PLAN - REACH 9
110+50 TO 120+00
BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size: D | Project: 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 8 OF 15

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\KELIANG\V\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C – GRADING.DWG

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF GRADING
- LIMIT OF WORK
- ESA FENCING
- WILLOW BAFFLE

GROUP C: FILL AREA

GROUP C: SITE

TREE SLASHES

ALL CUT IN GROUP C WILL BE DELIVERED TO FILL AREA AS FILL

MATCH FILL AREA REACH B OR

MATCH REACH B OR

0 40 80 160

SCALE (FEET)

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C

NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

GRADING PLAN - FILL AREA

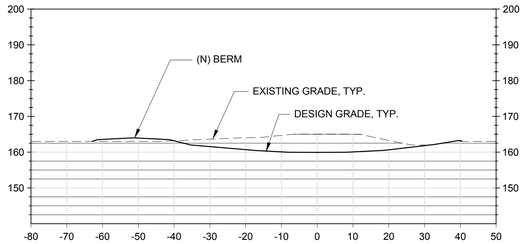
BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 9 OF 15

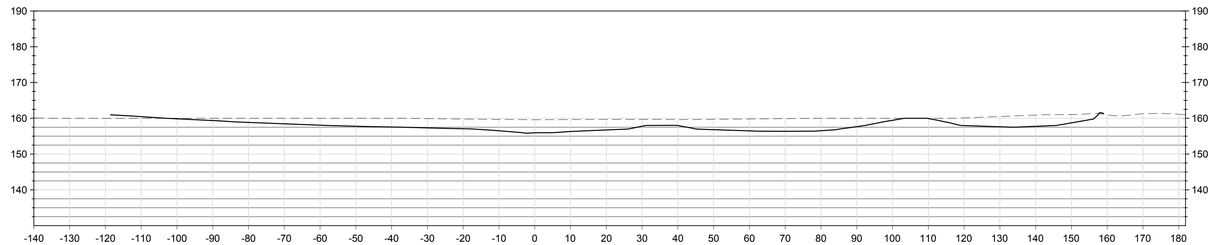
IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

PLOT STYLE: QUESTA–GRAYSCALE–255.CTB
PLOT DATE: 8/12/2021
LAST SAVED: 8/12/2021

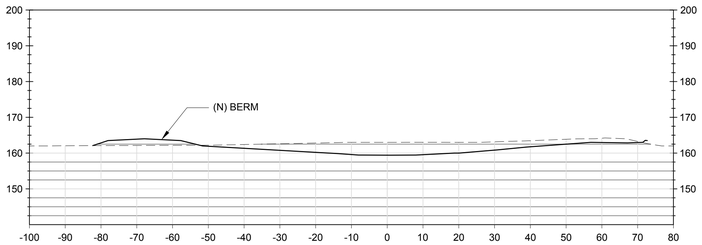
\\VALUANUS\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C – GRADING.DWG



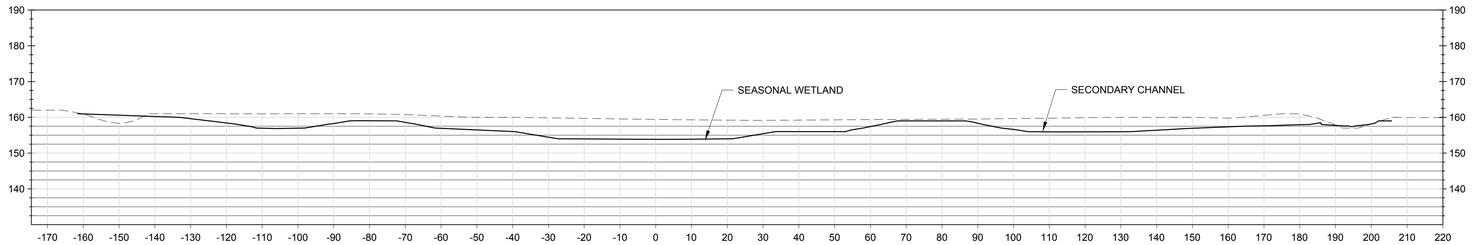
X SECTION AT STA 119+30
SCALE: 1" = 20'



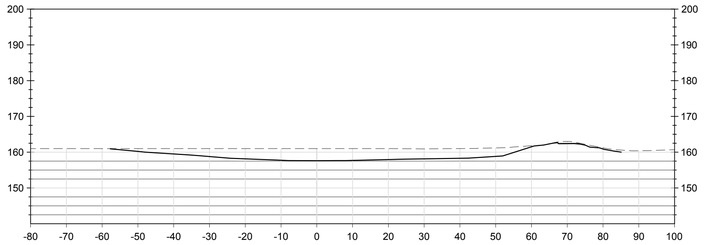
T SECTION AT STA 105+60
SCALE: 1" = 20'



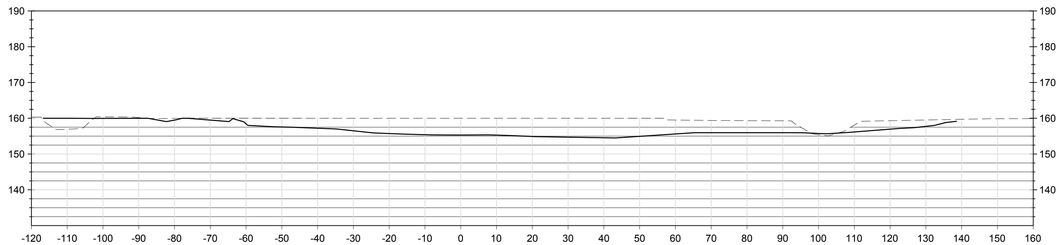
W SECTION AT STA 117+40
SCALE: 1" = 20'



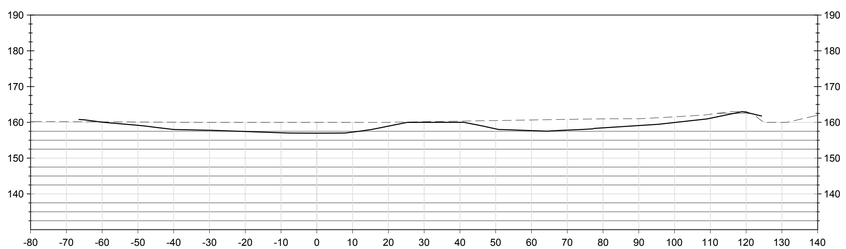
S SECTION AT STA 103+40
SCALE: 1" = 20'



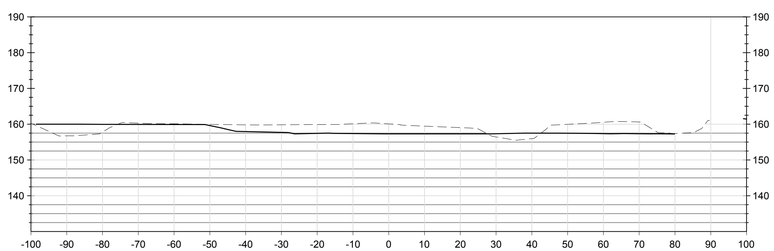
V SECTION AT STA 110+70
SCALE: 1" = 20'



R SECTION AT STA 101+70
SCALE: 1" = 20'



U SECTION AT STA 108+30
SCALE: 1" = 20'



Q SECTION AT STA 100+70
SCALE: 1" = 20'

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

LAST SAVED: 8/12/2021 PLOT DATE:

\\AEUANAS\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C – GRADING.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

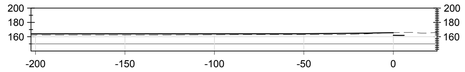
SECTIONS - FLOODPLAIN

BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 10 OF 15

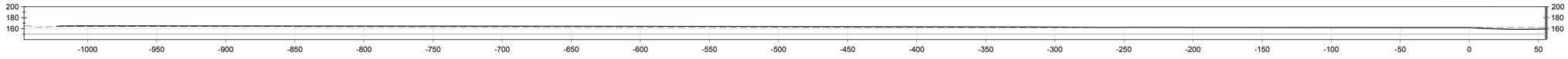
FILL AREA | SITE 13~14

168+06.42



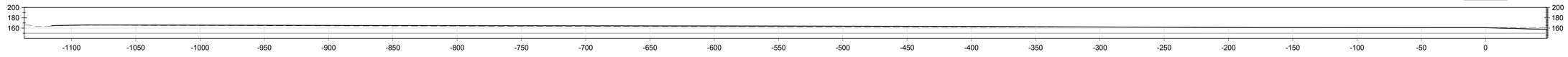
Y5 SECTION AT STA 168+06.42
SCALE: 1" = 40'

161+83.58



Y4 SECTION AT STA 161+83.58
SCALE: 1" = 40'

158+38.52



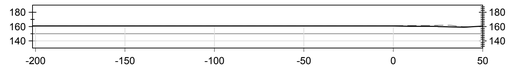
Y3 SECTION AT STA 158+38.52
SCALE: 1" = 40'

153+48.08



Y2 SECTION AT STA 153+48.08
SCALE: 1" = 40'

150+43.85



Y1 SECTION AT STA 150+43.85
SCALE: 1" = 40'

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

PLOT DATE: 8/12/2021

LAST SAVED: 8/12/2021

\\VELIANUS\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C - GRADING.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

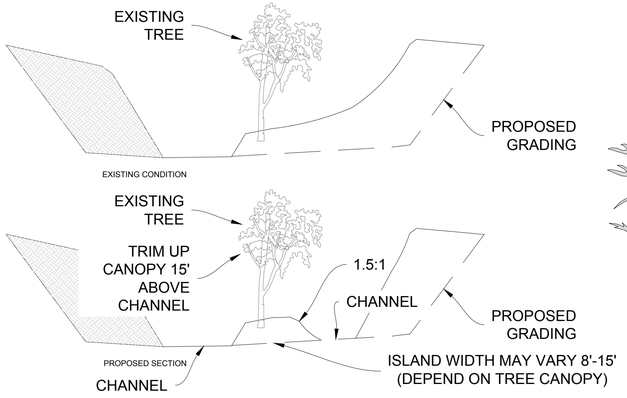
Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

FILL AREA SECTION

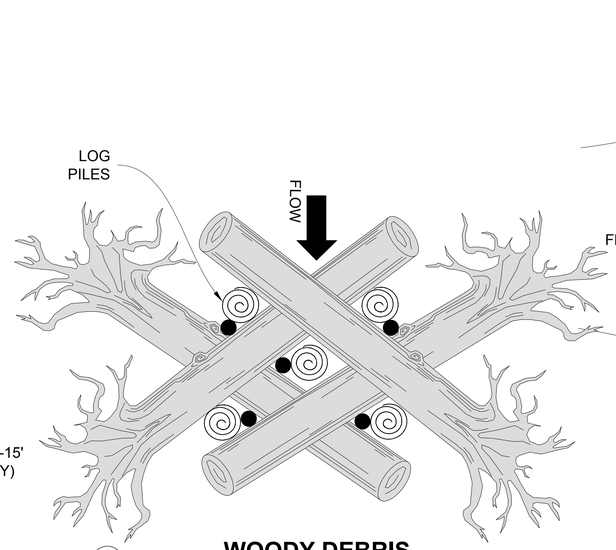
BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size: D
Project: 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 11 OF 15



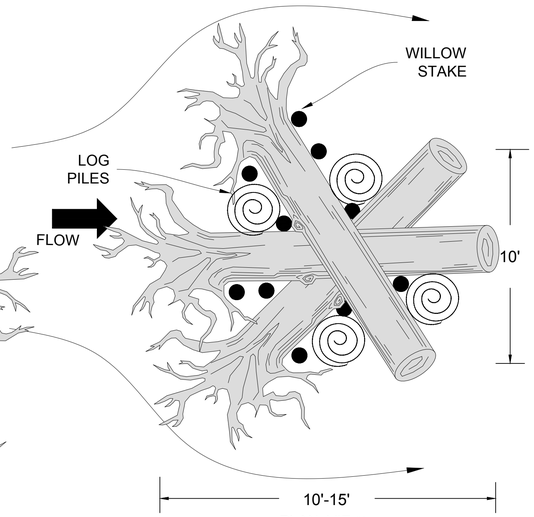
A NEAR INVERT TREE GRADING

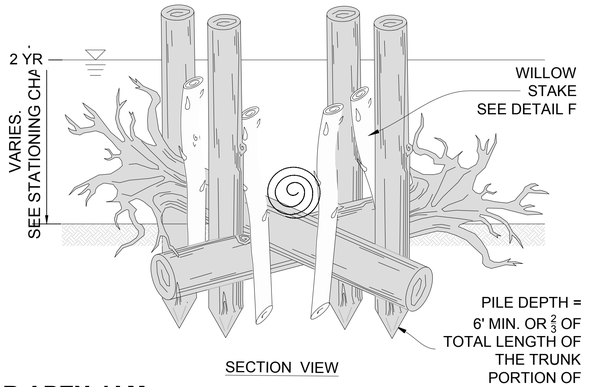
SCALE: N.T.S.



B WOODY DEBRIS

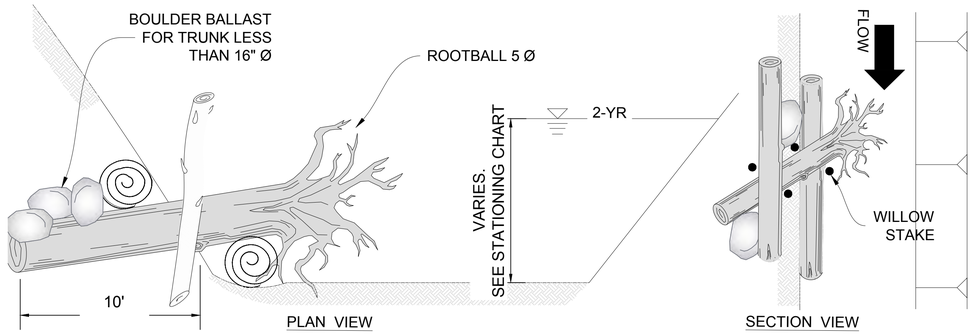
SCALE: N.T.S.





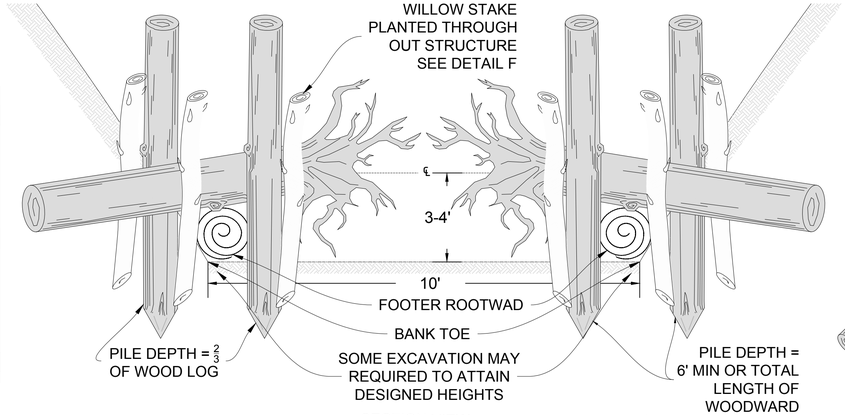
C POINT BAR APEX JAM

SCALE: N.T.S.



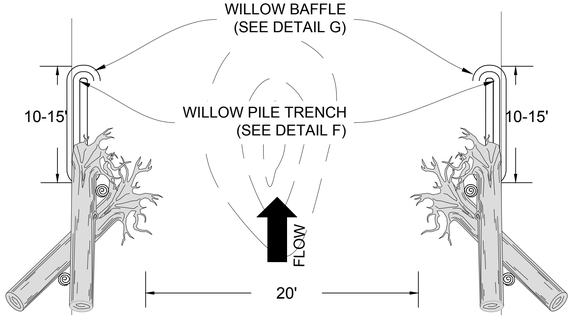
D SINGLE TOE ROOTWAD

SCALE: N.T.S.



E OPPOSING ROOTWADS

SCALE: N.T.S.



BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

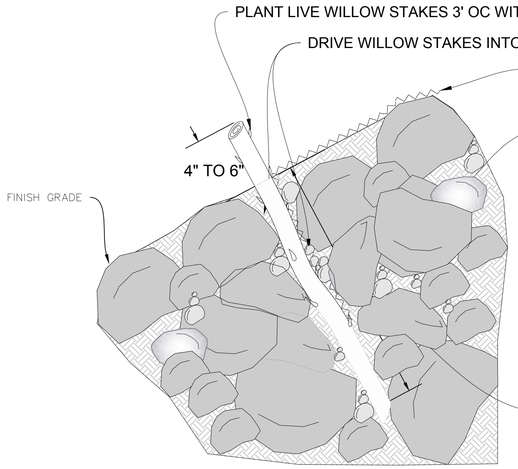
Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

GRADING DETAILS

BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/2021
Sheet: 12 OF 15

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY
\\ALAMO\S\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C – GRADING DETAILS.DWG

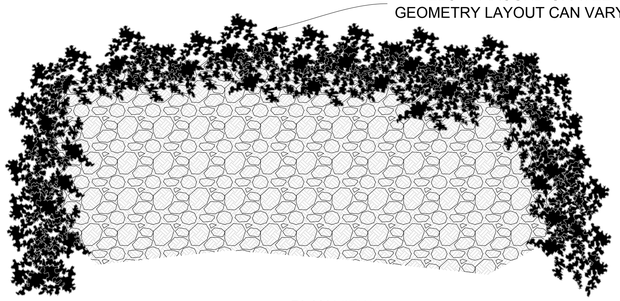


LIVE WILLOW STAKE NOTES:

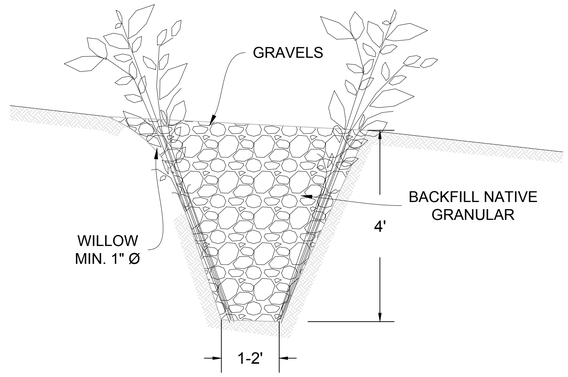
1. WILLOW STAKES WILL BE PROVIDED BY THE STATE.
2. CONTRACTOR RESPONSIBLE FOR PROVIDING SOURCE DOCUMENTATION TO ENGINEER.
3. CONTRACTOR TO AID WITH INSTALLATION.
4. EACH STAKE SHALL BE 1.5" THICK AT THE CUT END TO FACILITATE ROOT GROWTH AFTER TREATMENT WITH ROOTING HORMONE.
5. INSERT MIN 36" INTO GRIOUND SO THAT CUT END HAS ACCESS TO WATER.

F WILLOW STAKING IN ROCK RIP RAP

SCALE: N.T.S.



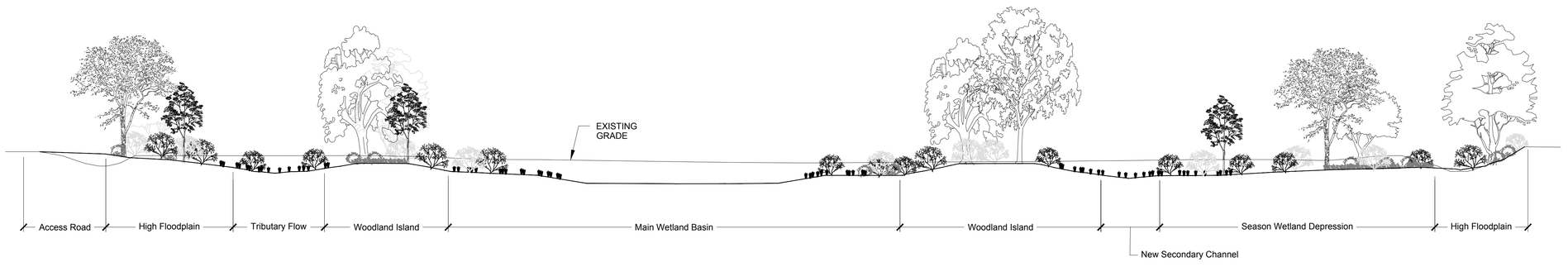
PLAN VIEW



SECTION VIEW

G WILLOW BAFFLE/TRENCH

SCALE: N.T.S.



H CONCEPTUAL CROSS-SECTION AT STA 103+50

SCALE: N.T.S.

LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB
IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY
\\ALAMEDA\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C – GRADING DETAILS.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

GRADING DETAILS

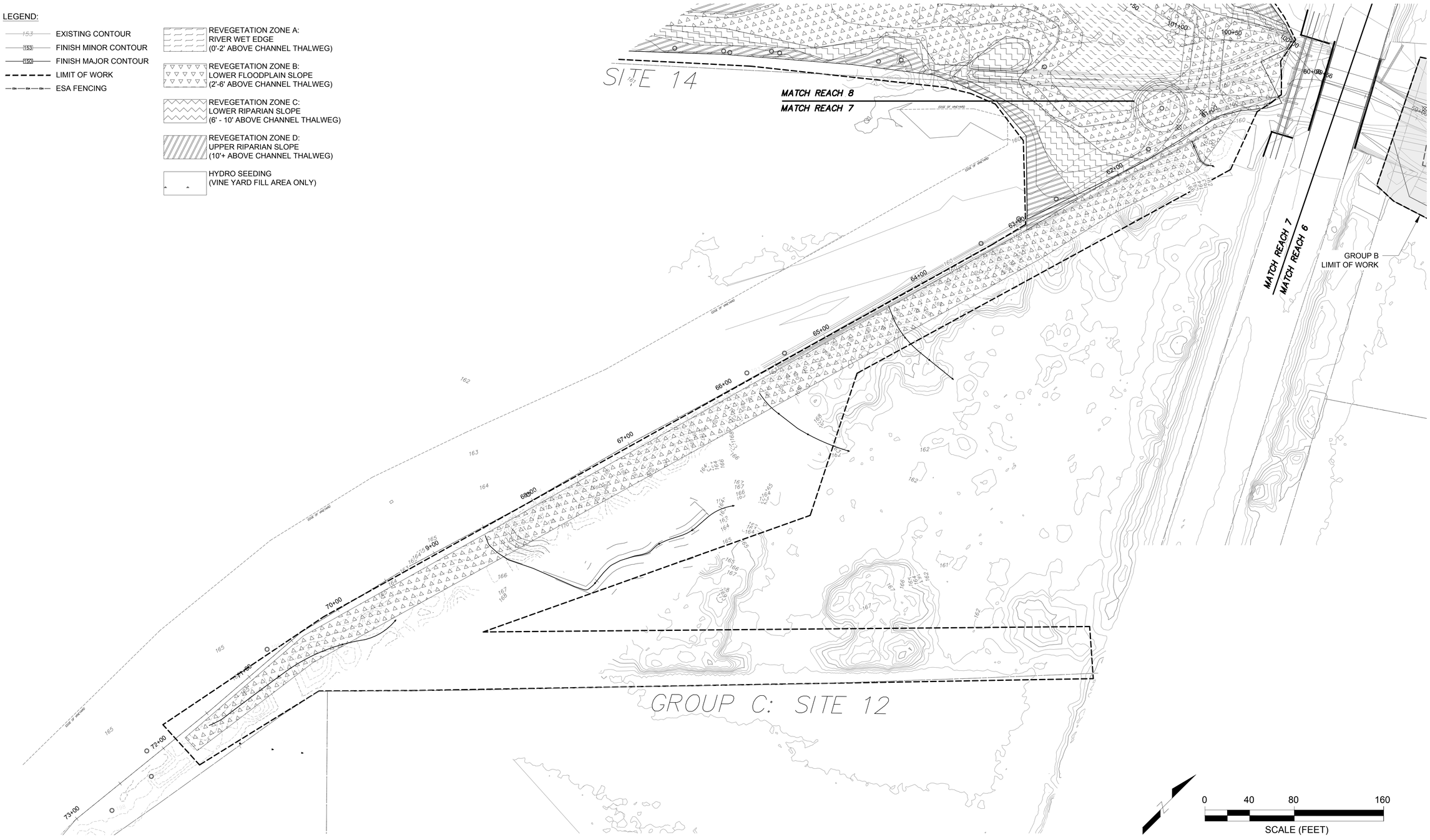
BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size: D | Project: 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 13 OF 15

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF WORK
- ESA FENCING

- REVEGETATION ZONE A: RIVER WET EDGE (0'-2' ABOVE CHANNEL THALWEG)
- REVEGETATION ZONE B: LOWER FLOODPLAIN SLOPE (2'-6' ABOVE CHANNEL THALWEG)
- REVEGETATION ZONE C: LOWER RIPARIAN SLOPE (6' - 10' ABOVE CHANNEL THALWEG)
- REVEGETATION ZONE D: UPPER RIPARIAN SLOPE (10'+ ABOVE CHANNEL THALWEG)
- HYDRO SEEDING (VINE YARD FILL AREA ONLY)



BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C

NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

PLANTING PLAN - REACH 7
60+00 TO 73+00

BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size: D | Project: 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 14 OF 14

LAST SAVED: 8/12/2021 PLOT DATE: 9/4/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB
\\AELIANUS\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C - PLANTING.DWG
IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF WORK
- ESA FENCING

- REVEGETATION ZONE A: RIVER WET EDGE (0'-2' ABOVE CHANNEL THALWEG
- REVEGETATION ZONE B: LOWER FLOODPLAIN SLOPE (2'-6' ABOVE CHANNEL THALWEG
- REVEGETATION ZONE C: LOWER RIPARIAN SLOPE (6' - 10' ABOVE CHANNEL THALWI
- REVEGETATION ZONE D: UPPER RIPARIAN SLOPE (10'+ ABOVE CHANNEL THALWEG
- HYDRO SEEDING (VINE YARD FILL AREA ONLY)

0 40 80 160

SCALE (FEET)

LIMIT OF WORK

GROUP C: SITE 13

STAGING AREA

GRADING LIMITS, TYP.

EQUIPMENT PAD, PIP

PIPE, PIP

MATCH REACH 8

MATCH REACH 6

GROUP B LIMIT OF WORK

GROUP C: SITE 14

MATCH REACH 9

MATCH REACH 8

MATCH REACH 8

MATCH REACH 7

EDGE OF VINEYARD

EDGE OF VINEYARD

EDGE OF VINEYARD

EDGE OF VINEYARD

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 9/4/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

I:\MELANIE\PROJECTS\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C – PLANTING.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil
Environmental
& Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

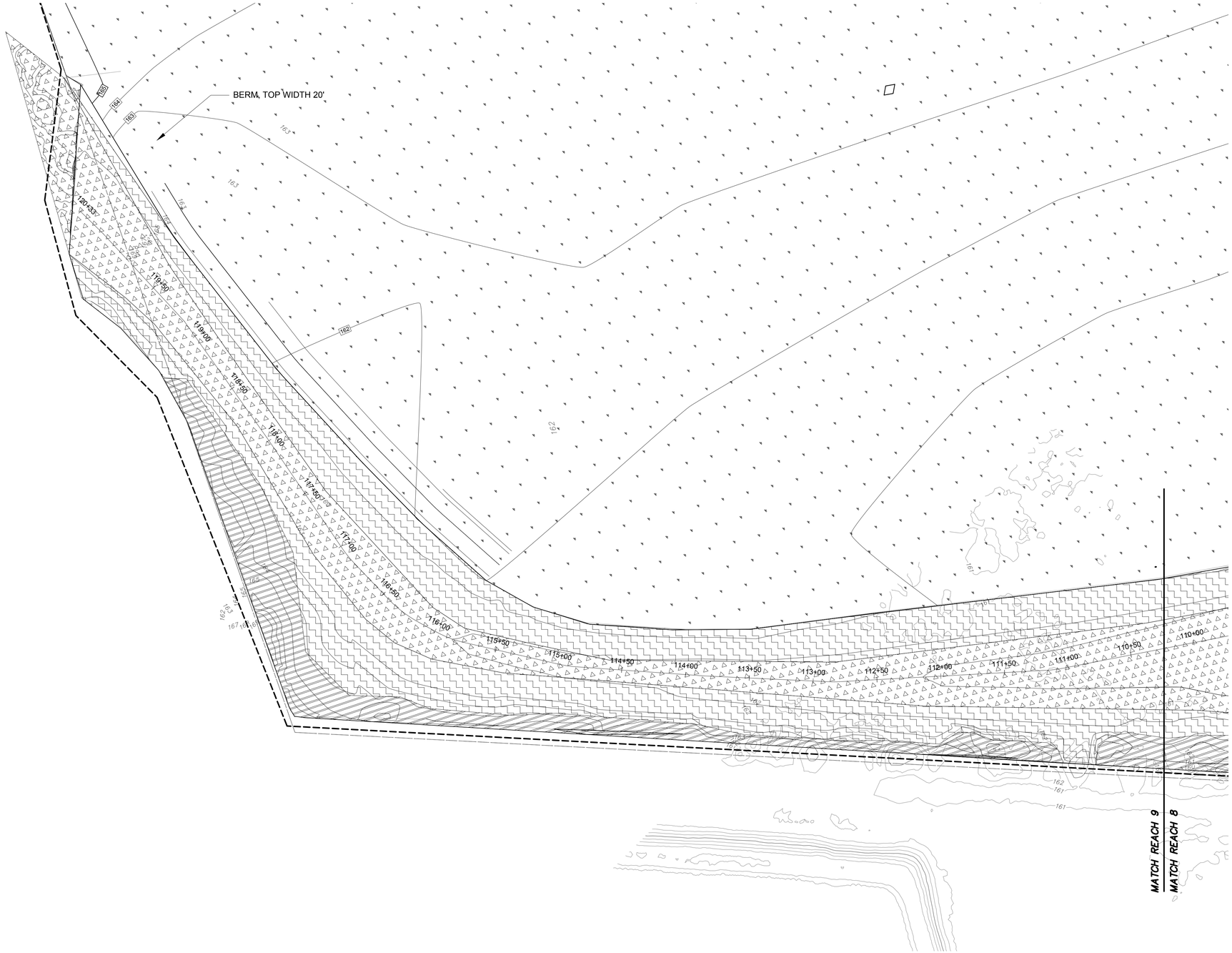
PLANTING PLAN - REACH 8
100+00 TO 110+50
BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 15 OF 14

LEGEND:

- 153 EXISTING CONTOUR
- 153 FINISH MINOR CONTOUR
- 150 FINISH MAJOR CONTOUR
- LIMIT OF WORK
- ESA FENCING

- REVEGETATION ZONE A: RIVER WET EDGE (0'-2' ABOVE CHANNEL THALWEG
- REVEGETATION ZONE B: LOWER FLOODPLAIN SLOPE (2'-6' ABOVE CHANNEL THALWEG
- REVEGETATION ZONE C: LOWER RIPARIAN SLOPE (6' - 10' ABOVE CHANNEL THALW
- REVEGETATION ZONE D: UPPER RIPARIAN SLOPE (10'+ ABOVE CHANNEL THALWEG
- HYDRO SEEDING (VINE YARD FILL AREA ONLY)



0 40 80 160 Feet

1:480.0011

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

PLANTING PLAN - REACH 9
110+50 TO 120+00
BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 16 OF 14

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

LAST SAVED: 8/12/2021 PLOT DATE: 9/4/2020 PLOT STYLE: QUESTA-GRAYSCALE-255.CTB

\\KELANUS\PROJECTZ\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C – PLANTING.DWG

LEGEND:

- EXISTING CONTOUR
- FINISH MINOR CONTOUR
- FINISH MAJOR CONTOUR
- LIMIT OF WORK
- ESA FENCING

- REVEGETATION ZONE A: RIVER WET EDGE (0'-2' ABOVE CHANNEL THALWEG
- REVEGETATION ZONE B: LOWER FLOODPLAIN SLOPE (2'-6' ABOVE CHANNEL THALWEG
- REVEGETATION ZONE C: LOWER RIPARIAN SLOPE (6' - 10' ABOVE CHANNEL THALW
- REVEGETATION ZONE D: UPPER RIPARIAN SLOPE (10'+ ABOVE CHANNEL THALWEG
- HYDRO SEEDING (VINE YARD FILL AREA ONLY)

GROUP C: FILL AREA

GROUP C: SITE

MATCH REACH B

MATCH REACH B

0 40 80 160 Feet

1:480.0011

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY

PLOT STYLE:QUESTA–GRAYSCALE–255.CTB

LAST SAVED: 8/12/2021 PLOT DATE: 9/4/2020

\\KELHANUV\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\GROUP C – PLANTING.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

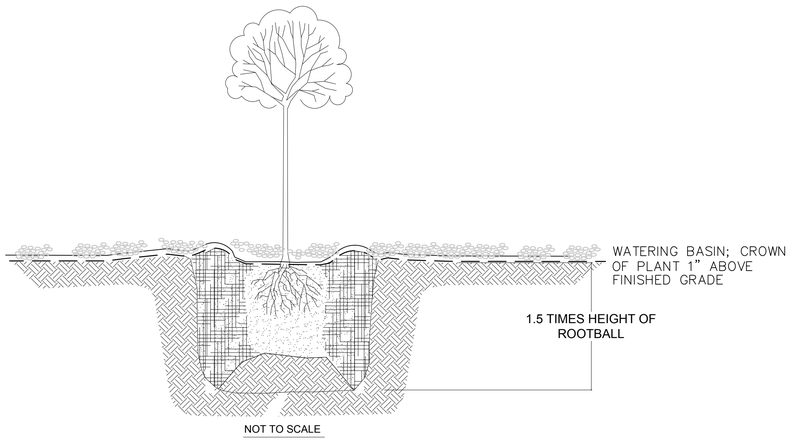
Sht:	Rev:	Date:	By:	Description:	App'd:

Design: OR
Drawn: OR
Checked: ST
Appr'd: ST

PLANTING PLAN - FILL AREA

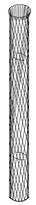
BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size: D | Project: 1900133
Scale: 1" = 40'
Date: 8/12/21
Sheet: 17 OF 14



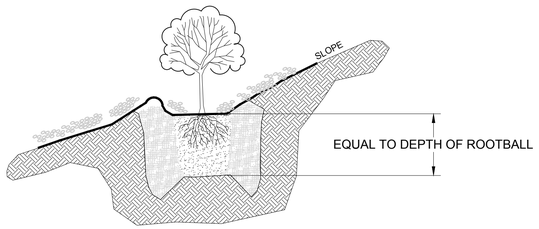
A TREE PLANTING

SCALE: N.T.S.



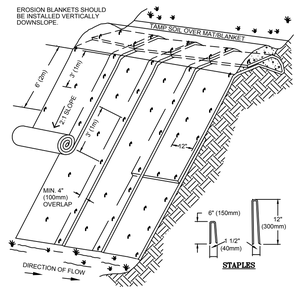
B RIGID SEEDLING PROTECTOR

SCALE: N.T.S.



C SHRUB PLANTING

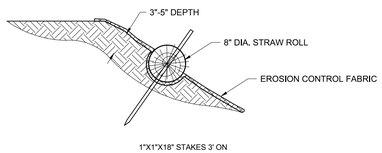
SCALE: N.T.S.



NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

D EROSION CONTROL FABRIC

SCALE: N.T.S.

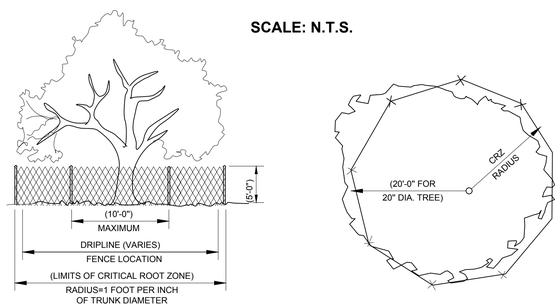


NOTE:

1. PLACE THE LOOSE EDGE OF THE STRAW WATTLES INTO A 4-INCH DEEP TRENCH AND SECURE WITH A SINGLE ROW OF STAPLES INSTALLED ON 12-INCH CENTERS. THEN PROCEED TO POSITION THE STRAW WATTLES INTO THE TRENCH ADJACENT TO THE SIDEWALK/BACK OF CURB/BACK OF V-DITCH.
2. DRIVE WOODEN 18-INCH STAKES THROUGH THE WATTLE ON APPROXIMATELY 3-FOOT CENTERS TO SECURE IN PLACE. CONSTRUCTION OF THE TRENCH AND PROPER STAPLE PLACEMENT IS NECESSARY TO PREVENT WATER AND SEDIMENT FROM FLOWING DIRECTLY UNDER THE SEDIMENT CONTROL WATTLE. WITH THIS TYPE OF INSTALLATION, WATER WILL ACCUMULATE BEHIND THE WATTLE, ALLOWING SEDIMENT LADEN WATER TO BE FILTERED THROUGH THE ROLL WHILE DEPOSITION OF SEDIMENT OCCURS BEHIND THE WATTLE.

E STRAW ROLL

SCALE: N.T.S.



F TREE PROTECTION FENCE

SCALE: N.T.S.

PLANTING LIST

Bale Slough Bear Creek Restoration Project - Planting Palette

RIPARIAN REVEGETATION CONTAINER PLANTINGS:

Container / Pole / Plug Plantings Acreage Total

Habitat Type: River Wet Edge (0'- 2' above channel thalweg)

	Biological Name / Common Name	Container	Quantity / ac	Spacing
Herbaceous	*Carex barbarae* / Santa Barbara Sedge	Super Stubby (L6)	2000	± 3' O.C.
	Carex praegracilis / California Field Sedge	Super Stubby (L6)	1000	
	Eleocharis macrostachya / Common Spike Rush	Super Stubby (L6)	500	
	Juncus balticus /Baltic Rush	Plug	1000	
	Juncus effusus var. brunneus / Common Rush	Super Stubby (L6)	500	

Habitat Type: Lower Floodplain Slope (2' - 6' above channel thalweg)

	Biological Name / Common Name	Container	Quantity / ac	Spacing
Trees	*Alnus rhombifolia* / White Alder	Treepot 4	65	± 10.5' O.C.
	Fraxinus latifolia / Oregon Ash	Treepot 4	30	
	Populus fremontii / Fremont's Cottonwood	Pole	20	
	Populus fremontii / Fremont's Cottonwood	Treepot 4	30	
	Salix laevigata / Red Willow	Pole	90	
	Salix lutea / Yellow Willow	Pole	40	
Shrubs	*Baccharis salicifolia* / Mule Fat	Deepot 40	20	± 20.0' O.C.
	Physocarpus capitatus/ Ninebark	1-Gallon	15	
	Rosa californica / California Wild Rose	1-Gallon	20	
	Symphoricarpos albus / Snowberry	1-Gallon	20	
Herbaceous	*Carex barbarae* / Santa Barbara Sedge	Super Stubby (L6)	1550	± 3' O.C.
	Carex praegracilis / California Field Sedge	Super Stubby (L6)	525	
	Eleocharis macrostachya / Common Spike Rush	Super Stubby (L6)	625	
	Elymus triticoides /Creeping Wildrye	Plug	1250	
	Euthamia occidentalis / Western Goldenrod	Liner	300	
	Juncus balticus /Baltic Rush	Plug	525	
	Juncus effusus var. brunneus / Pacific Rush	Super Stubby (L6)	525	
		Trees and Shrubs		
				Total

Habitat Type: Lower Riparian Slope (6' - 10' above channel thalweg)

	Biological Name / Common Name	Container	Quantity / ac	Spacing
Trees	*Alnus rhombifolia* / White Alder	Treepot 4	25	± 10' O.C.
	Fraxinus latifolia / Oregon Ash	Treepot 4	20	
	Populus fremontii / Fremont's Cottonwood	Pole	60	
	Populus fremontii / Fremont's Cottonwood	Treepot 4	30	
	Salix laevigata / Red Willow	Pole	80	
	Quercus agrifolia / Coast Live Oak	Treepot 4	15	
	Quercus lobata / Valley Oak	Treepot 4	20	
Shrubs	*Baccharis pilularis* / Coyote Bush	Deepot 40	30	± 15.5' O.C.
	Calycanthus occidentalis / Western Spice Bush	1-Gallon	20	
	Rosa californica / California Wild Rose	1-Gallon	20	
	Symphoricarpos albus / Snowberry	1-Gallon	60	
Herbaceous	*Carex barbarae* / Santa Barbara Sedge	Super Stubby (L6)	2000	± 3' O.C.
	Elymus triticoides /Creeping Wildrye	Plug	1500	
	Euthamia occidentalis / Western Goldenrod	Liner	500	
	Juncus balticus /Baltic Rush	Plug	500	
	Symphyotrichum chilense / Common Aster	Plug	500	
		Trees and Shrubs		
				Total

Habitat Type: Upper Riparian Slope (10' + above channel thalweg)

	Biological Name / Common Name	Container	Quantity / ac	Spacing
Trees	*Acer macrophyllum* / Big Leaf Maple	Treepot 4	20	± 13.5' O.C.
	Aesculus californica / California Buckeye	Treepot 4	20	
	Fraxinus latifolia / Oregon Ash	Treepot 4	15	
	Juglans californica / California Black Walnut	Treepot 4	30	
	Populus fremontii / Fremont's Cottonwood	Treepot 4	20	
	Salix laevigata / Red Willow	Pole	20	
	Quercus lobata / Valley Oak	Treepot 4	30	
	Quercus agrifolia / Coast Live Oak	Treepot 4	45	
	Umbellularia californica / Bay Laurel	Treepot 4	20	
Shrubs	*Achillea millefolium* / Yarrow	Deepot 40	35	± 13.0' O.C.
	Baccharis pilularis / Coyote Bush	Deepot 40	45	
	Calycanthus occidentalis / Western Spice Bush	1-Gallon	15	
	Heteromeles arbutifolia / Toyon	Treepot 4	15	
	Physocarpus capitatus/ Ninebark	1-Gallon	15	
	Ribes californicum/ California gooseberry	1-Gallon	15	
	Rosa californica / California Wild Rose	1-Gallon	55	
	Symphoricarpos albus / Snowberry	1-Gallon	50	
Vines	*Aristolochia californica*/ Pipe vine	1-Gallon	20	± 35.5' O.C.
	Lonicera hispidula / Honeysuckle	1-Gallon	15	
Herbaceous	*Bromus carinatus* / California Brome	Plug	325	± 3.5' O.C.
	Carex barbarae / Santa Barbara Sedge	Super Stubby (L6)	825	
	Elymus glaucus / Blue Wildrye	Plug	1050	
	Elymus triticoides /Creeping Wildrye	Plug	525	
	Festuca idahoensis / Idaho Fescue	Plug	525	
	Muhlenbergia rigens / Deergrass	1-Gallon	100	
	Symphyotrichum chilense / Common Aster	Plug	425	

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE – ADJUST ACCORDINGLY
LAST SAVED: 8/12/2021 PLOT DATE: 8/12/2021 PLOT STYLE: ----
\\ALAMO\S\PROJECT2\2019\1900133_NAPA_BEAR_CREEK\CAD\SHEETS\PLANTING DETAILS.DWG

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP C
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114
FAX (510) 236-2423
questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: ST
Drawn: KT/OR
Checked: ST
Appr'd: ST

PLANTING DETAILS

BALE SLOUGH - BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: NO SCALE
Date: 8/12/21
Sheet: 18 OF 15

Appendix B

Air Quality Calculations

Bale Slough Restoration - Construction Emissions **Update 7_4_21**

Pollutant: CO2

Project Group A (Year 2022)

									On- Site				Off-Site		Total		
EQUIPMENT	hp*	LoadFac*	CO2Fac*	Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis	
Excavator	158	0.38	472.1917	2	130	work days	8.00	hours/day	453606	58968811					453606	58968811	
Dozer	247	0.40	479.3107	2	130	work days	8.00	hours/day	757694	98500266					757694	98500266	
Loader	203	0.36	469.9041	2	130	work days	8.00	hours/day	549449	71428431					549449	71428431	
Backhoe	97	0.37	475.8975	2	130	work days	8.00	hours/day	273279	35526319					273279	35526319	
Roller	80	0.38	473.9291	1	130	work days	8.00	hours/day	115260	14983742					115260	14983742	
Water Truck	402	0.38	474.7136	1	130	work days	8.00	hours/day	580138	75417940					580138	75417940	
Haul Truck	1	1	0.0000	12	130	work days	1	day	0	0	1557.2239	60.0	1121201	145756161	1121201	145756161	27.7%
Pickup Truck				3	130	work days	1	trips/day	0	0	609.5807	80.0	146299	19018919	146299	19018919	
Worker Commute				15	130	work days	2	trips/day	0	0	271.7341	10.8	44021	5722720	44021	5722720	
		* Equipment: CalEEMod 2020.4 Appendix D				**Tot (grams)**			**2,729,427**	**354,825,509**			**1,311,522**	**170,497,800**	**4,040,949**	**525,323,308**	**525.3 MT**
		Haul Truck: EMFAC 2017 HHD Idle				**Tot (lbs)**			**6017.3**	**782248.3**			**2891.4**	**375879.4**	**8908.7**	**1158127.8**	**579.1 tons**
						Avg. Day (lbs)										**8908.7**	

Haul Truck: EMFAC2017 HHDT 35 mph
Pickup Truck: EMFAC2017 LDT2 10 mph
Worker Commute: EMFAC2017 LDT2 35 mph

Project Group B (Year 2023)

									On- Site				Off-Site		Total		
EQUIPMENT	hp*	LoadFac*	CO2Fac*	Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis	
Excavator	158	0.38	472.2770	2	130	work days	8.00	hours/day	453688	58979463					453688	58979463	
Dozer	247	0.40	479.4678	2	130	work days	8.00	hours/day	757943	98532551					757943	98532551	
Loader	203	0.36	469.8240	2	130	work days	8.00	hours/day	549356	71416255					549356	71416255	
Backhoe	97	0.37	476.4307	2	130	work days	8.00	hours/day	273586	35566123					273586	35566123	
Roller	80	0.38	473.9363	1	130	work days	8.00	hours/day	115261	14983970					115261	14983970	
Water Truck	402	0.38	475.0488	1	130	work days	8.00	hours/day	580548	75471193					580548	75471193	
Haul Truck	1	1	0.0000	12	130	work days	1	day	0	0	1426.7068	60.0	1027229	133539758	1027229	133539758	26.0%
Pickup Truck				3	130	work days	1	trips/day	0	0	595.1222	80.0	142829	18567812	142829	18567812	
Worker Commute				15	130	work days	2	trips/day	0	0	265.2889	10.8	42977	5586984	42977	5586984	
		* Equipment: CalEEMod 2020.4 Appendix D				**Tot (grams)**			**2,730,381**	**354,949,555**			**1,213,035**	**157,694,554**	**3,943,416**	**512,644,109**	**512.6 MT**
		Haul Truck: EMFAC 2017 HHD Idle				**Tot (lbs)**			**6019.4**	**782521.8**			**2674.3**	**347653.4**	**8693.7**	**1130175.2**	**565.1 tons**
						Avg. Day (lbs)										**8693.7**	

Haul Truck: EMFAC2017 HHDT 35 mph
Pickup Truck: EMFAC2017 LDT2 10 mph
Worker Commute: EMFAC2017 LDT2 35 mph

Project Group C (Year 2024)

									On- Site				Off-Site		Total		
EQUIPMENT	hp*	LoadFac*	CO2Fac*	Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis	
Excavator	158	0.38	472.4279	1	130	work days	8.00	hours/day	226917	29499154					226917	29499154	
Scraper	367	0.48	472.8455	3	130	work days	8.00	hours/day	1999115	259884965					1999115	259884965	
Dozer	247	0.40	479.3938	2	130	work days	8.00	hours/day	757826	98517343					757826	98517343	
Loader	203	0.36	469.7875	2	130	work days	8.00	hours/day	549313	71410707					549313	71410707	
Backhoe	97	0.37	476.7313	2	130	work days	8.00	hours/day	273758	35588564					273758	35588564	
Roller	80	0.38	474.0072	1	130	work days	8.00	hours/day	115279	14986212					115279	14986212	
Water Truck	402	0.38	475.2203	1	130	work days	8.00	hours/day	580757	75498439					580757	75498439	
Haul Truck	1	1	0.0000	0	130	work days	1	day	0	0	1401.6656	60.0	0	0	0	0	
Pickup Truck				3	130	work days	1	trips/day	0	0	580.2184	80.0	139252	18102813	139252	18102813	
Worker Commute				15	130	work days	2	trips/day	0	0	258.6452	10.8	41901	5447067	41901	5447067	
		* Equipment: CalEEMod 2020.4 Appendix D				**Tot (grams)**			**4,502,964**	**585,385,384**			**181,153**	**23,549,880**	**4,684,117**	**608,935,264**	**608.9 MT**
		Haul Truck: EMFAC 2017 HHD Idle				**Tot (lbs)**			**9927.2**	**1290540.6**			**399.4**	**51918.1**	**10326.6**	**1342458.7**	**671.2 tons**
						Avg. Day (lbs)										**10326.6**	

Haul Truck: EMFAC2017 HHDT 35 mph
Pickup Truck: EMFAC2017 LDT2 10 mph
Worker Commute: EMFAC2017 LDT2 35 mph

Bale Slough Restoration - Construction Emissions

Update 7_4_21

Pollutant: NOx

Project Group A (Year 2022)

										On- Site		Off-Site			Total		
EQUIPMENT	hp*	LoadFac*	NOxFac*		Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis
Excavator	158	0.38	1.6781		2	130	work days	8.00	hours/day	1612	209566					1612	209566
Dozer	247	0.40	4.8078		2	130	work days	8.00	hours/day	7600	988012					7600	988012
Loader	203	0.36	2.3469		2	130	work days	8.00	hours/day	2744	356748					2744	356748
Backhoe	97	0.37	2.6472		2	130	work days	8.00	hours/day	1520	197615					1520	197615
Roller	80	0.38	3.2190		1	130	work days	8.00	hours/day	783	101771					783	101771
Water Truck	402	0.38	1.4898		1	130	work days	8.00	hours/day	1821	236677					1821	236677
Haul Truck	1	1	58.2583		12	130	work days	1	day	87	11360	4.3586	60.0	3138	407961	3226	419322
Pickup Truck					3	130	work days	1	trips/day	0	0	0.1439	80.0	35	4491	35	4491
Worker Commute					15	130	work days	2	trips/day	0	0	0.0564	10.8	9	1188	9	1188

16.7%

* Equipment: CalEEMod 2020.4 Appendix D

Haul Truck: EMFAC 2017 HHD Idle

Tot (grams)	16,167	2,101,750			3,182	413,641	19,349	2,515,391
Tot (lbs)	35.6	4633.5			7.0	911.9	42.7	5545.4
Avg. Day (lbs)								42.7

2.77 tons

Haul Truck: EMFAC2017 HHDT 35 mph

Pickup Truck: EMFAC2017 LDT2 10 mph

Worker Commute: EMFAC2017 LDT2 35 mph

Project Group B (Year 2023)

										On- Site		Off-Site			Total		
EQUIPMENT	hp*	LoadFac*	NOxFac*		Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis
Excavator	158	0.38	1.4625		2	130	work days	8.00	hours/day	1405	182635					1405	182635
Dozer	247	0.40	4.4084		2	130	work days	8.00	hours/day	6969	905934					6969	905934
Loader	203	0.36	2.0596		2	130	work days	8.00	hours/day	2408	313077					2408	313077
Backhoe	97	0.37	2.4261		2	130	work days	8.00	hours/day	1393	181109					1393	181109
Roller	80	0.38	3.0030		1	130	work days	8.00	hours/day	730	94943					730	94943
Water Truck	402	0.38	1.3243		1	130	work days	8.00	hours/day	1618	210389					1618	210389
Haul Truck	1	1	53.2852		12	130	work days	1	day	80	10391	3.1221	60.0	2248	292227	2328	302618
Pickup Truck					3	130	work days	1	trips/day	0	0	0.1410	80.0	34	4400	34	4400
Worker Commute					15	130	work days	2	trips/day	0	0	0.0518	10.8	8	1090	8	1090

13.8%

* Equipment: CalEEMod 2020.4 Appendix D

Haul Truck: EMFAC 2017 HHD Idle

Tot (grams)	14,604	1,898,478			2,290	297,718	16,894	2,196,195
Tot (lbs)	32.2	4185.4			5.0	656.3	37.2	4841.7
Avg. Day (lbs)								37.2

2.42 tons

Haul Truck: EMFAC2017 HHDT 35 mph

Pickup Truck: EMFAC2017 LDT2 10 mph

Worker Commute: EMFAC2017 LDT2 35 mph

Project Group C (Year 2024)

										On- Site		Off-Site			Total		
EQUIPMENT	hp*	LoadFac*	NOxFac*		Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis
Excavator	158	0.38	1.3248		1	130	work days	8.00	hours/day	636	82722					636	82722
Scraper	367	0.48	2.4769		3	130	work days	8.00	hours/day	10472	1361374					10472	1361374
Dozer	247	0.40	4.0305		2	130	work days	8.00	hours/day	6371	828276					6371	828276
Loader	203	0.36	1.8060		2	130	work days	8.00	hours/day	2112	274521					2112	274521
Backhoe	97	0.37	2.2880		2	130	work days	8.00	hours/day	1314	170798					1314	170798
Roller	80	0.38	2.8430		1	130	work days	8.00	hours/day	691	89884					691	89884
Water Truck	402	0.38	1.2352		1	130	work days	8.00	hours/day	1509	196234					1509	196234
Haul Truck	1	1	52.8071		0	130	work days	1	day	0	0	3.0842	60.0	0	0	0	0
Pickup Truck					3	130	work days	1	trips/day	0	0	0.1386	80.0	33	4326	33	4326
Worker Commute					15	130	work days	2	trips/day	0	0	0.0479	10.8	8	1009	8	1009

0.0%

* Equipment: CalEEMod 2020.4 Appendix D

Haul Truck: EMFAC 2017 HHD Idle

Tot (grams)	23,106	3,003,808			41	5,335	23,147	3,009,143
Tot (lbs)	50.9	6622.2			0.1	11.8	51.0	6634.0
Avg. Day (lbs)								51.0

3.32 tons

Haul Truck: EMFAC2017 HHDT 35 mph

Pickup Truck: EMFAC2017 LDT2 10 mph

Worker Commute: EMFAC2017 LDT2 35 mph

Bale Slough Restoration - Construction Emissions

Update 7_4_21

Pollutant: PM10

Project Group A (Year 2022)

										On- Site		Off-Site				Total		
EQUIPMENT	hp*	LoadFac*	PM10Fac*		Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis	
Excavator	158	0.38	0.0810		2	130	work days	8.00	hours/day	78	10116					78	10116	
Dozer	247	0.40	0.2200		2	130	work days	8.00	hours/day	348	45211					348	45211	
Loader	203	0.36	0.0790		2	130	work days	8.00	hours/day	92	12009					92	12009	
Backhoe	97	0.37	0.1420		2	130	work days	8.00	hours/day	82	10600					82	10600	
Roller	80	0.38	0.1860		1	130	work days	8.00	hours/day	45	5881					45	5881	
Water Truck	402	0.38	0.0540		1	130	work days	8.00	hours/day	66	8579					66	8579	
Haul Truck	1	1	0.0000		12	130	work days	1	day	0	0	0.0231	60.0	17	2167	17	2167	2.3%
Pickup Truck					3	130	work days	1	trips/day	0	0	0.0126	80.0	3	395	3	395	
Worker Commute					15	130	work days	2	trips/day	0	0	0.0056	10.8	1	118	1	118	
	* Equipment: CalEEMod 2020.4 Appendix D						**Tot (grams)**			**711**	**92,395**			**21**	**2,679**	**731**	**95,074**	
	Haul Truck: EMFAC 2017 HHD Idle						**Tot (lbs)**			**1.6**	**203.7**			**0.0**	**5.9**	**1.6**	**209.6**	**0.10 tons**
							Avg. Day (lbs)					Haul Truck: EMFAC2017 HHDT 35 mph					**1.6**	
												Pickup Truck: EMFAC2017 LDT2 10 mph						
												Worker Commute: EMFAC2017 LDT2 35 mph						

Project Group B (Year 2023)

										On- Site		Off-Site				Total		
EQUIPMENT	hp*	LoadFac*	PM10Fac*		Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis	
Excavator	158	0.38	0.0720		2	130	work days	8.00	hours/day	69	8992					69	8992	
Dozer	247	0.40	0.2020		2	130	work days	8.00	hours/day	319	41512					319	41512	
Loader	203	0.36	0.0690		2	130	work days	8.00	hours/day	81	10488					81	10488	
Backhoe	97	0.37	0.1200		2	130	work days	8.00	hours/day	69	8958					69	8958	
Roller	80	0.38	0.1650		1	130	work days	8.00	hours/day	40	5217					40	5217	
Water Truck	402	0.38	0.0480		1	130	work days	8.00	hours/day	59	7626					59	7626	
Haul Truck	1	1	0.0000		12	130	work days	1	day	0	0	0.0105	60.0	8	983	8	983	1.2%
Pickup Truck					3	130	work days	1	trips/day	0	0	0.0121	80.0	3	376	3	376	
Worker Commute					15	130	work days	2	trips/day	0	0	0.0054	10.8	1	115	1	115	
	* Equipment: CalEEMod 2020.4 Appendix D						**Tot (grams)**			**637**	**82,792**			**11**	**1,474**	**648**	**84,267**	
	Haul Truck: EMFAC 2017 HHD Idle						**Tot (lbs)**			**1.4**	**182.5**			**0.0**	**3.2**	**1.4**	**185.8**	**0.09 tons**
							Avg. Day (lbs)					Haul Truck: EMFAC2017 HHDT 35 mph					**1.4**	
												Pickup Truck: EMFAC2017 LDT2 10 mph						
												Worker Commute: EMFAC2017 LDT2 35 mph						

Project Group C (Year 2024)

										On- Site		Off-Site				Total		
EQUIPMENT	hp*	LoadFac*	PM10Fac*		Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis	
Excavator	158	0.38	0.0650		1	130	work days	8.00	hours/day	31	4059					31	4059	
Scraper	367	0.48	0.0980		3	130	work days	8.00	hours/day	414	53863					414	53863	
Dozer	247	0.40	0.1820		2	130	work days	8.00	hours/day	288	37402					288	37402	
Loader	203	0.36	0.0600		2	130	work days	8.00	hours/day	70	9120					70	9120	
Backhoe	97	0.37	0.1050		2	130	work days	8.00	hours/day	60	7838					60	7838	
Roller	80	0.38	0.1500		1	130	work days	8.00	hours/day	36	4742					36	4742	
Water Truck	402	0.38	0.0440		1	130	work days	8.00	hours/day	54	6990					54	6990	
Haul Truck	1	1	0.0000		0	130	work days	1	day	0	0	0.0104	60.0	0	0	0	0	
Pickup Truck					3	130	work days	1	trips/day	0	0	0.0116	80.0	3	362	3	362	
Worker Commute					15	130	work days	2	trips/day	0	0	0.0053	10.8	1	112	1	112	
	* Equipment: CalEEMod 2020.4 Appendix D						**Tot (grams)**			**954**	**124,015**			**4**	**474**	**958**	**124,489**	
	Haul Truck: EMFAC 2017 HHD Idle						**Tot (lbs)**			**2.1**	**273.4**			**0.0**	**1.0**	**2.1**	**274.4**	**0.14 tons**
							Avg. Day (lbs)					Haul Truck: EMFAC2017 HHDT 35 mph					**2.1**	
												Pickup Truck: EMFAC2017 LDT2 10 mph						
												Worker Commute: EMFAC2017 LDT2 35 mph						

Bale Slough Restoration - Construction Emissions

Update 7_4_21

Pollutant: PM25

Project Group A (Year 2022)

										On- Site		Off-Site				Total		
EQUIPMENT	hp*	LoadFac*	PM25Fac*		Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis	
Excavator	158	0.38	0.0750		2	130	work days	8.00	hours/day	72	9366					72	9366	
Dozer	247	0.40	0.2020		2	130	work days	8.00	hours/day	319	41512					319	41512	
Loader	203	0.36	0.0720		2	130	work days	8.00	hours/day	84	10944					84	10944	
Backhoe	97	0.37	0.1310		2	130	work days	8.00	hours/day	75	9779					75	9779	
Roller	80	0.38	0.1710		1	130	work days	8.00	hours/day	42	5406					42	5406	
Water Truck	402	0.38	0.0500		1	130	work days	8.00	hours/day	61	7944					61	7944	
Haul Truck	1	1	0.0000		12	130	work days	1	day	0	0	0.0221	60.0	16	2073	16	2073	2.4%
Pickup Truck					3	130	work days	1	trips/day	0	0	0.0121	80.0	3	378	3	378	
Worker Commute					15	130	work days	2	trips/day	0	0	0.0054	10.8	1	113	1	113	
	* Equipment: CalEEMod 2020.4 Appendix D						**Tot (grams)**			**653**	**84,952**			**20**	**2,563**	**673**	**87,515**	
	Haul Truck: EMFAC 2017 HHD Idle						**Tot (lbs)**			**1.4**	**187.3**			**0.0**	**5.7**	**1.5**	**192.9**	**0.10 tons**
							Avg. Day (lbs)										**1.5**	

Haul Truck: EMFAC2017 HHDT 35 mph
Pickup Truck: EMFAC2017 LDT2 10 mph
Worker Commute: EMFAC2017 LDT2 35 mph

Project Group B (Year 2023)

										On- Site		Off-Site				Total		
EQUIPMENT	hp*	LoadFac*	PM25Fac*		Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis	
Excavator	158	0.38	0.0660		2	130	work days	8.00	hours/day	63	8242					63	8242	
Dozer	247	0.40	0.1850		2	130	work days	8.00	hours/day	292	38018					292	38018	
Loader	203	0.36	0.0630		2	130	work days	8.00	hours/day	74	9576					74	9576	
Backhoe	97	0.37	0.1100		2	130	work days	8.00	hours/day	63	8212					63	8212	
Roller	80	0.38	0.1520		1	130	work days	8.00	hours/day	37	4806					37	4806	
Water Truck	402	0.38	0.0440		1	130	work days	8.00	hours/day	54	6990					54	6990	
Haul Truck	1	1	0.0000		12	130	work days	1	day	0	0	0.0101	60.0	7	941	7	941	1.2%
Pickup Truck					3	130	work days	1	trips/day	0	0	0.0115	80.0	3	360	3	360	
Worker Commute					15	130	work days	2	trips/day	0	0	0.0052	10.8	1	110	1	110	
	* Equipment: CalEEMod 2020.4 Appendix D						**Tot (grams)**			**583**	**75,844**			**11**	**1,410**	**594**	**77,255**	
	Haul Truck: EMFAC 2017 HHD Idle						**Tot (lbs)**			**1.3**	**167.2**			**0.0**	**3.1**	**1.3**	**170.3**	**0.09 tons**
							Avg. Day (lbs)										**1.3**	

Haul Truck: EMFAC2017 HHDT 35 mph
Pickup Truck: EMFAC2017 LDT2 10 mph
Worker Commute: EMFAC2017 LDT2 35 mph

Project Group C (Year 2024)

										On- Site		Off-Site				Total		
EQUIPMENT	hp*	LoadFac*	PM25Fac*		Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis	
Excavator	158	0.38	0.0600		1	130	work days	8.00	hours/day	29	3746					29	3746	
Scraper	367	0.48	0.0900		3	130	work days	8.00	hours/day	381	49466					381	49466	
Dozer	247	0.40	0.1680		2	130	work days	8.00	hours/day	266	34525					266	34525	
Loader	203	0.36	0.0560		2	130	work days	8.00	hours/day	65	8512					65	8512	
Backhoe	97	0.37	0.0970		2	130	work days	8.00	hours/day	56	7241					56	7241	
Roller	80	0.38	0.1380		1	130	work days	8.00	hours/day	34	4363					34	4363	
Water Truck	402	0.38	0.0410		1	130	work days	8.00	hours/day	50	6514					50	6514	
Haul Truck	1	1	0.0000		0	130	work days	1	day	0	0	0.0100	60.0	0	0	0	0	
Pickup Truck					3	130	work days	1	trips/day	0	0	0.0111	80.0	3	347	3	347	
Worker Commute					15	130	work days	2	trips/day	0	0	0.0051	10.8	1	107	1	107	
	* Equipment: CalEEMod 2020.4 Appendix D						**Tot (grams)**			**880**	**114,367**			**3**	**454**	**883**	**114,821**	
	Haul Truck: EMFAC 2017 HHD Idle						**Tot (lbs)**			**1.9**	**252.1**			**0.0**	**1.0**	**1.9**	**253.1**	**0.13 tons**
							Avg. Day (lbs)										**1.9**	

Haul Truck: EMFAC2017 HHDT 35 mph
Pickup Truck: EMFAC2017 LDT2 10 mph
Worker Commute: EMFAC2017 LDT2 35 mph

Bale Slough Restoration - Construction Emissions **Update 7_4_21**

Pollutant: ROG

Project Group A (Year 2022)

										On- Site		Off-Site				Total		
EQUIPMENT	hp*	LoadFac*	ROGFac*		Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis	
Excavator	158	0.38	0.1910		2	130	work days	8.00	hours/day	183	23853					183	23853	
Dozer	247	0.40	0.4750		2	130	work days	8.00	hours/day	751	97614					751	97614	
Loader	203	0.36	0.2260		2	130	work days	8.00	hours/day	264	34353					264	34353	
Backhoe	97	0.37	0.2600		2	130	work days	8.00	hours/day	149	19409					149	19409	
Roller	80	0.38	0.3100		1	130	work days	8.00	hours/day	75	9801					75	9801	
Water Truck	402	0.38	0.1960		1	130	work days	8.00	hours/day	240	31139					240	31139	
Haul Truck	1	1	0.0000		12	130	work days	1	day	0	0	0.0893	60.0	64	8362	64	8362	3.6%
Pickup Truck					3	130	work days	1	trips/day	0	0	0.1964	80.0	47	6126	47	6126	
Worker Commute					15	130	work days	2	trips/day	0	0	0.0151	10.8	2	317	2	317	
		* Equipment: CalEEMod 2020.4 Appendix D					**Tot (grams)**			**1,663**	**216,169**			**114**	**14,805**	**1,777**	**230,975**	
		Haul Truck: EMFAC 2017 HHD Idle					**Tot (lbs)**			**3.7**	**476.6**			**0.3**	**32.6**	**3.9**	**509.2**	**0.25 tons**
							Avg. Day (lbs)					Haul Truck: EMFAC2017 HHDT 35 mph					**3.9**	
												Pickup Truck: EMFAC2017 LDT2 10 mph						
												Worker Commute: EMFAC2017 LDT2 35 mph						

Project Group B (Year 2023)

										On- Site		Off-Site				Total		
EQUIPMENT	hp*	LoadFac*	ROGFac*		Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis	
Excavator	158	0.38	0.1780		2	130	work days	8.00	hours/day	171	22229					171	22229	
Dozer	247	0.40	0.4470		2	130	work days	8.00	hours/day	707	91860					707	91860	
Loader	203	0.36	0.2100		2	130	work days	8.00	hours/day	246	31921					246	31921	
Backhoe	97	0.37	0.2390		2	130	work days	8.00	hours/day	137	17842					137	17842	
Roller	80	0.38	0.2870		1	130	work days	8.00	hours/day	70	9074					70	9074	
Water Truck	402	0.38	0.1870		1	130	work days	8.00	hours/day	229	29709					229	29709	
Haul Truck	1	1	0.0000		12	130	work days	1	day	0	0	0.0191	60.0	14	1785	14	1785	0.8%
Pickup Truck					3	130	work days	1	trips/day	0	0	0.1971	80.0	47	6150	47	6150	
Worker Commute					15	130	work days	2	trips/day	0	0	0.0148	10.8	2	312	2	312	
		* Equipment: CalEEMod 2020.4 Appendix D					**Tot (grams)**			**1,559**	**202,635**			**63**	**8,247**	**1,622**	**210,882**	
		Haul Truck: EMFAC 2017 HHD Idle					**Tot (lbs)**			**3.4**	**446.7**			**0.1**	**18.2**	**3.6**	**464.9**	**0.23 tons**
							Avg. Day (lbs)					Haul Truck: EMFAC2017 HHDT 35 mph					**3.6**	
												Pickup Truck: EMFAC2017 LDT2 10 mph						
												Worker Commute: EMFAC2017 LDT2 35 mph						

Project Group C (Year 2024)

										On- Site		Off-Site				Total		
EQUIPMENT	hp*	LoadFac*	ROGFac*		Quantity	T DURATION	UNIT	D DURATION	UNIT	DayEmis	TotEmis	Emfac	Length	DayEmis	TotEmis	DayEmis	TotEmis	
Excavator	158	0.38	0.1700		1	130	work days	8.00	hours/day	82	10615					82	10615	
Scraper	367	0.48	0.2450		3	130	work days	8.00	hours/day	1036	134657					1036	134657	
Dozer	247	0.40	0.4170		2	130	work days	8.00	hours/day	659	85695					659	85695	
Loader	203	0.36	0.1970		2	130	work days	8.00	hours/day	230	29945					230	29945	
Backhoe	97	0.37	0.2270		2	130	work days	8.00	hours/day	130	16946					130	16946	
Roller	80	0.38	0.2720		1	130	work days	8.00	hours/day	66	8600					66	8600	
Water Truck	402	0.38	0.1840		1	130	work days	8.00	hours/day	225	29232					225	29232	
Haul Truck	1	1	0.0000		0	130	work days	1	day	0	0	0.0190	60.0	0	0	0	0	0.0%
Pickup Truck					3	130	work days	1	trips/day	0	0	0.1978	80.0	47	6172	47	6172	
Worker Commute					15	130	work days	2	trips/day	0	0	0.0147	10.8	2	309	2	309	
		* Equipment: CalEEMod 2020.4 Appendix D					**Tot (grams)**			**2,428**	**315,690**			**50**	**6,481**	**2,478**	**322,171**	
		Haul Truck: EMFAC 2017 HHD Idle					**Tot (lbs)**			**5.4**	**696.0**			**0.1**	**14.3**	**5.5**	**710.3**	**0.36 tons**
							Avg. Day (lbs)					Haul Truck: EMFAC2017 HHDT 35 mph					**5.5**	
												Pickup Truck: EMFAC2017 LDT2 10 mph						
												Worker Commute: EMFAC2017 LDT2 35 mph						

Group A Construction-Related Emissions (lbs/day)

Emission Source	ROG	NOx	Exhaust PM10	Exhaust PM 2.5
Off-Road Construction Equipment	3.67	35.45	1.57	1.44
Haul Trucks	0.14	7.11	0.04	0.04
Pickup Trucks	0.10	0.08	0.01	0.01
Worker Commute Vehicles	0.01	0.02	0.00	0.00
Total	**3.92**	**42.66**	**1.61**	**1.48**
BAAQMD Construction Threshold	**54**	**54**	**82**	**54**
Significant Impact?	**No**	**No**	**No**	**No**

Appendix D to the User's Guide of CalEEMod (Version 2020.4.0) lists all the numerical values in the model database used to calculate development project criteria pollutant emissions. Diesel-powered construction equipment emission factors from the OFFROAD model and on-road motor vehicle emission rates from EMFAC2017 (the CARB's EPA-approved motor vehicle emission model) for haul trucks, pickup trucks and worker commute vehicles were used along with project-specific equipment type/number and truck/worker commute trips to estimate project construction emissions by Excel spreadsheet.

Group B Construction-Related Emissions (lbs/day)

Emission Source	ROG	NOx	Exhaust PM10	Exhaust PM 2.5
Off-Road Construction Equipment	3.44	32.02	1.40	1.29
Haul Trucks	0.03	5.13	0.02	0.02
Pickup Trucks	0.10	0.07	0.01	0.01
Worker Commute Vehicles	0.01	0.02	0.00	0.00
Total	**3.58**	**37.24**	**1.43**	**1.31**
BAAQMD Construction Threshold	**54**	**54**	**82**	**54**
Significant Impact?	**No**	**No**	**No**	**No**

Appendix D to the User's Guide of CalEEMod (Version 2020.4.0) lists all the numerical values in the model database used to calculate development project criteria pollutant emissions. Diesel-powered construction equipment emission factors from the OFFROAD model and on-road motor vehicle emission rates from EMFAC2017 (the CARB's EPA-approved motor vehicle emission model) for haul trucks, pickup trucks and worker commute vehicles were used along with project-specific equipment type/number and truck/worker commute trips to estimate project construction emissions by Excel spreadsheet.

Group C Construction-Related Emissions (lbs/day)

Emission Source	ROG	NOx	Exhaust PM10	Exhaust PM 2.5
Off-Road Construction Equipment	5.35	50.94	2.10	1.94
Haul Trucks	0.00	0.00	0.00	0.00
Pickup Trucks	0.10	0.07	0.01	0.01
Worker Commute Vehicles	0.01	0.02	0.00	0.00
Total	**5.46**	**51.03**	**2.11**	**1.95**
BAAQMD Construction Threshold	**54**	**54**	**82**	**54**
Significant Impact?	**No**	**No**	**No**	**No**

Appendix D to the User's Guide of CalEEMod (Version 2020.4.0) lists all the numerical values in the model database used to calculate development project criteria pollutant emissions. Diesel-powered construction equipment emission factors from the OFFROAD model and on-road motor vehicle emission rates from EMFAC2017 (the CARB's EPA-approved motor vehicle emission model) for haul trucks, pickup trucks and worker commute vehicles were used along with project-specific equipment type/number and truck/worker commute trips to estimate project construction emissions by Excel spreadsheet.

Bale Slough - HEALTH RISK/PM CONCENTRATION SCREENING MODEL

Model Source Area	Area (acres)	Area (sq ft)	Area (sq m)	Long Side (feet)	Short Side (feet)	Long Side (meters)	Short Side (meters)
Group A (Year 2022)	**2.41**	105,000	9,755	**3000**	**35**	914.4	10.7
Group B (Year 2023)	**2.41**	105,000	9,755	**3000**	**35**	914.4	10.7
Group C (Year 2024)	**55.10**	2,400,000	222,967	**2000**	**1200**	609.6	365.8
	0.0	0	0			0.0	0.0
	0.0	0	0			0.0	0.0
	0.0	0	0			0.0	0.0
	59.92	**2,610,000**	**242,477**				

Cumulative Analysis

	CR	CHI	PM2.5
Stationary (Sum)	1.00	0.0000	0.6600
	1.00	0.00	0.66
Proj Construct w/o Mit	**1.00**	**0.00**	**0.66**
Proj Construct w Mit			

SCREEN3 Model						Average Daily							**DPM**	
California Average	Total DPM	Total	Daily DPM	Hours/	Seconds/	Emission	Emission		Receptor		DPM Conc	**Annual**	
Construction Fleet	Emissions	Days	Emissions	Day	Day	Rate	Rate/Area		Distance	Chi/Q	Avg Hour	**Conc**	
Contributing Model Area	(grams)		(grams)			(g/sec)	(g/sec*m2)		(feet)	SCREEN3	ug/m3	**ug/m3**	**CHI**
Group A (Year 2022)	**9,911**	365	27.15	24	86,400	3.14E-04	3.22E-08			**1.55E+07**	0.4987	**0.0499**	**0.0100**
Group B (Year 2023)	**8,849**	365	24.24	24	86,400	2.81E-04	2.88E-08			**1.55E+07**	0.4453	**0.0445**	**0.0089**
Group C (Year 2024)	**114,367**	365	313.33	24	86,400	3.63E-03	1.63E-08			**7.76E+07**	1.2618	**0.1262**	**0.0252**

	Dose Factors							**Risk Factors**				
	Air Conc	DBR	EF	ED	CF	AT	**Dose**	Cancer Potency Factor	Age	**Cancer**	**BAAQMD**
Affected Receptor	(ug/m3)	(L /kg day)	(days/yr)	(years)		(days)	mg/kg day	(mg/kg day)^-1	Sens. Fac.	**Risk**	**Threshold**
Highest Existing Sensitive	0.0499	302	350	1.00	1.00E+00	25550	2.06E-01	1.10	1.7	**0.39**	**10**
Highest Existing Sensitive	0.0445	302	350	1.00	1.00E+00	25550	1.84E-01	1.10	1.7	**0.34**	**10**
Highest Existing Sensitive	0.1262	302	350	1.00	1.00E+00	25550	5.22E-01	1.10	1.7	**0.98**	**10**

Table 3: Maximum Project and Cumulative TAC Impacts on Sensitive Receptors in the Project Site Vicinity

BAAQMD Source ID	Facility	Address	Cancer Risk	Chronic Hazard Index	$PM_{2.5}$ Concentration
From Local Permitted Stationary TAC Sources*					
6380	Upper Valley Disposal Service, Inc.	1285 Whitehall Lane, St. Helena	0	0	0.18**
21263	Private Residence	999 Rutherford Cross Road, Rutherford	0	0	0
22901	SWLD LLC C/O CALFOX-Whitehall	1561 South Whitehall Lane, St. Helena	0	0	0
23427	Provenance Vineyards	1695 Saint Helena Highway, St. Helena	0.8	0	0
200514	Colinas Farming Company	990 Rutherford Road, Rutherford	0.2	0	0
From Project Sources***					
Project Construction TAC Impacts (Section A – Year 2022)			0.39	0.01	0.05
Project Construction TAC Impacts (Section B – Year 2023)			0.34	0.01	0.04
Project Construction TAC Impacts (Section C – Year 2024)			0.98	0.03	0.13
Project-Level Significance Thresholds			10	1.0	0.3
Significant Project Construction Impact?			No	No	No
From Cumulative Sources					
Cumulative Sources TAC Impact (Maximum)			1.98	0.03	0.31
Cumulative Significance Thresholds			100	10	0.8
Significant Cumulative Impact?			No	No	No

*The BAAQMD's Permitted Sources Risk and Hazards GIS Map Tool was used to estimate the maximum cancer risk, hazard index, and $PM_{2.5}$ concentration at locations close to the boundaries of each stationary source in the Project site's zone of influence (i.e., within 1000 feet of the Project site boundary).

** The PM2.5 reference level (0.66) for Upper Valley Disposal from the BAAQMD GIS Map Tool was scaled down by a factor of 0.28 to estimate the impact of its particulate emissions at the closest residence at about 600 feet from that facility's boundary.

***Project worst-case construction cancer risk, chronic hazard and $PM_{2.5}$ increments were estimated by the SCREEN3 dispersion model using Project construction equipment TAC emission estimates from the CalEEMod model. Project construction cancer risk, chronic hazard and PM2.5 could be reduced by an additional 50% by requiring that Project construction equipment have retrofitted Level 2 diesel particulate filters, or by an additional 90% by requiring that Project construction equipment have Tier 4 diesel engines.

Appendix C

Biological Data

Table 1. Special-Status Plant Species with Known or Potential Occurrence in the Vicinity of the Bale Slough-Bear Creek Restoration Project in Napa County, California.

Scientific Name	Common Name	Status (Federal/State, CRPR)	Life Form/Habitat Associations/ Elevation Range (feet)/Blooming Period/	Potential to Occur
Allium peninsulare var. *franciscanum*	Franciscan onion	None/None, CRPR 1B.2	Perennial bulbiferous herb. Cismontane woodland, valley and foothill grassland. Elevation 170-1,000 feet. Blooms May-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Alopecurus aequalis var. *sonomensis*	Sonoma alopecurus	Endangered/None, 1B.1	Perennial herb. Marshes and swamps (freshwater), riparian scrub. Elevation 15-1,200 feet. Blooms May-Jul.	Not expected to occur. Although potentially suitable habitat for this species is present within the project area, there are no documented occurrences in Napa County.
Amorpha californica var. *napensis*	Napa false indigo	None/None, CRPR 1B.2	Perennial deciduous shrub. Broadleaved upland forest (openings), chaparral, cismontane woodland. Elevation 390-6,560 feet. Blooms Apr-Jul.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Amsinckia lunaris	bent-flowered fiddleneck	None/None, CRPR 1B.2	Annual herb. Coastal bluff scrub, cismontane woodland, valley and foothill grassland. Elevation 5-1,640 feet. Blooms Mar-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Arctostaphylos bakeri ssp. *bakeri*	Baker's manzanita	None/Rare, CRPR 1B.1	Perennial evergreen shrub. Broadleaved upland forest, chaparral (often serpentinite). Elevation 225-900 feet. Blooms Feb-Apr.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Arctostaphylos stanfordiana ssp. *decumbens*	Rincon Ridge manzanita	None/None, CRPR 1B.1	Perennial evergreen shrub. Chaparral (rhyolitic), cismontane woodland. Elevation 245-1,215 feet. Blooms Feb-Apr.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Astragalus claranus	Clara Hunt's milk-vetch	Endangered/Threatened, CRPR 1B.1	Annual herb. Chaparral (openings), cismontane woodland, valley and foothill grassland. Elevation 245-900 feet. Blooms Mar-May.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.

Scientific Name	Common Name	Status (Federal/State, CRPR)	Life Form/Habitat Associations/ Elevation Range (feet)/Blooming Period/	Potential to Occur
Astragalus tener var. *tener*	alkali milk-vetch	None/None, CRPR 1B.2	Annual herb. Playas, valley and foothill grassland (adobe clay), vernal pools. Elevation 0-195 feet. Blooms Mar-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Balsamorhiza macrolepis	big-scale balsamroot	None/None, CRPR 1B.2	Perennial herb. Chaparral, cismontane woodland, valley and foothill grassland. Elevation 145-5,100 feet. Blooms Mar-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Blennosperma bakeri	Sonoma sunshine	Endangered/Endangered, CRPR 1B.1	Annual herb. Valley and foothill grassland (mesic), vernal pools. Elevation 30-360 feet. Blooms Mar-May.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Brodiaea leptandra	narrow-anthered brodiaea	None/None, CRPR 1B.2	Perennial bulbiferous herb. Broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland (volcanic). Elevation 360-3,000 feet. Blooms May-Jul.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Calycadenia micrantha	small-flowered calycadenia	None/None, 1B.2	Annual herb. Preference for open and dry sites associated with chaparral, meadows/seeps, and valley/foothill grassland. Sometimes on serpentine. Elevation 15–5,000 feet. Blooms Jun–Sep.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Castilleja ambigua var. *meadii*	Mead's owl's clover	None/None, CRPR 1B.1	Annual herb (hemiparasitic). Meadows and seeps, vernal pools (gravelly, volcanic, clay). Elevation 1,300-1,500 feet. Blooms Apr-May.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Ceanothus confusus	Rincon Ridge ceanothus	None/None, CRPR 1B.1	Perennial evergreen shrub. Closed-cone coniferous forest, chaparral, cismontane woodland. Elevation 245-3,495 feet. Blooms Feb-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Ceanothus divergens	Calistoga ceanothus	None/None, CRPR 1B.2	Perennial evergreen shrub. Chaparral (serpentinite or volcanic, rocky). Elevation 555-3,115 feet. Blooms Feb-Apr.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.

Scientific Name	Common Name	Status (Federal/State, CRPR)	Life Form/Habitat Associations/ Elevation Range (feet)/Blooming Period/	Potential to Occur
Ceanothus purpureus	holly-leaved ceanothus	None/None, CRPR 1B.2	Perennial evergreen shrub. Chaparral, cismontane woodland. Elevation 390-2,100 feet. Blooms Feb-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Ceanothus sonomensis	Sonoma ceanothus	None/None, CRPR 1B.2	Perennial evergreen shrub. Chaparral (sandy, serpentinite or volcanic). Elevation 705-2,625 feet. Blooms Feb-Apr.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Centromadia parryi ssp. *parryi*	pappose tarplant	None/None, CRPR 1B.2	Annual herb. Chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), valley and foothill grassland (vernally mesic). Elevation 0-1,380 feet. Blooms May-Nov.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Chorizanthe valida	Sonoma spineflower	Endangered/Endangered, CRPR 1B.1	Annual herb. Coastal prairie (sandy). Elevation 30-1,000 feet. Blooms Jun-Aug.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Downingia pusilla	dwarf downingia	None/None, CRPR 2B.2	Annual herb. Valley and foothill grassland (mesic), vernal pools. Elevation 0-1,460 feet. Blooms Mar-May.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Erigeron greenei	Greene's narrow-leaved daisy	None/None, CRPR 1B.2	Perennial herb. Chaparral (serpentinite or volcanic). Elevation 240-3,100 feet. Blooms May-Sep.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Eryngium constancei	Loch Lomond button-celery	Endangered/Endangered, 1B.1	Annual or perennial herb. Associated with vernal pools in Napa, Sonoma, and Lake counties. Elevation 1,500-3,000 feet. Blooms Apr–Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Eryngium jepsonii	Jepson's coyote thistle	None/None, CRPR 1B.2	Perennial herb found in valley and foothill grassland, vernal pools (clay). Elevation 0-900 feet. Blooms Apr-Aug.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Extriplex joaquinana	San Joaquin spearscale	None/None CRPR 1B.2	Annual herb. Chenopod scrub, meadows and seeps, playas, valley and foothill grassland (alkaline). Elevation 0-2,600 feet.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.

Scientific Name	Common Name	Status (Federal/State, CRPR)	Life Form/Habitat Associations/ Elevation Range (feet)/Blooming Period/	Potential to Occur
Fritillaria liliacea	fragrant fritillary	None/None, 1B.2	Perennial bulbiferous herb. Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland. Elevation 0-1,345 feet. Blooms Feb-Apr.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Hemizonia congesta ssp. *congesta*	congested-headed hayfield tarplant	None/None, CRPR 1B.2	Annual herb. Valley and foothill grassland. Elevation 65-1,835 feet. Blooms Apr-Nov.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Hesperolinon bicarpellatum	two-carpellate western flax	Threatened/Threatened, CRPR 1B.1	Annual herb. Chaparral, valley and foothill grassland. Elevation 15-1,215 feet. Blooms Apr-Jul.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Hesperolinon sharsmithiae	Sharsmith's western flax	None/None, CRPR 1B.2	Annual herb. Chaparral (serpentinite). Elevation 800-900 feet. Blooms May-Jul.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Horkelia tenuiloba	thin-lobed horkelia	None/None, CRPR 1B.2	Perennial herb. Broadleaved upland forest, chaparral, valley and foothill grassland. Elevation 160-1,640 feet. Blooms May-Jul.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Juglans hindsii	Northern California black walnut	None/None, CRPR 1B.1	Perennial deciduous tree. Riparian forest, riparian woodland. Elevation 0-1,500 feet. Blooms Apr-May.	Not expected to occur. Although there is potentially suitable habitat for this species within the project area, there are no documented occurrences in Napa County.
Lasthenia burkei	Burke's goldfields	Endangered/Endangered, 1B.1	Annual herb. Meadows and seeps (mesic), vernal pools. Elevation 45-1,970 feet. Blooms Apr-Jun.	Not expected to occur. Suitable habitat and soils for this species are not present within or adjacent to the project area.
Lasthenia conjugens	Contra Costa goldfields	Endangered/None, CRPR 1B.1	Annual herb. Cismontane woodland, playas (alkaline), valley and foothill grassland, vernal pools. Elevation 0-1,540 feet. Blooms Mar-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	None/None, CRPR 1B.2	Perennial herb. Marshes and swamps (freshwater and brackish). Elevation 0-15 feet. Blooms May-Jul (Aug-Sep).	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.

Scientific Name	Common Name	Status (Federal/State, CRPR)	Life Form/Habitat Associations/ Elevation Range (feet)/Blooming Period/	Potential to Occur
Layia septentrionalis	Colusa layia	None/None, 1B.2	Annual herb. Chaparral, cismontane woodland, valley and foothill grassland. Elevation 325-3,595 feet. Blooms Apr-May.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Legenere limosa	legenere	None/None, CRPR 1B.1	Annual herb. Vernal pools. Elevation 0-2,885 feet. Blooms Apr-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Leptosiphon jepsonii	Jepson's leptosiphon	None/None, CRPR 1B.2	Annual herb. Chaparral, cismontane woodland, valley and foothill grassland. Elevation 325-1,640 feet. Blooms Mar-May.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Lilaeopsis masonii	Mason's lilaeopsis	None/Rare, CRPR 1B.1	Perennial rhizomatous herb. Marshes and swamps (brackish or freshwater), riparian scrub. Elevation 0-30 feet. Blooms Apr-Nov.	Not expected to occur. Although there is potentially suitable habitat for this species within the project area, the nearest documented occurrence is over 12 miles south of the site along the Napa River.
Limnanthes vinculans	Sebastopol meadowfoam	Endangered/Endangered, CRPR 1B.1	Annual herb. Meadows and seeps, valley and foothill grassland, Vernal pools. Elevation 45-1,000 feet. Blooms Apr-May.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Lupinus sericatus	Cobb Mountain lupine	None/None, CRPR 1B.2	Perennial herb. Broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest. Elevation 825-4,600 feet. Blooms Mar-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Navarretia leucocephala ssp. bakeri	Baker's navarretia	None/None, 1B.1	Annual herb. Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. Elevation 15-5,710 feet. Blooms Apr-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Navarretia leucocephala ssp. *pauciflora*	few-flowered navarretia	Endangered/Threatened, CRPR 1B.1	Annual herb. Vernal pools. Elevation 1,200-2,565 feet. Blooms May-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.

Scientific Name	Common Name	Status (Federal/State, CRPR)	Life Form/Habitat Associations/ Elevation Range (feet)/Blooming Period/	Potential to Occur
Navarretia leucocephala ssp. *plieantha*	many-flowered navarretia	Endangered/Endangered, 1B.2	Annual herb. Vernal pools (volcanic ash flow). Elevation 95-3,115 feet. Blooms May-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Penstemon newberryi var. *sonomensis*	Sonoma beardtongue	None/None, CRPR 1B.3	Perennial herb. Chaparral (rocky). Elevation 2,295-4,495 feet. Blooms Apr-Aug.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Plagiobothrys strictus	Calistoga popcornflower	Endangered/Threatened, 1B.1	Annual herb. Alkaline areas near thermal springs, meadows/seeps, valley/foothill grasslands, and vernal pools. Elevation 300–550 feet. Blooms Mar–Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Poa napensis	Napa blue grass	None/Threatened, 1B.1	Perennial rhizomatous herb. Broadleaved upland forest, meadows and seeps, North Coast coniferous forest. Elevation 30-2,200 feet. Blooms Apr-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Puccinellia simplex	California alkali grass	None/None, 1B.2	Annual herb. Prefers alkaline and vernally mesic sinks flats, and lake margins. Elevation 6–3,000 feet. Blooms Mar–May.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Sagittaria sanfordii	Sanford's arrowhead	None/None, CRPR 1B.2	Perennial rhizomatous emergent herb found in marshes and swamps. Elevation 0-650 meters. Blooms May-Oct.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Sidalcea oregana ssp. *hydrophila*	marsh checkerbloom	None/None, 1B.2	Perennial herb associated with mesic substrates in meadows/seeps and riparian forests. Elevation 1,100–7,500 feet. Blooms (Jun)Jul–Aug.	Low potential to occur. Although the riparian habitat within the project area may support this plant, the nearest documented occurrence is over seven miles north of the project area.
Sidalcea oregana ssp. *valida*	Kenwood Marsh checkerbloom	Endangered/Endangered, 1B.1	Rhizomatous herb associated with freshwater marshes and swamps. Elevation 390–490 feet. Blooms Jun–Sep.	Not expected to occur. Suitable habitat and soils for this species are not present within or adjacent to the project area.
Spergularia macrotheca var. *longistyla*	long-styled sand-spurrey	None/None, 1B.2	Perennial herb. Prefers alkaline substrates associated with meadows/seeps and marshes/swamps. Elevation 0–850 feet. Blooms Feb–May.	Not expected to occur. Suitable habitat and soils for this species are not present within or adjacent to the project area.

Scientific Name	Common Name	Status (Federal/State, CRPR)	Life Form/Habitat Associations/ Elevation Range (feet)/Blooming Period/	Potential to Occur
Sidalcea hickmanii ssp. *napensis*	Napa checkerbloom	None/None, CRPR 1B.1	Perennial herb. Chaparral (rhyolitic). Elevation 1,240-1,850 feet. Blooms Apr-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Streptanthus hesperidis	green jewelflower	None/None, CRPR 1B.2	Annual herb. Chaparral (openings), cismontane woodland (serpentinite, rocky). Elevation 390-2,300 feet. Blooms May-Jul.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Symphyotrichum lentum	Suisun Marsh aster	None/None, CRPR 1B.2	Perennial rhizomatous herb. Marshes and swamps (brackish and freshwater). Elevation 0-10 feet. Blooms (Apr) May-Nov.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Trifolium amoenum	two-fork clover	Endangered/None, CRPR 1B.1	Annual herb. Coastal bluff scrub, valley and foothill grassland (sometimes serpentinite). Elevation 15-1,360 feet. Blooms Apr-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Trifolium hydrophilum	saline clover	None/None, CRPR 1B.2	Annual herb. Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools. Elevation 0-985 feet. Blooms Apr-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Trichostema ruygtii	Napa bluecurls	None/None, CRPR 1B.2	Annual herb. Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland, vernal pools. Elevation 90-2,100 feet. Blooms Jun-Oct.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
Viburnum ellipticum	oval-leaved viburnum	None/None, CRPR 2B.3	Perennial deciduous shrub. Chaparral, cismontane woodland, lower montane coniferous forest. Elevation 705-4,595 feet. Blooms May-Jun.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.

[1]Status Legend:

California Rare Plant Ranks (CRPR):

1A – Plants presumed extinct in California

1B – Plants rare, threatened, or endangered in California and elsewhere

2 – Plants rare, threatened, or endangered in California, but more common elsewhere

CRPR Threat Code Extensions:
.1 – Seriously endangered in California
.2 – Fairly endangered in California

[2] Definitions Regarding Potential for Occurrence

- Not expected to occur – Habitat on and adjacent to the site is unsuitable for the species life history requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, soils, site history, and disturbance regime).
- Low – Few of the habitat components meeting the species life history requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of poor quality. The species is not likely to found on the site.
- Moderate – Some of the habitat components meeting the species life history requirements are present, there may be documented occurrences of the species in the vicinity of the site, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
- High – All of the habitat components meeting the species life history requirements are present, there may be documented occurrences of the species on or adjacent to the site and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
- Present – Species was observed on the site.

Sources

California Native Plant Society, Rare Plant Program. 2020. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed December 2020].

California Department of Fish and Wildlife (CDFW). 2020. RareFind 5 Version 5.2.14. Website https://apps.wildlife.ca.gov/rarefind/view/RareFind.aspx [accessed December 2020]

Table 2. Special-Status Wildlife Species with Known or Potential Occurrence in the Vicinity of the Bale Slough-Bear Creek Restoration Project in Napa County, California.

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential to Occur in the Project Area
Invertebrates				
California freshwater shrimp	*Syncaris pacifica*	Endangered/Endangered	California freshwater shrimp is found in low to moderate gradient perennial creeks and streams where there is some emergent vegetation, high water quality, and good oxygen levels. Some salinity is tolerated, although they are not found in any tidally influenced or brackish waters. Oviposition occurs in late spring and eggs hatch in June.	Not expected to occur. Because the section of Bear Creek within the project area is an intermittent stream, it does not provide suitable habitat for this species.
crotch bumblebee	*Bombus crotchii*	None/Candidate Endangered	Crotch bumble bee was historically common throughout much of the southern two-thirds of California, but now appears to be absent from most of the state. Most bumble bees are primitively eusocial insects that live in colonies composed of a queen, workers, and, near the end of the season, reproductive members of the colony (new queens, or gynes, and males). Habitat requirements include availability of suitable colony nesting sites, floral resources to obtain nectar and pollen throughout the duration of the colony period (spring, summer and fall), and suitable overwintering sites for queens.	Low potential to occur. Potentially suitable foraging habitat exists for this species within and adjacent to the proposed project areas; however, there are no documented occurrences of this species within Napa County.
western bumblebee	*Bombus occidentalis*	USFS Sensitive/Candidate Endangered	Western bumblebee habitat requirements include availability of suitable colony nesting sites, floral resources to obtain nectar and pollen throughout the duration of the colony period (spring, summer and fall), and suitable overwintering sites for queens. Most bumble bees are primitively eusocial insects that live in colonies composed of a queen, workers, and, near the end of the season, reproductive members of the colony (new queens, or gynes, and males). Nest sites typically include underground cavities and open west-southwest slopes bordered by trees. Little is known about hibernacula or overwintering sites.	Low potential to occur. Although there are potentially suitable floral resources in the vicinity of the project area, there are few suitable nest sites and the nearest documented occurrence is 13 miles south of the project area.
Fish				

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential to Occur in the Project Area
Delta smelt	*Hypomesus transpacificus*	Threatened/Endangered	Delta smelt are able to tolerate a wide variety of salinity levels. For a large part of their one-year life span, delta smelt live along the freshwater edge of the mixing zone (saltwater-freshwater interface). Shortly before spawning, adults migrate upstream from the brackish-water habitat associated with the mixing zone and disperse widely into river channels and tidally influenced backwater sloughs, where they spawn in shallow, fresh or slightly brackish water.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the proposed project area.
longfin smelt	*Spirinchus thaleichthys*	Candidate Threatened/ Threatened	Longfin smelt is a pelagic estuarine fish. They generally spawn in freshwater and then move downstream to brackish water to mature, as the life cycle of most longfin smelt generally requires estuarine conditions. Longfin smelt are thought to be restricted by high water temperatures, generally greater than 22°C. Most longfin smelt in the San Francisco Bay are believed to breed in the lower reaches of the Sacramento and San Joaquin Rivers.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the proposed project area.
steelhead – central California coast DPS (NMFS)	*Oncorhynchus mykiss irideus*	Threatened/None	Central California coast steelhead spawns in streams from the Russian River to Aptos Creek, Santa Cruz County, California (inclusive). They also occur in drainages of San Francisco and San Pablo Bays. Regardless of life history strategy, for the first year or two of life rainbow trout and steelhead are found in cool, clear, fast-flowing permanent streams and rivers where riffles predominate over pools, there is ample cover from riparian vegetation or undercut banks, and invertebrate life is diverse and abundant.	Not expected to occur. Although suitable habitat for this species is present within the project area, the stream channel will be dry when the work is expected to occur.
Amphibians and Reptiles				
California giant salamander	*Dicamptodon ensatus*	None/SSC	California giant salamander occurs in wet coastal forests in or near clear, cold permanent and semi-permanent streams and seepages. Aquatic larvae transform into four-legged salamanders that live on the ground and breathe air with lungs. Neotenic adults which retain their gills and continue to live in water are found in many populations. This salamander is nocturnal but is also active in daylight in wet conditions. They can be found walking across roads on rainy nights, especially with the first heavy rains of the fall. Adults are also found under cover objects such as rocks, logs and artificial cover items.	Not expected to occur. Bear Creek and the surrounding vegetation structure does not provide suitable habitat for this species.

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential to Occur in the Project Area
California red-legged frog	*Rana draytonii*	Threatened/None, SSC	California red-legged frog occurs in different habitats depending on their life stage, the season, and weather conditions. Breeding habitat includes coastal lagoons, marshes, springs, permanent and semi-permanent natural ponds, and ponded and backwater portions of streams, as well as artificial impoundments including stock ponds, irrigation ponds, and siltation ponds. Creeks and ponds with dense growths of woody riparian vegetation, especially willows (*Salix* spp.) near deep (≥2 to 3 feet), still or slow-moving water are preferred, although the absence of vegetation at an aquatic site does not rule out the possibility of occupancy.	Low potential to occur. Although the creek provides potentially suitable habitat for this species during certain times of the year, the intermittent nature of the creek likely precludes this species from occurring. The nearest documented occurrence of this species is over 12 miles east of the project area.
California tiger salamander	*Ambystoma californiense*	Threatened/Threatened	California tiger salamander (CTS) may be found in riparian and wet meadow habitats but is more common in grasslands. CTS spend most of its life cycle underground in adjacent valley oak woodland or grassland habitat, primarily in rodent burrows. Breeding takes place following the first heavy winter rains. Temporary or permanent freshwater pools or slowly flowing streams are required for egg-laying and larval development. They appear to be absent in waters containing predatory game fish.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area and the project area is outside of the species known range.
foothill yellow-legged frog	*Rana boylii*	None/Candidate Threatened, SSC	Foothill yellow-legged frog frequents rocky streams and rivers with rocky substrate and open, sunny banks, in forests, chaparral, and woodlands. Sometimes found in isolated pools, vegetated backwaters, and deep, shaded, spring-fed pools.	Low potential to occur. Although the creek provides potentially suitable habitat for this species during certain times of the year, the intermittent nature of the creek likely precludes this species from occurring during the work period. The nearest documented occurrence of this species is approximately 1.5 miles northeast of the project area in Coon Creek.

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential to Occur in the Project Area
red-bellied newt	*Taricha rivularis*	None/SSC	Red-bellied newt is a stream or river dweller found in coastal woodlands and redwood forest along the coast of northern California from near Bodega, Sonoma County, to near Honeydew, Humboldt county, and inland to Lower lake and Kelsey Creek, Lake County. Adults are terrestrial, becoming aquatic when breeding. Terrestrial animals spend the dry summer in moist habitats under woody debris, rocks, and in animal burrows. Juveniles apparently spend most of their time underground and are not active on the surface until near sexual maturity. Ponds, lakes, and other standing waters are avoided.	Low potential to occur. Although the creek provides potentially suitable habitat for this species during certain times of the year, the intermittent nature of the creek likely precludes this species from occurring. There are no documented occurrences of this species in Napa County.
western pond turtle	*Emys marmorata*	None/SSC	Western pond turtles are found in rivers, lakes, streams, ponds, wetlands, ephemeral creeks, reservoirs, agricultural ditches, estuaries, and brackish waters. Western pond turtles prefer areas that provide cover from predators, such as vegetation and algae, as well as basking sites for thermoregulation. Adults tend to favor deeper, slow moving water, whereas hatchlings search for slow and shallow water that is slightly warmer. Terrestrial habitats are used for egg laying and wintering and usually consist of burrows in leaves and soil. They are rarely found at altitudes above 1,500 meters.	Low potential to occur. Although the creek provides potentially suitable habitat for this species during certain times of the year, the intermittent nature of the creek likely precludes this species from occurring during the work period. The nearest documented occurrence of this species is approximately one mile east of the project area in Coon Creek.
Birds				

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential to Occur in the Project Area
American peregrine falcon	*Falco peregrinus anatum*	Delisted/Delisted, FP	American peregrine falcon is found in a variety of open habitats, cliffs (mountains to coast), and sometimes cities. It is often found near water, especially along the coast, and migrants may fly far out to sea. This species is limited by availability of nest sites and prey, and it often moves into cities, nesting on building ledges and feeding on pigeons.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the proposed project area.
bald eagle	*Haliaeetus leucocephalus*	Delisted/Endangered, FP	Bald eagle lives near large bodies of open water such as lakes, marshes, estuaries, seacoasts and rivers where fish are abundant. Usually nests within one mile of water in tall trees with open branch work bordering lakes or large rivers. In Central California, bald eagles prefer foothill pines for nesting.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the proposed project area.
bank swallow	*Riparia riparia*	None/Threatened	Bank swallow is restricted to riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with fine-textured or sandy soils, into which it digs nesting holes. It feeds predominantly over open riparian areas, but also over brushland, grassland, wetlands, water, and cropland.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the proposed project area.
black swift	*Cypseloides niger*	None/SSC	Black swift nests in moist crevices, caves, and cliffs behind or adjacent to waterfalls in deep canyons, and forages over a wide range of habitats.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the proposed project area.
burrowing owl	*Athene cunicularia*	None/SSC	Burrowing owl utilizes abandoned ground squirrel burrows in open habitats, grasslands, and disturbed areas, typically on levees, mounds or areas where there are unobstructed views of possible predators such as raptors or foxes. Prey items include insects, small mammals, reptiles and amphibians.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the proposed project area.
golden eagle	*Aquila chrysaetos*	BGEPA/FP	Golden eagle is found in open country, including mountains, foothills, and plains. In the west, they are found over prairie, rangeland, or desert. They are very wide-ranging in winter, and more restricted to areas with good nest sites in summer, which consist of cliff ledges or large trees.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the proposed project area.
grasshopper sparrow	*Ammodramus savannarum*	None/SSC	Grasshopper sparrow is found in grasslands, hayfields and prairies. Breeds in dry fields and prairies, especially those with fairly tall grass and weeds and a few scattered shrubs. Also nests in overgrown pastures and hayfields, and sometimes in fields of other crops. May nest in small colonies. Forages for mostly insects and seeds.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential to Occur in the Project Area
northern spotted owl	*Strix occidentalis caurina*	Threatened/Threatened	Northern spotted owls generally inhabit older stands of forested habitats that contain multi-layered, multi-species canopy with moderate to high canopy closure. These stands typically contain a high number of trees with large cavities and other types of deformities, including large snags (standing dead trees), an abundance of large, dead wood on the ground, and open space within and below the upper canopy for spotted owls to fly. Prey items include primarily flying squirrels and dusky-footed woodrats, as well as mice, voles, rabbits, birds and bats.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the proposed project area.
purple martin	*Progne subis*	None/SSC	Purple martin occurs in towns, farms, and semi-open country near water; in the west it also inhabits mountain forest and saguaro desert. Nests in cavities of trees, usually in colonies. Forages for flying insects.	Moderate potential to occur. Suitable nesting and foraging habitat for this species is present within and adjacent to the project area, and the nearest documented occurrence is approximately three miles north of the project area.
saltmarsh common yellowthroat	*Geothlypis trichas sinuosa*	None/SSC	Saltmarsh common yellowthroat remains locally numerous in areas where extensive wetlands with adjacent riparian thickets remain. In brackish and saline tidal marsh habitat around San Francisco Bay, yellowthroats prefer habitats consisting of rushes (*Scirpus* spp.), peppergrass (*Leipidium latifolium*), and *Juncus*.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the proposed project area.
San Pablo song sparrow	*Melospiza melodia samuelis*	None/SSC	San Pablo song sparrow inhabits salt marshes along the northern edge of the San Francisco and San Pablo bays, and on the south side of San Pablo Bay, southwest to San Pablo Point on the Richmond headland.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the proposed project area.
Swainson's hawk	*Buteo swainsoni*	None/Threatened	Swainson's hawk spends the breeding season in the Central Valley of California and is commonly found in agricultural areas or open grasslands containing solitary trees for nesting. Its diet consists of insects, small mammals and reptiles.	Moderate potential to occur. Suitable nesting habitat for this species occurs within and adjacent to the project area, and foraging habitat occurs in the vicinity of the project area. There is a documented occurrence approximately 1.5 miles southeast of the project area.

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential to Occur in the Project Area
tricolored blackbird	*Agelaius tricolor*	None/Threatened, SSC	Tricolored blackbird is a colonial species found almost exclusively in California. It utilizes wetlands, marshes and agricultural grain fields for foraging and nesting. The tricolored blackbird population has declined significantly in recent years due to habitat loss and harvest of grain fields before young have fledged.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the proposed project area.
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	Threatened/Endangered	Western yellow-billed cuckoo inhabits woodlands, thickets, orchards, streamside groves. Breeds mostly in dense deciduous stands, including forest edges, tall thickets, dense second growth, overgrown orchards, scrubby oak woods. Often in willow groves around marshes. In the west, mostly in streamside trees, including cottonwood-willow groves in arid country. Forages by scaling through shrubs and trees, gleaning insects from foliage and branches.	Not expected to occur. Although potentially suitable habitat for this species occurs within the project area, there are no documented occurrences of this species in Napa County.
white-tailed kite	*Elanus leucurus*	None, FP	White-tailed kite nests in woodland, riparian, and individual trees near open lands; forages opportunistically in grassland, meadows, scrubs, agriculture, emergent wetland, savanna, and disturbed lands.	Moderate potential to occur. Suitable nesting habitat for this species occurs within and adjacent to the project area, and foraging habitat occurs in the vicinity of the project area. There is a documented occurrence approximately 5 miles south of the project area.
yellow rail	*Coturnicops noveboracensis*	USFS Sensitive/SSC	Yellow rail is highly secretive, and its range and abundance is incompletely known because of this. They prefer densely vegetated marshes, and sedge marshes/meadows with moist soil or shallow standing water for breeding. They are very rare, but currently known to winter in a few coastal marshes along the Pacific coast and Suisun Marsh near Fairfield, California.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the proposed project area.
Mammals				

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential to Occur in the Project Area
American badger	*Taxidea taxus*	None/SSC	American badger is most abundant in drier open stages of most shrub, forest and grassland habitats with friable soils. It digs burrows for cover and will reuse burrows occasionally but may also dig new burrows each night in the summer. Its diet consists of rodents, small mammals, reptiles, insects, birds and carrion.	Not expected to occur. Suitable habitat for this species is not present within or adjacent to the project area.
pallid bat	*Antrozous pallidus*	None/SSC	Pallid bat occupies a variety of habitats including grassland, shrubland, woodland and forests from sea level up through mixed conifer forest. Roosts in caves, mines, crevices and occasionally hollow trees or buildings. Prefers open habitats for foraging.	Moderate potential to occur. Suitable foraging and roosting habitat exist within and adjacent to the project area.
Townsend's big-eared bat	*Corynorhinus townsendii*	None/SSC	Townsend's big-eared bat is found throughout most of western North America. Hibernates and roosts in caves and mines near entrances, or cave like structures such as buildings or under decks. Forages in forested habitats, along open edges.	Low potential to occur. The project area lacks suitable roosting habitat but provides suitable foraging habitat. The nearest documented occurrence is approximately seven miles north of the project area.

[1] Legend

SSC: Species of Special Concern (CDFW)
FP: Fully Protected (CDFW)
ESU: Evolutionarily Significant Unit
DPS: Distinct Population Segment
PPT: parts per thousand
BGEPA: Bald and Golden Eagle Protection Act
USFS: United States Forest Service

[2] Definitions Regarding Potential for Occurrence

- Not expected to occur – Habitat within and adjacent to the project area is unsuitable for the species life history requirements (foraging, breeding, cover, range, elevation, hydrology, vegetation community, site history, and/or disturbance regime) There are no documented occurrences of the species in the vicinity of the project area.
- Low – Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the project area is unsuitable or of poor quality. The species is not likely to found within the project area. Any documented occurrences are farther than likely possible for the species to occur in the project area.

- Moderate – Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the project area is unsuitable. There are documented occurrences in the near vicinity of the project area and therefore, the species has a moderate probability of being found within the project area.
- High – All of the habitat components meeting the species requirements are present, and/or most of the habitat on or adjacent to the project area is highly suitable. There are documented occurrences of the species on or immediately adjacent to the project area and therefore, the species has a high probability of being found within the project area.
- Present – Species was observed within the project area or has been recorded (i.e., CNDDB, or other reports) within the project area recently.

Sources:

California Department of Fish and Wildlife (CDFW). 2020. California Natural Diversity Database (CNDDB). Rarefind, Version 5 (Commercial Subscription) dated February 1, 2020. Accessed December 15, 2020. https://apps.wildlife.ca.gov/rarefind/view/RareFind.aspx

Appendix D

Historical Property Survey Finding of Effect

HISTORIC PROPERTY SURVEY REPORT/
FINDING OF EFFECT

BALE SLOUGH-BEAR CREEK TRIBUTARY RESTORATION PROJECT
NAPA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
NAPA COUNTY, CALIFORNIA

FOR

QUESTA ENGINEERING
Richmond, CA 94807

BY

BASIN RESEARCH ASSOCIATES
1933 Davis Street, Suite 215
San Leandro, CA 94577

AUGUST 2021

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 PROJECT LOCATION AND DESCRIPTION 2
Project Location 2
2.1 DESCRIPTION 3
2.1A Group A 3
2.1B Group B 3
2.1C Group C 4
Typical Channel Cross Section 4
2.2 AREA OF POTENTIAL EFFECTS (APE) 5

3.0 REGULATORY CONTEXT 5
3.1 FEDERAL 5
3.2 STATE 6

4.0 BACKGROUND CONTEXT 9
4.1 ENVIRONMENTAL SETTING 9
4.2 NATIVE AMERICAN 9
4.2A Prehistoric 9
4.2B Ethnographic 11
4.3 HISTORIC PERIOD 12
4.3A Hispanic Era 12
4.3B American Period 14

5.0 RESEARCH PROTOCOLS 17
5.1 RECORDS SEARCH RESULTS 17
5.1A Group A 18
P-28-000136 / CA-NAP-144 24
P-28-000470 / CA-NAP-58 25
5.1B Group B 26
5.1C Group C 26
P-28-000472 / CA-NAP-590 27
P-28-000473 / CA-NAP-591 28
P-28-000474 / CA-NAP-592 28
P-28-000475 / CA-NAP-593/H 29
P-28-001547 (Napa Valley Railroad District) 30
P-28-000966 / CA-NAP-1113H 31
5.2 FIELD INVENTORY 31
5.2A Field Inventory (July 22-23, 2020) 32
5.2B Field Inventory (June 15, 2021) 32

5.3 FIELD INVENTORY RESULTS BY GROUP 33
5.3A Group A 33
5.3B Group B 33
5.3C Group C 34
5.4 BACKHOE PRESENCE/ABSENCE TESTING PROGRAM 34
5.5 SUMMARY 37

6.0 INDIVIDUALS, GROUP AND AGENCY PARTICIPATION 38
6.1 OTHER CONSULTATION 38

7.0 FINDING OF EFFECT 39
7.1 IDENTIFIED RESOURCES AND EVALUATIONS 39
7.2 SUMMARY 39

8.0 RECOMMENDATIONS 40

9.0 REFERENCES 41

ATTACHMENTS

FIGURES

FIGURE 1 General Project Location (ESRI World Street Map)
FIGURE 2 Area of Potential Effects - T7N R5W unsectioned (USGS Rutherford, Calif. 1973)
FIGURE 3 Area of Potential Effects with Recorded Cultural Resources in the Vicinity
FIGURE 4A Group A – Area of Potential Effects with Test Unit Locations
FIGURE 4B Group A – Area of Potential Effects with Test Unit Locations
FIGURE 4C Group A – Area of Potential Effects with Test Unit Locations
FIGURE 5 Area of Potential Effects with Photo View Locations
FIGURE 6 Group A – view northwest on the south side of Bale Slough
FIGURE 7 Group A – view northwest along the north side of Bale Slough
FIGURE 8 Group A – prehistoric cultural material found on the south side of Bale Slough, within the APE, in the vicinity of P-28-000136
FIGURE 9 Group A – view east on the south side of Bale Slough, in the vicinity of P-28-000136
FIGURE 10 Group A – view northwest within Bale Slough
FIGURE 11 Group A – view east from north end along the south side of Bale Slough
FIGURE 12 Group A – view southeast from north end along the north side of Bale Slough

TABLE OF CONTENTS, con't

ATTACHMENTS, con't

FIGURES, con't

FIGURE 13	Group B – view northwest from the east end along the south side of Bale Slough
FIGURE 14	Group B – vehicle bridge across Bale Slough constructed from railroad car, view east
FIGURE 15	Group B – view northwest along the north side of Bale Slough
FIGURE 16	Group B – view southeast along the south side of Bale Slough
FIGURE 17	Group B – view east along the north side of Bale Slough from just east of Hwy 29
FIGURE 18	Group B – view east along the south side of Bale Slough from just east of Hwy 29
FIGURE 19	Group C – Napa Valley Wine train trestle over Bale Slough, view south
FIGURE 20	Group C – view southwest across Site 13 east of Bale Slough from near Hwy 29
FIGURE 21	Group C – view northwest across Site 12 towards Bear Creek from near Hwy 29
FIGURE 22	Group C – view north along the east side of Bear Creek in Site 12
FIGURE 23	Group C – view east across Site 14 from the south end
FIGURE 24	Group C – view northeast toward P-28-000475/NAP-593
FIGURE 25	Group C Fill Area – view west toward general vicinity of P-28-000472/NAP-590
FIGURE 26	Group C Fill Area – visibility within P-28-000472/NAP-590
FIGURE 27	Group C Fill Area – view northwest toward location of P-28-000473/NAP-591
FIGURE 28	Group C Fill Area – view southeast across the fill area
FIGURE 29	Group C Fill Area – view northeast across the fill area
FIGURE 30	Group A – BTU 1, trench during excavation, view to southwest
FIGURE 31	Group A – BTU 1, south wall profile view
FIGURE 32	Group A – BTU 2, trench during excavation, view to southwest
FIGURE 33	Group A – BTU 2, west wall profile view
FIGURE 34	Group A – BTU 3, screened sediments
FIGURE 35	Group A – BTU 3, west wall profile view
FIGURE 36	Group A – BTU 4, trench during excavation with BTU 3 in foreground, view to north
FIGURE 37	Group A – BTU 4, west wall profile view

TABLE OF CONTENTS, con't

ATTACHMENTS, con't

FIGURES, con't

FIGURE 38	Group A – BTU 5, trench during excavation, view to northwest
FIGURE 39	Group A – BTU 5, west wall profile view
FIGURE 40	Group A – BTU 6, trench during excavation, view to west
FIGURE 41	Group A – BTU 6, west wall profile view
FIGURE 42	Group A – BTU 7, trench after excavation, view to southwest
FIGURE 43	Group A – BTU 7, west wall profile view
FIGURE 44	Group A – BTU 8, trench during excavation, view to northwest
FIGURE 45	Group A – BTU 8, west wall profile view
FIGURE 46	Group A – BTU 9, trench during excavation, view to northeast
FIGURE 47	Group A – BTU 9, west wall profile view
FIGURE 48	Group A – BTU 10, trench during excavation, view to northwest
FIGURE 49	Group A – BTU 10, west wall profile view
FIGURE 50	Group A – BTU 11, trench during excavation, view to northeast
FIGURE 51	Group A – BTU 11, west wall profile view

NATIVE AMERICAN OUTREACH

LETTER	Request to Native American Heritage Commission
LETTER	Native American Heritage Commission Response
LETTERS	Request to Native Americans Identified by Native American Heritage Commission
RESPONSE	Responses from Native American Outreach

CHRIS/NWIC SEARCH

SEARCH	CHRIS/NWIC File No. 20-0072 (Dated August 14, 2020) [No Confidential Information]

SITE FORM UPDATES (DPR 523)

FORM 1	P-28-000136 (CA-NAP-144
FORM 2	P-28-000472 (CA-NAP-590)
FORM 3	P-28-000473 (CA-NAP-591)
FORM 4	P-28-000474 (CA-NAP-592)
FORM 5	P-28-000475 (CA-NAP-593)

1.0 INTRODUCTION

This *Historic Property Survey Report/Finding of Effect* report (HPSR/FOE) represents the archaeological identification and evaluation effort completed for The Bale Slough-Bear Creek Tributary Restoration Project (undertaking) to be completed by the Napa County Flood Control and Water Conservation District (District). The goal of the undertaking is to improve salmonid and riparian habitat along Bear Creek and Bale Slough in an effort to support native steelhead trout and chinook salmon in the watershed and throughout Napa Valley. Proposed restoration elements include channel widening, floodplain restoration, biotechnical bank stabilization, in-stream habitat features and other improvements.

The review was requested to determine if significant cultural resources under the National Environmental Policy Act (NEPA) might be affected by the proposed action. The project must comply with Section 404 of the Clean Water Act (codified at 33 U.S.C. § 1344) and the regulatory requirements of the Department of the Army, Corps of Engineers (USACE) with regard to cultural resources (historic properties) to obtain a permit.

The USACE is the NEPA responsible entity and is required to complete the federal regulatory requirements for cultural resources pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) (54 U.S.C. § 306108) and its implementing regulations 36 CFR Part 800. The regulations require a federal agency with jurisdiction over a federal, federally assisted or federally licensed undertaking to take into account the effort of the undertaking on properties listed on or eligible for the National Register of Historic Places (NRHP) and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking should it adversely affect a NRHP eligible or NRHP listed property. The criteria for determining NRHP eligibility are found in 36 CFR Part 60.

The District is the lead local agency and USACE is the lead federal agency for the project. The USACE is responsible for consulting with the California State Historic Preservation Office (SHPO) on the identification and evaluation efforts and on the effects, if any, of the undertaking upon historic properties in accordance with 54 U.S.C. § 302303(b)(5), (b)(6) and (b)(9).

The Area of Potential Effects (APE) for Archaeology includes the area within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, should any be present within the APE. The horizontal and vertical APE consists of improvements within the Bale Creek alignment and proposed improvements. In addition, any temporary access roads and staging areas for material laydown and storage of excavated soil are included within the APE. The APE is commensurate with the footprint of the proposed undertaking.

The completion of an HPSR/FOE document will allow the project proponent to partially satisfy the regulations of the ACHP (36 CFR Part 800) for implementing Section 106 of the NHPA of 1966 as amended (54 U.S.C. § 306108). Section 106 studies provide the information necessary to satisfy the legal requirements for environmental documents or categorical exclusions under NEPA. In addition, the District, as the lead local agency, is required to determine the potential impacts of the improvements on both historical and archaeological cultural resources and

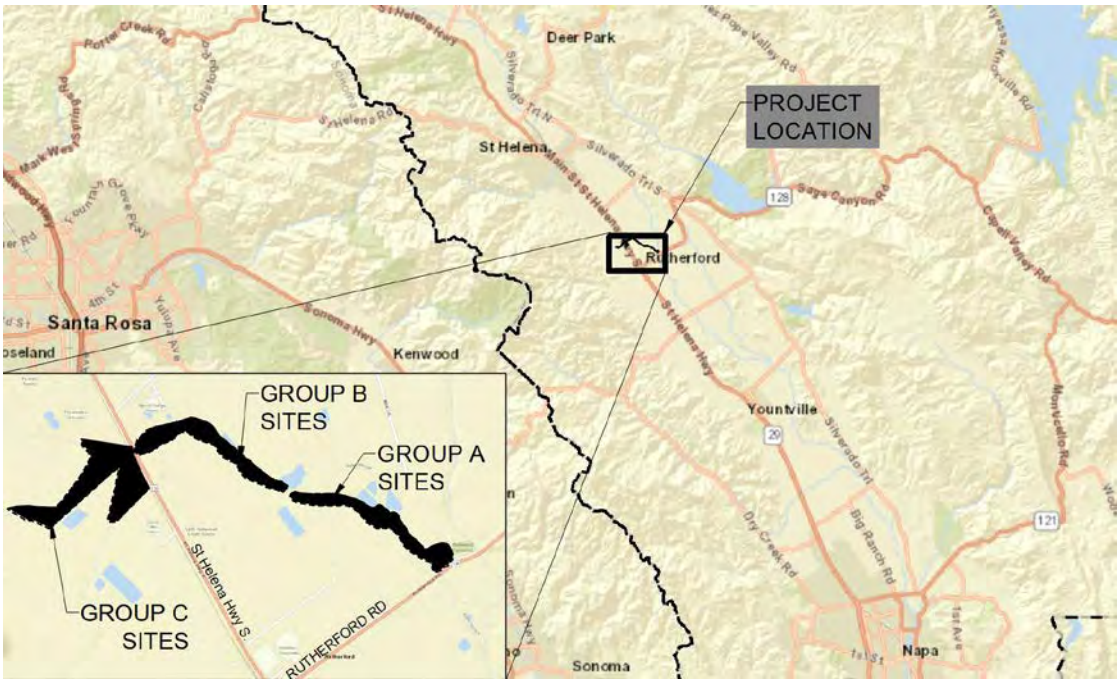
mitigate impacts on any significant resources that may be affected by the project to a less than significant effect in accordance with CEQA.

A finding of *No Adverse Effect* (36 CFR Part 800.5(b)) is recommended as the proposed undertaking will have no adverse effect on any historic properties as defined in 36 CFR Part 800.5(a)(1). The proposed restoration project will not affect any of the criteria that could compromise or contribute to the eligibility of the resources identified within or immediately adjacent to the proposed undertaking for the NRHP.

2.0 PROJECT LOCATION AND DESCRIPTION

Bale Slough-Bear Creek is a tributary of the Napa River that runs predominantly east from the foothills of the Mayacama Mountain Range to the confluence with the Napa River near the town of Rutherford, at Rutherford Cross Road (USGS Rutherford, Calif. 1973 T 7N R 5W, unsectioned [Figs. 1-3].

The upper part of the watershed is primarily undeveloped, with productive riparian habitat, and includes the perennial flowing tributary Bear Creek [see Fig. 3]. The lower reach of Bale Slough-Bear Creek was once part of an alluvial fan wetland complex that historically provided valuable habitat to Steelhead and Chinook salmon populations in the Napa Valley. This alluvial fan wetland complex also provided groundwater recharge, flood attenuation, and water filtration. However, due to land use changes over the last century the lower reach now flows through a confined channel with reduced habitat quality and function; habitat restoration and enhancement in the lower portion of Bale Slough-Bear Creek would support recovery of Steelhead populations in the Napa River watershed.



2.1 DESCRIPTION

The goal of the undertaking is to improve salmonid and riparian habitat along Bear Creek and Bale Slough in an effort to support native steelhead trout and chinook salmon in the watershed and throughout Napa Valley. Restoration elements include channel widening, floodplain restoration, biotechnical bank stabilization, in-stream habitat features, and other improvements.

The undertaking is divided into three group within the Area of Potential Effects (APE),, Groups A, B, and C, with 14 individual restoration sites within the alignment. The objective of the restoration effort is to restore portions of approximately 7,000 linear feet of channel extending from the Bale Slough crossing at the Rutherford Cross Road to State Highway 29 and terminating in Group C west of the highway. This action will create and restore over 15 acres of wetland and riparian habitat and result in the expansion of existing wetland throughout the entire proposed alignment using a combination of restoration actions including:

- Channel widening, floodplain restoration and addition of large wood structures in Groups A, B and C
- Expansion of exisitng wetland and re-connection to floodplain area in the alluvial floodplain above Highway 29 (Group C)
- Stabilization of actively eroding banks and expansion of the riparian corridor in Groups A and B
- Agricultural berm setback in Groups A and B

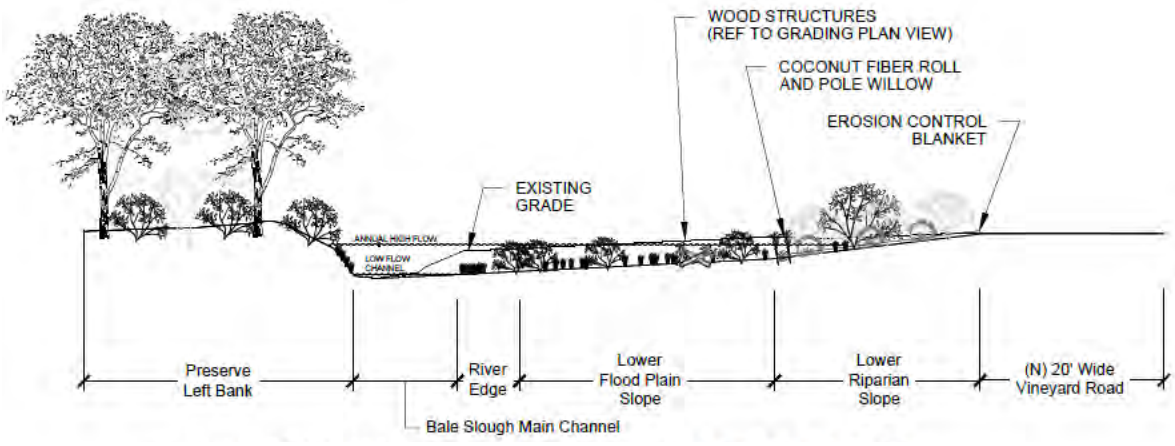
2.1A Group A

This is the lowest portion of the alignment and is just upstream of Bale Slough's confluence with the Napa River at the Rutherford Road. The slough is more deeply entrenched in this section. Widening the channel at three locations will increase the floodplain width and connectivity, reduce bank erosion and incision, protect infrastructure, and maintain the mature tree canopy to the extent possible. Linear floodplain expansion areas at two other locations in Group A are planned to provide additional floodplain area and a high flow refuge within the incised stream corridor. The channel widening will create low, frequently flooded habitat within the corridor that will also promote improved physical processes such as increased course sediment deposition of spawning sized gravels during effective discharge events. It will also provide a net expansion of the riparian corridor. The additional channel area allows the positioning of stream bed treatments that will influence in-channel geomorphic processes. The channel widening also influences the formation/maintenance of riffles at widened locations and significant contractions and formation of pools at woody debris structures. Coconut fiber roll and pole willow, at the lower riparian zone, will protect the bank from erosion along with erosion control blanket [see Typical Channel Cross Section below].

2.1B Group B

Several treatments are proposed for Group B. Invasive plant management and native re-planting are proposed for two locations to preserve the numerous mature top-of-bank valley oaks and the presence of a large irrigation pump facility at one top-of-bank location within the alignment.

Two other locations will be widened to increase flow area, encourage deposition and promote subsequent riffle formation and benthic macro invertebrate production. Another location has been designed for floodplain expansion as well. Agriculture berm setback, floodplain expansion and re-connection are proposed at another location. The addition of large woody and willow baffle structures as well as non-native vegetation management and riparian enhancement is planned for four locations..



Typical Channel Cross Section

2.1C Group C

Three improvement locations are within Group C which is located west of State Highway 29. One location is a passive floodplain enhancement project - restoration actions include removal of selected agricultural berms, and grading inlets for greater channel-floodplain interaction during flow events in order to encourage a multi-thread wet meadow habitat complex. The area immediately above State Highway 29 on along the right bank of Bear Creek undergoes fairly frequent overbank flooding. The area has a large stand of invasive Arundo that will be removed. Following restoration this area is expected to passively develop its own floodplain -wetland vegetation assemblage.

The two other improvement locations will reestablish a seasonal wetland in an area that historically contained extensive wetlands and willow complexes founded on an alluvial fan. Broad gentle depressions and braided channel geometry islands with varied topography and deeper ponding areas will be graded in order to create transitional and seasonal habitat. Willows, large wood structures and emergent and submergent wetland vegetation species will be planted in order to re-establish a native wetland vegetation assemblage. The area will also help reduce peak flows and will have a small detention effect on peak flows leaving the Bear Creek channel and its tributaries and flow into this newly created low area. Also the area is expected to provide a limited amount of groundwater recharge and extend low flow conditions into the summer. The Group C projects involve significant amounts of cut. These cut soils will be placed adjacent property and no off haul of soil will occur.

2.2 AREA OF POTENTIAL EFFECTS (APE)

The Area of Potential Effects (APE) for Archaeology includes the area within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, should any be present within the APE. The Bale Slough-Bear Creek Tributray Restoration Project horizontal and vertical APE consists of the proposed restoration elements including channel widening, floodplain restoration, biotechnical bank stabilization, in-stream habitat features and other improvements associated with improving salmonid and riparian habitat within the project alignment. The APE includes the temporary use of any existing access roads and staging areas for haulage, material laydown and storage of excavated soil. The horizontal extent of the APE ranges in width from 50-100 feet along the Group A and B slough alignments with an emphasis on the top of the south bank, the south bank, the channel and limited areas of the north bank; a large "bulb out" at the meander at the southern end of Group A at Rutherford Road; and, the irregular area that encompasses Group C. The Group A channel meander improvement area is roughly 225 feet x 200 feet (est. 1.8 acres) while the irregular Group C improvement area is 1,700 feet x 1,600 feet (44 acres). The vertical APE will range from less than one foot to 8-10 feet deep within Group A including the bulb out meander; and, three to seven feet deep within Group B. In general, Group C will be subject to some excavation ranging from two to five feet deep but the majority of the 44 acres will be filled to at least one foot. The APE is commensurate with the footprints of the various improvements within the restoration project [see Fig. 3].

3.0 REGULATORY CONTEXT

Cultural resources include prehistoric and historic archaeological sites, districts, and objects; standing historic structures, buildings, districts, and objects, and locations of important historic events or sites of traditional and/or cultural importance to various groups. The analysis of cultural resources can provide valuable information on the cultural heritage of both local and regional populations.

Cultural resources may be determined significant or potentially significant in terms of national, state, or local criteria either individually or in combination. Resource evaluation criteria are determined by the compliance requirements of a specific project.

3.1 FEDERAL

The project must comply with Section 404 of the Clean Water Act (codified at 33 U.S.C. § 1344) and the regulatory requirements of the USACE with regard to cultural resources (historic properties) for a permit.

The USACE is the NEPA responsible entity and is required to complete the federal regulatory requirements for cultural resources pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) (54 U.S.C. § 306108) and its implementing regulations 36 CFR Part 800. The regulations require a federal agency with jurisdiction over a federal, federally assisted or federally licensed undertaking to take into account the effort of the undertaking on properties listed on or eligible for the NRHP and to afford the ACHP an

opportunity to comment on the undertaking should it adversely affect a NRHP eligible or NRHP listed property. The criteria for determining NRHP eligibility are found in 36 CFR Part 60.

3.2 STATE

The District, as the lead state agency under CEQA, must determine the potential impacts of the project on both historical and unique archaeological resources and identify possible mitigation measures or alternatives that can minimize adverse impacts on any significant cultural resources that may be affected by the project.

Public agencies under CEQA must consider the effects of their actions on both "historical resources" and "unique archaeological resources." Pursuant to California Public Resources Code (PRC) Section 21084.1, a "project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment" (CEQA Guidelines Section 15064.5(b).) PRC 21083.2 requires agencies to determine whether a proposed project would have an effect on "unique" archaeological resources.

"Historical resource" (see PRC 21084.1 and CEQA Guidelines Section 15064.5(a)) includes a resource listed in or determined to be eligible for listing in the California Register of Historic Resources (CRHR). The CRHR includes resources listed in or formally determined eligible for listing in the NRHP, as well as some California State Landmarks and Points of Historical Interest.

Properties of local historic significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be "historical resources" for purposes of CEQA unless a preponderance of evidence indicates otherwise (PRC 5024.1 and CEQA Guidelines Section 15064.5(a)(2)). Unless a resource listed in a survey has been demolished or has lost substantial integrity, or there is a preponderance of evidence indicating that it is otherwise not historically or culturally significant, a lead agency should consider the resource a historical resource under CEQA.

In addition to resources listed on the CRHR or included in a local register of historical resources as defined by PRC 5020.1(k) or identified as significant in an historical resource survey meeting the requirements of PRC section 5024.1(g), the lead agency has discretion to treat an object, building, structure, site, area, place, record, or manuscript as a historical resource for CEQA purposes if the lead agency has substantial evidence showing that such a resource is historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California (PRC 21084.1 and CEQA Guidelines Section 15064.5(a)(3)). Generally, a lead agency considers a resource to be "historically significant" if the resource meets the criteria for listing on the CRHR, including the following:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

2 Is associated with the lives of persons important in our past;

3 Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or,

4. Has yielded, or may be likely to yield, information important in prehistory or history (State CEQA Guidelines Section 15064.5(a)(3)).

The fact that a resource is not listed or determined to be eligible for listing in the CRHR, or not included in a local register of historical resources (pursuant to PRC section 5020.1(k)), or identified in an historical resources survey meeting the criteria in PRC section 5024.1(g) does not preclude a lead agency from determining that the resource may be a historical resource (PRC 21084.1 and CEQA Guidelines Section 15064.5(a)(4)).

CEQA also distinguishes between two classes of archaeological resources: archaeological sites that meet the definition of a historical resource, as described above, and "unique archaeological resources." Under CEQA, an archaeological resource is considered "unique" if it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that the resource meets any of the following criteria:

> Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
>
> Has a special and particular quality such as being the oldest of its type or the best available example of its type; or,
>
> Is directly associated with a scientifically recognized important prehistoric or historic event or person (PRC 21083.2(g)).

CEQA states that if a proposed project would result in an impact that might cause a substantial adverse change in the significance of a historical resource, then an EIR must be prepared and mitigation measures considered. A "substantial adverse change" in the significance of a historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired (CEQA Guidelines Section 15064.5(b)(1)).

The CEQA Guidelines (Section 15064.5(c)) also provide specific guidance on the treatment of archaeological resources, depending on whether they meet the definition of a historical resource or a unique archaeological resource. If the site is not a historical resources, but meets the definition of a unique archaeological resource, it must be treated in accordance with the provisions of PRC 21083.2. PRC Section 21083.2 states that if it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts to be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. Examples of that treatment, in no order of preference, may include, but are not limited to:

(1) Planning construction to avoid archaeological sites.

(2) Deeding archaeological sites into permanent conservation easements.

(3) Capping or covering archaeological sites with a layer of soil before building on the sites.

(4) Planning parks, greenspace, or other open space to incorporate archaeological sites.

When an archaeological resource is listed in or is eligible to be listed in the CRHR, PRC Section 21084.1 controls, and it states that "[a] project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." PRC Sections 21083.2 and 21084.1 operate independently to ensure that potential effects on archaeological resources are considered as part of a project's environmental analysis.

Tribal Resources

Assembly Bill 52 (AB 52) provides protections for tribal cultural resources.[1] All lead agencies issuing a notice of preparation or a notice of negative declaration or mitigated negative declaration on or after July 1, 2015, are required, if formally requested by a culturally affiliated California Native American Tribe, to consult with such tribe regarding the impacts of a project on tribal cultural resources prior to the release of any negative declaration, mitigated negative declaration or draft environmental impact report. Under PRC Section 21074, tribal cultural resources include site features, places, cultural landscapes, sacred places or objects that are of cultural value to a tribe that are eligible or listed on the CRHR or a local historic register or that the lead agency has determined to be a significant tribal cultural resource.

Tribal consultation is to continue until mitigation measures are agreed to or either the tribe or the lead agency concludes in good faith that an agreement cannot be reached. In the case of agreement, the lead agency is required to include the mitigation measures in the environmental document along with the related Mitigation Monitoring and Reporting Program (MMRP). If no agreement is reached, the lead agency must still impose all feasible mitigation measures necessary for a project to avoid or minimize significant adverse impacts on tribal cultural resources (PRC Section 21084.3).

Other California Laws and Regulations

Other state-level requirements for cultural resources management appear in the California PRC Chapter 1.7, Section 5097.5 "Archaeological, Paleontological, and Historical Sites," and Chapter 1.75 beginning at Section 5097.9 "Native American Historical, Cultural, and Sacred Sites" for lands owned by the state or a state agency.

The disposition of Native American burials is governed by Section 7050.5 of the California Health and Safety Code and PRC Sections 5097.94 and 5097.98, and falls within the jurisdiction of the Native American Heritage Commission.

1. AB 52 amended Section 5097.94 of, and added Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3 to, the California Public Resources Code

4.0 BACKGROUND CONTEXT

4.1 ENVIRONMENTAL SETTING

The study area is located just to the west of the Napa River the major drainage system of the Napa Valley which flows southerly discharge into Mare Island Strait in the vicinity of Vallejo. The Napa River drainage basins covers 426 square miles with numerous creeks and seasonal drainages present including Bale Slough which terminates at the south end of the project alignment. The APE is within the Mid-Valley: Oakville, Rutherford, St. Helena (see Grossinger 2012:171).

The Napa Valley is included in the southeastern corner of the northern Coast Ranges and within Upper Sonoran life-zone. The humid Mesothermal climate is characterized by winter rainfall and the warmest monthly average temperature is below 71°F (Heizer 1953; Grinnell 1935; Carpenter and Crosby 1938; Jenkins 1941).

Project area elevation varies from approximately 162 to 142 feet above sea level north to south along the APE (USGS 1973). The general project vicinity consists of a floodplain and older floodplain terraces, former freshwater marshlands with low-lying mountains to the west. Bale Slough is one of eight large freshwater marshes greater than 10 acres noted during surveys in the mid-18th century and occurred in a coalescing alluvial fan. An estimated 300 acres of freshwater tule marsh received overflow from several creeks. Portions of the APE area is also partially characterized by historic wet meadows. The area has been subject to various drainage methods to allow land reclamation for agriculture (see Grossinger 2012). .

The Mid-Valley area has a complex ecological pattern due to topographic complexity and is characterized by oak savannas, riparian forests and valley wetlands (see Kuchler 1977; Grossinger 2012).

Major native soils include Maxwell clay west of State Route 129, Clear Lake clay (overwashed) in the northern alignment east of the highway and Cole silt loam within the remainder of the alignment south to Route 128. Yolo loam is present within a small portion of the southern alignment along the slough near State Route 128 (USDA/SCS 1978). .

4.2 NATIVE AMERICAN

4.2A Prehistoric

Cultural resources are traces of human occupation and activity. In northern California, human occupation extends back in time for at least 9,000-11,500 years with Native American occupation and use of the general Bay Area extending over 5,000-8,000 years and possibly longer. The study area lies within the central portion of the northern Coast Ranges of California and the pre-historic context is defined in part by the region's unique geography. Archaeological information suggests an increase in the prehistoric population over time with an increasing focus on permanent settlements with large populations in later periods. This change from hunter-collectors to an increased sedentary lifestyle is due to more efficient resource procurement but with a focus on staple food exploitation, the increased ability to store food at village locations,

and the development of increasing complex social and political systems including long-distance trade networks (Heizer 1953; Bennyhoff 1994:51; Bennyhoff and Fredrickson 1994).

The project area was within an environmentally advantageous area for Native Americans during the prehistoric period prior to white contact. Prehistoric use of the general area was heavily influenced by the presence of the Napa River and various seasonal creeks and associated fresh water marshes. Local creeks would have provided a year-round source of water and riparian resources. In addition, travel would have been relatively easy between the valley, bay shoreline to the south and interior foothill ranges. The foothills would have provided access to acorns, seed, game, tool stone, etc. while the bay and its margins along with the many perennial and seasonal creeks and sloughs would have been sources of shellfish, fish, waterfowl, and riparian vegetation.

Prehistoric site types in the general project area include habitation sites ranging from villages to temporary campsites, stone tool and other manufacturing areas, quarries for tool stone procurement, cemeteries usually associated with large villages, isolated burial sites, rock art locations, bedrock mortars or other milling feature sites and trails. Archaeological sites in the general area appear to have been selected for relative accessibility, protection from seasonal flooding, and proximity to a diversified resource base.

Archaeological research in the general San Francisco Bay Region has been interpreted using several chronological schemes based on stratigraphic differences and cultural traits. The initial classification sequence used three horizons, Early, Middle and Late, to designate both chronological periods and social change based on stratigraphic patterns and an analysis of grave goods to explain local and regional cultural change from about 4,500 years ago to European contact (see Moratto 1984). This classification scheme has been revised although the prior nomenclature (Early, Middle, Late Horizon) is still in common use (see Fredrickson 1994a-b). In regard to the North Coast Ranges Fredrickson (1973, 1974) proposed a tripartite scheme - Archaic, Emergent and Ethnographic - each with subdivisions, appropriate characteristics and chronological ranges.

> **Lower Archaic Period** (8,000 to 5,000 B.P.) – early period coeval with mid-Holocene climatic change to generally drier conditions and desiccation of pluvial lakes. Characterized by semi-sedentary settlement with a focus on gathering rather than hunting. Typical artifact types included large dart points and presence of metates (milling slabs) and manos (hand stones). Obsidian from Napa sources appear to have been traded to other areas of the Bay Area.
>
> **Middle Archaic Period** (5,000 to 3,000 B.P.) – climate similar to present conditions with cultural changes from Lower Archaic Period likely driven by changing environmental regime. Subsistence economy diversified and probably included introduction of acorn collection and processing with hunting remaining an important source of food. General population growth and expansion with possible long-term residential villages. Trade does not appear to be regular but obsidian from Napa sources appear to have been traded to other areas of the Bay Area.. Diagnostic artifacts include

the introduction of the bowl mortar and pestle and the continued use of large projectile points although side-notched and stemmed points are also present.

Upper Archaic Period (3,000 to 1,500 B.P.) - growth of sociopolitical complexity readily apparent. Development of status based on wealth present. Complex exchange systems with evidence of regular sustained exchanges between groups. Shell beads gained in significance as possible indicators of personal status and as important trade items. General population growth and expansion with a focus on long-term residential villages. During this period, large projectile points are still found in lithic assemblages along with side-notched and stemmed points, and the bowl mortar and pestle replaced the milling stone and hand stone throughout most of the state.

Emergent Period (500 to 200 B.P.) – marked by several technological and social changes including the introduction of the bow and arrow. Territorial boundaries between groups became well established and closely resemble the ethnographic record, Social status linked to acquired material wealth. Exchange of goods between groups becomes more regularized with more material, including raw materials, entering into the exchange networks. Napa Valley obsidian dominates chipped stone assemblages the surrounding Bay Area and other areas.

In the latter portion of this period, exchange relations become highly regularized and sophisticated. Craft specialization are present appear to have governed various aspects of production and exchange of trade goods. Bedrock mortar milling stations appear early in the Emergent Period and are used in association with other portable milling equipment. Nuts, berries and seeds, especially small seeds, were collected and processed. Large terrestrial mammals (e.g., deer, elk) appear to have been favored. Marine shellfish and marine fishes appear inland in much larger quantities than in previous periods.

General overviews and perspectives on the regional prehistory including chronological sequences can be found in Moratto (1984), Heizer (1953), Fredrickson (1973, 1974, 1994a-b) Elsasser (1978) and Jones and Klar (2007).

4.2B Ethnographic

The APE is located within the ethnographic and historic boundary of the northern portion of the *Southern Wappo* (Barrett 1908; Kroeber 1925; Heizer 1953; see Sawyer 1978; Milliken 1978 Map 3). Milliken (1978, 1995) shows the project in *Canijolmano* tribal territory and later as Rutherford/*Canijolmano* (after the predominant rancheria in the area).[2] The *Canijolmano* were affected by the mission system as documented in mission records of Mission San Francisco Solano and Mission San Francisco (Mission Dolores), (Milliken 1995, 2006).

The Wappo language and Northern Yukian are distinct languages within the Yukian family (Golla 2007) with the various Wappo dialects mutually intelligible. Two language division have been identified. One division is found within a five-square-mile territory south of Clear Lake

2. The *Callajolmanas* lived on the Bale ranch near St. Helena. They "may be the same as the people of annakō'tanoma" (Barrett 1908).

and the larger division - including the Western, Northern, Central and Southern subdivisions - extended from just north of Napa and Sonoma in the south to Cloverdale and Middletown in the north (Heizer 1953; Sawyer 1978).

None of the known Wappo settlements or camps were located in or adjacent to the APE. Villages were usually located on a creek or near other sources of water and included one or two sweathouses" (Sawyer 1978). The closest known permanent village, *Annakótanom*a – the bull-snake village, was located southeast of present-day St. Helena, south of Sulpher Creek (Sulphur), and east of the Napa River. The other permanent village near the Napa River in Southern Wappo territory, *Kaîmusm,* was located northwest of Yountville. The closest known "Indian trail" was in the vicinity of present-day Zinfandel, approximately two miles north of present-day Rutherford **(**Barrett 1908; Heizer 1953:Maps 1-2).

George Calvert Yount (1794-1865), namesake of Yountville south of the project area, estimated that there were 8,000 Native Americans in the Napa Valley that included one Miwok and four Wappo groups (Sawyer 1978; Hart 1987). By 1823, the population of the Wappo had diminished and lifeway disrupted so that they established rancherias (settlements) on the grants of the early settlers, in order to gain a livelihood by occasional labor. In 1843 their numbers were approximately 3,000 Wappo and Wintun with an estimated 50-100 Wappo within the Bale Rancho (north of the APE) and another 400 Wappo on the *Caymus Rancho* [Kaimus] (which includes the APE). By 1855 Yount estimated no more than 500 Wappo were still present within the Napa Valley (see Menefee 1873; Kroeber 1925; Sawyer 1978).

Additional information about the Wappo including language, territory, history, and nonmaterial as well as material culture are found in Kroeber (1925, 1932), Driver (1936), Heizer (1953), Cook (1956), Sawyer (1978) and Milliken (1978, 1995, 2006).

4.3 HISTORIC PERIOD

The history of the general project area can be divided into the Hispanic Period (Spanish Period 1769-1821 and the Mexican Period 1822-1848), and, the American Period (1848-onward). During the Hispanic Period, Spanish government policy in northwestern New Spain was directed at the founding of presidios (forts), missions, and pueblos (secular towns) with the land held by the Crown whereas later Mexican policy (1822-1846) stressed individual ownership of the land with grants of vast tracts of land to individual citizens (Hart 1987). The American Period focused on development and growth - a pattern that continues into the 21st Century.

4.3A Hispanic Era (1769-1848)

In June 1823, Francisco Castro, accompanied by Ensign Alferez José Sánchez and Father José Altimira, led an expedition through the study area in response to Russian encroachment. As a result, the Napa area was selected for a mission cattle ranch (an outstation of Mission Dolores) and Sonoma was selected as the location for Mission San Francisco Solano. The mission, founded on July 4, 1823, was the last mission built in California (Greengo and Shulter 1953; Hoover et al. 1966; Beck and Haase 1974:#18-19; Weber 1998).

The Mexican War of Independence, from 1810 to 1821, resulted in Mexico separating from Spain. During the Mexican Period, rapid secularization of the Spanish mission system occurred. Between 1835 and 1836 the Mexican government began offering grants of Mission grazing land primarily to Californios (both Spanish speaking descendants of European settlers, and Mestizo and Europeanized Natives) and Mexican colonists. In 1836, the missions had closed freeing the Indian neophytes to return to their villages, or work as wage-labor on the newly granted ranchos. By 1845, the last of the mission land holdings had been relinquished, opening the way for the large ranchos common to California in the mid-1800s. The dominant land-use of the ranchos was livestock grazing and some farming.

Mariano Guadalupe Vallejo had a major impact on the Napa region during the Mexican Period. In 1833 he was dispatched to the northern frontier to select a presidio site and inspect the Russian settlement at Ross. The following year, 1834 he was granted *Rancho Petaluma*; in 1835 he founded the *Pueblo of Sonoma* and was made military commander and director of colonization; and, in 1836 he was appointed commandant general of California. In 1843, Vallejo was granted *Rancho Suscol* (south of the project APE adjacent to part of *Rancho Tulucay* and extending into Solano County) and his original *Rancho Petaluma* grant was expanded.

Vallejo was preeminent in campaigns against the Native peoples and fostered ill and warfare between various native groups as part of his policy (Greengo and Shulter 1953; McClellan 1953; Perez 1996). The Battle of Suscol on December 27, 1840 resulted in the deaths of 34 Native Americans who were massing for a battle presumably with the garrison in Sonoma. Vallejo was reportedly assisted by George C. Yount, who arrived in 1833 in Sonoma/Sonoma Valley. Yount, the first American to settle in the Napa Valley, was granted the *Caymus Rancho* in 1836. In addition to the 34 deaths, a number of Native Americans were captured at *Las Trancas* (now known as Suscol).

The project APE and vicinity are within the former *Rancho Caymus*, granted to George C.. Yount on February 23, 1836 by Governor Gutierrez. The grant, in about the center of the Napa Valley. included both sides of the Napa River and present-day towns of Rutherford and Oakville about 1.5 mile to the south and Yountville on its southern boundary. It was patented to him on April 3, 1863 for 11,814.52 acres. None of the known Hispanic era dwellings, features, roads, and other features associated with the rancho have been identified in or adjacent to the project APE (see Heizer 1953:231-232; Hendry and Bowman 1940:365-369a; Hoover et al. 1966:239-240; Weber 1998).

The adjacent *Rancho Carne Humana* contiguous to the northern boundary of *Rancho Caymus* includes present-day St. Helena and Calistoga. This rancho was granted in fee in March 1841 to Edward Turner Bale (1811-1849), namesake of Bale Slough, an English ship physician/surgeon who came to Monterey in 1829. He practiced medicine for five or six years and he was surgeon of the California forces by appointment of General Vallejo from 1840-1843. A naturalized citizen of Alta California, he moved with his wife, Maria Ignacia Soberanes, a niece of General

Vallejo, to his rancho in 1843.[3] *Rancho Carne Humana* was patented to his heirs in September 1879 (Hendry and Bowman 1940:355-358, map; Hoover et al. 1966:240-243; USGS 1980).

4.3B American Period (1848-Contemporary)

In the mid-19th century, most of the rancho and pueblo lands in California were subdivided as the result of population growth, the American takeover and the confirmation of property titles. The initial explosion in population was associated with the Gold Rush (1848), followed later by the construction of the transcontinental railroad (1869). Still later, the development of the refrigerator railroad car (ca. 1880s) used for the transport of agricultural produce to distant markets had a major impact on population growth. The growth of the general project area was dependent on ranching/farming, salt production and transportation - first by water and roads during the Hispanic era and later, by rail and then by air (Hart 1987).

In 1848, California became a United States territory as a result of the Treaty of Guadalupe Hidalgo which ended the war with Mexico. California was formally admitted as a state in 1850. The Gold Rush in the same year brought a massive influx of immigrants to California from all parts of the world. California's 1848 population of less than 14,000 (exclusive of Indians) increased to 224,000 within four years. As many of these new immigrants became discouraged with gold mining, they sought a more stable livelihood as farmers and ranchers. The new increase in population also created a domestic market for agricultural products that had never existed before. Once the owners of the Mexican ranches obtained clear title to their land, they typically sold off parcels to the newcomers who started farms and ranches.

Growth in the general project study area has been linked to factors such as the availability of land, agricultural productivity, mining, and access to major markets including San Francisco and Sacramento by water and, later, by railroad. Napa County was one of the original 27 State of California counties established and redefined in 1851. Napa City, "Nappa City" and/or the City of Napa, located in the northeast part of former *Rancho Entre Napa*, has always been the county seat. The earliest improved road, laid out in 1851-1852 ran through the center of the Napa Valley northwest from the Napa River landing at Soscol north through Napa City and onward. Unfortunately winter flooding necessitated a new alignment on higher ground on the eastern side of the valley known since the 1940s as the “Silverado Trail” (King 1967; Page & Turnbull 2009). By far the viticulture industry has been pre-eminent in the Napa Valley with a world-wide reputation for the production of premier wines. Extractive industries - lumber and mining – have also been important Napa Valley industries in the past (e.g., Hoover et al. 1966:245-246; King 1967:48-53; 55-58; Weber 1998:214-260).

The City of Napa, the navigational head of Napa Creek, was the focus of settlement and commerce and a transportation center in the lower Napa Valley. The pioneer center of what was to become the City of Napa is approximately 14.0 miles south of the project APE in the northeast

3. The Bale Adobe Dwelling site was located on Whitehill Lane two miles south of St. Helena. He commissioned two mills on his property, a sawmill and a gristmill, both in 1846. The flour mill, built three miles northwest of St. Helena, is a State of California Landmark #359 (Old Bale Mill at 3369 N. St. Helena Highway) (Hendry and Bowman 1940; Hoover et al. 1966:240-241; King 1967:29l CAL/OHP 1990:131; Hart 1987:31).

corner of the *Rancho Entre Napa* which had been sold in 1848 to Nathan Coombs, founder of the future City of Napa. News of the discovery of gold in California reached Napa City on May 8, 1848 leading to the construction of numerous temporary buildings in the fall and winter of 1848-1849 with a ferry established by William Russell and a partner. The importance of Napa City as a commercial and transportation center as the gateway to the Napa Valley is underscored by the presence of post office prior to April 1850 (Coy 1973; Menefee 1873; Hoover et al. 1966; Patera 1991).

Rutherford in the mid-Valley is the closest settlement to the project APE, approximately 3000 feet from the southern end of the APE which terminates just north of Rutherford Road / Highway 128 east to the intersection of Rutherford Road and Highway 29/Saint Helena Highway. Rutherford Road connects Highway 29/Saint Helena Highway on the west with the Silverado Trail on the east side of the Napa Valley. The Napa Valley Railroad Company (NVRR) Rutherford station [see below], the settlement focused on the station, and post office - established September 25, 1871 - were named in honor of Thomas L. Rutherford, a grower and producer of high-quality wines in the late 1800s**.** The name "Rutherford" was in use prior to the arrival of the railroad as a result of George C. Yount's 1,040-acre wedding gift of part of his *Rancho Caymus* to Rutherford and Elizabeth ("Lillie"), his granddaughter, in 1864 (Hendry and Bowman 1940:[map of] Napa County; Patera 1991:185; Gudde 1998:324; Weber 1998:121). Even though the NVRR construction to Calistoga was completed in 1867, Rutherford does not merit inclusion in Menefee (1873). See Weber (1998) for more information about the *Old Napa Valley.*

The NVRR alignment is formally recorded as P-28-000966 (CA-NAP-1113H) (Germano and Stewart 2006a-b/form) with part within the Napa Valley Railroad District / Napa Valley Wine Train as P-28-001547 (Germano 2006/form). In addition, the San Francisco Napa and Calistoga Electric RY [railway; SFNC] ran on the west side of the Highway 29 / St. Helena Highway. The SFNC was incorporated in 1911 to purchase the San Francisco, Vallejo & Napa Valley Railroad. The latter was a successor of the San Francisco, Vallejo & Napa Valley Electric Railway & Steamship Company, incorporated in June 1906 and opened to Yountville approximately 5.0 miles south of the APE on September 1907. The SFNC was reorganized as the San Francisco & Napa Valley Railroad Company (SFNV) on September 3, 1935 and abandoned in 1956 and dissolved as a corporation on September 15, 1957 (USCOE 1915; 1942; Fickewirth 1992:127-128, 130; Robertson 1998:207-208).

Viticulture has remained the dominant agricultural activity in the Napa Valley with fruit growing an important secondary crop. Tourism is the primary non-agricultural industry followed by goods and services associated with the two main activities.

Summary Historic Map Review

For the most part, the APE and general project area have been within a sparsely developed landscape dedicated to agriculture, especially viticulture.

> Goddard's 1857 *Britton & Rey's Map of the State of California* shows a road up the valley on the east side of "Napa C [Creek/River] with "Yount" and "Ritchie" further north. Even though Bale moved to his rancho in 1843 his location is not shown (Hart 1987:31 [Bale]).

A 1853-1868 General Land Office (GLO) *Survey Plat* for Township No. 7 North, Range No. 5 West shows the project APE within "Lot No. 37" of "Part of .Caymus Rancho" as well as the "Napa River" and "Yountsville" straddling the southern boundary (USBLM/GLO 1853-1868).

A schematic map of *Mid-Valley Wineries* in 1881 shows the alignment of the "County Road" – the precursor to Highway 29 / St. Helena Highway - at a short distance (e.g., not parallel) to the west of the railroad (Weber 1998:248).

An 1887 Map of Napa County is limited to towns/stations along the Napa Valley Railroad and various valleys in Napa County as well as proposed rail road route to Lake County on the east side of the Napa River (Napa County Board of Supervisors 1887).

The USGS 1902 Napa topographic map shows Rutherford and Rutherford Road crossing the county road / Highway 29 / St. Helena Highway and then "Southern Pacific R. R. (Calistoga Branch)." The alignments of Bale Slough and Bear Creek , as well as the Napa River are shown. Bale Slough is east of the Highway 29 / St. Helena Highway on both the 1902 Napa and 1915 Sonoma USCOE quadrangles. The 1915 quadrangle shows the "Southern Pacific R.R." (SP) on the west side of the highway and the "San Francisco Napa and Calistoga Electric RY" [railway; SFNC] on the west side of the SP. The 1942 USCOE Sonoma quadrangle is similar in that the SP and the SFNC are shown, but the SP is mapped on the east side of the highway and the SFNC is closer to the highway on the west side of the highway.

The 1902 USGS Napa and 1915 USCOE Sonoma quadrangles are similar as to a straight line configuration of Bale Slough on the east side of the highway. The southern part of which is shown as an intermittent channel on the 1973 USGS Rutherford topographic quadrangle. By 1942 the alignment of Bale Slough was irregular in contrast to the former channel; Bale Slough and Bear Creek bifurcate east of highway. The 1942 USCOE Sonoma quadrangle, unlike the 1902, 1915 and 1973 quadrangles shows an unpaved road north from Rutherford Road crossing the Bale Slough APE just west of the Napa River and the alignment of Bale Slough as irregular (in contrast to the former straight channel in 1902, 1915). The 1942 USCOE quadrangle shows Bale Slough and Bear Creek bifurcating east of the highway unlike the 1915 and 1973 quadrangles. Part of the irregular alignment of Bale Slough near Rutherford Road is shown on the 1973 quadrangle along with a channel with a sharp curve east of the highway. By 1973, an unnamed intermittent flow north of Bale Slough, Bale Slough, and Bear Creek merge just west of the highway, a configuration that conforms to the present-day. Vegetation as shown on the quadrangles varies and is obscured on the available USGS 1902 and is not apparent on the USCOE 1942 quadrangles. The USCOE 1915 shows mostly orchard with a small part of a vineyard on the east side of the highway and row crops on the west side while the USGS 1973 shows vineyard and a small portion of orchard on the west side of Group A and an orchard on the south side of Bale Slough west of the highway and flanking Bear Creek within Group C. Note that contemporary aerials show portions of a riparian corridor along the APE (ESA 2019).

5.0 RESEARCH PROTOCOLS

A prehistoric and historic site records and literature search for a 0.25 mile radius from the APE was completed by the California Historical Resources Information System, Northwest Information Center, Sonoma State University (CHRIS/NWIC File No. 20-0072, dated 8/14/20 by Neal). Reference material from the Bancroft Library at the University of California, Berkeley, Basin Research Associates, San Leandro and available on the web was also consulted. Sources included:

National Register of Historic Places listings for Napa County, California (USNPS 2017-2019);

OHP Built Environment Resources Directory [BERD] (CAL/OHP 2020a).

Listed California Historical Resources (CAL/OHP 2020b) with the most recent updates of the National Register of Historic Places; California Historical Landmarks; and, California Points of Historical Interest as well as other evaluations of properties reviewed by the State of California Office of Historic Preservation;

California History Plan (CAL/OHP 1973);

California Inventory of Historic Resources (CAL/OHP 1976);

Five Views: An Ethnic Sites Survey for California (CAL/OHP 1988);

Archaeological Determinations of Eligibility (CAL/OHP 2020c); and,

Other regional/local lists and maps (see References Cited and Consulted).

The Native American Heritage Commission (NAHC) was contacted for a review of the Sacred Lands Inventory (SLF) (Busby 2020a). Letters and/or emails were sent to the six locally knowledgeable Native American individuals/organizations identified by the NAHC (Fonseca 2020; Busby 2020b-h). No responses were received. Additional outreach was made to the Mishewal-Wappo Tribe of Alexander Valley as they were referenced by the NAHC as having information on the positive resources listed on the SLF (see Attachments).

No other agencies, departments or local historical societies were contacted regarding landmarks, potential historic sites or structures.

Mr. Christopher Canzonieri (MA, RPA) completed an archaeological field review of the project APE on July 22-23, 2020 with a supplemental field inventory June 15, 2021 of the expanded APE in Group C. In addition to the surface inventories, a focused backhoe presence/absence testing program was completed December 8-9, 2020 within the Group A APE. The testing program was undertaken to determine the presence/absence of significant subsurface archaeological materials within the APE along the south bank of Bale Slough.

5.1 RECORDS SEARCH RESULTS

Twenty-one (21) reports are on file with the CHRIS/NWIC that include the APE or immediately adjacent areas. An additional 17 studies are within 0.25 mile of the APE (see Table 5.1).

Six prehistoric sites, one historic building/structure, and one historic district are within or adjacent to the project APE. None of the prehistoric resources appear eligible for the NRHP and CRHR. The historic resources are not eligible. Six prehistoric sites, one multicomponent site, and one historic building are within 0.25 mile of the APE (see Table 5.2).

5.1A Group A

One recorded resource (P-28-00136 / CA-NAP-144) is within the APE on the south bank of Bale Slough while one resource (P-28-000470 / CA-NAP-588) is adjacent to the APE on the north bank of the channel.

TABLE 5.1
STUDIES WITHIN/ADJACENT TO OR WITHIN 0.25 MILE OF THE APE

Report #	Author	Date	Title	Study Type	Comments	Resources In/Adjacent
In or Adjacent to APE						
S-002483	Katherine Flynn	1981	Archaeological reconnaissance of a 60 acre vineyard parcel located at 1695 St. Helena Highway (letter report)	Archaeological, Field study	P-28-000471 (CA-NAP-589) within 0.25 mile of project	P-28-000472 (CA-NAP-590) P-28-000473 (CA-NAP-591) P-28-000474 (CA-NAP-592) P-28-000475 (CA-NAP-593)
S-002505	Katherine Flynn	1981	Archaeological survey, Beaulieu Vineyard, Rutherford, California (Se No. 7973) (letter report)	Archaeological, Field study	P-28-000469 (CA-NAP-587) within 0.25 mile of project	P-28-000470 (CA-NAP-588)
S-002505a	Katherine Flynn	1982	Archaeological monitoring activity during industrial wastewater pipeline excavation, Beaulieu Vineyards (letter report)	Archaeological, Field study, Monitoring	P-28-000469 (CA-NAP-587) within 0.25 mile of project	P-28-000470 (CA-NAP-588)
S-002574	Margaret Duddy	1981	Archaeological reconnaissance of the San Mateo Ranch Expansion, Rutherford, California (letter report)	Archaeological, Field study	Negative	None
S-007618	Gregory King, Pat Oman, Margaret Buss, Denise O'Connor, Daryl Noble, Terry Schuster, and John Snyder	1986	Historic Properties Survey Report, Proposed Shoulder Widening and Installation of Left Turn Lanes Along St. Helena Highway, Napa County, 4-NAP-29 22.2/28.4 04226-111330	Architectural/ historical, Field study	P-28-000585 (CA-NAP-710/H) within 0.25 mile; Numerous other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547
S-007618a	Pat Oman	1985	Archaeological Survey Report for Widening and Left-Turn Channelization to Highway 29 in Napa County, 4-NAP-29 22.2/28.4 04226-111330	Archaeological, Field study	P-28-000585 (CA-NAP-710/H) within 0.25 mile; Numerous other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547
S-007618b	Denise O'Connor and Gregory King	1986	Historical Architectural Survey Report for a Widening Project on Highway 29 from Oakville to St. Helena, Napa County, 4-NAP-29 22.2/28.4 04226-111330	Architectural/ historical, Field study	P-28-000585 (CA-NAP-710/H) within 0.25 mile; Numerous other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547

TABLE 5.1, con't
STUDIES WITHIN/ADJACENT TO OR WITHIN 0.25 MILE OF THE APE

Report #	Author	Date	Title	Study Type	Comments	Resources In/Adjacent
In or Adjacent to APE, con't						
S-007618c	Gregory King	1985	Historic Resource Evaluation Report on Historic Debris Located in the Oakville Vicinity, Napa County, 4-NAP-29 22.2/28.4 04226-111330	Architectural/ historical, Evaluation	P-28-000585 (CA-NAP-710/H) within 0.25 mile; Numerous other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547
S-007618d	Gregory King	1986	Historic Resource Evaluation Report on Former Napa Valley Railroad Line, 4-NAP-29 22.2/28.4 04226-111330	Architectural/ historical, Field study	P-28-000585 (CA-NAP-710/H) within 0.25 mile; Numerous other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547
S-007618e	Mick Hayes	1990	Negative Archaeological Survey Report: Addendum #1, for Widening and Left-Turn Channelization to Highway 29 in Napa County	Archaeological, Field study	P-28-000585 (CA-NAP-710/H) within 0.25 mile; Numerous other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547
S-007618f	Glenn Gmoser	1990	Negative Archaeological Survey Report: Addendum #2, for Widening and Left-Turn Channelization to Highway 29 in Napa County	Archaeological, Field study	P-28-000585 (CA-NAP-710/H) within 0.25 mile; Numerous other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547
S-007618g	Steven J. Rossa	1992	Negative Archaeological Survey Report: Addendum #4, for Widening and Left-Turn Channelization to Highway 29 in Napa County	Archaeological, Field study	P-28-000585 (CA-NAP-710/H) within 0.25 mile; Numerous other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547
S-007618h	Gregory King	1987	Oakville and Its Store	Architectural/ historical, Other research	P-28-000585 (CA-NAP-710/H) within 0.25 mile; Numerous other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547
S-007618i	Kathryn Gualtieri, Thomas F. McDonnell, and Richard T. Fitzgerald	1991	FHWA861015A; 4-NAP-29 22.2/28.4	OHP Correspondence	P-28-000585 (CA-NAP-710/H) within 0.25 mile; Numerous other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547
S-007618j		1990	No Effect Determination, FAP 29, 04-Nap-29-21.2/28.4	Archaeological, Architectural/ historical, Management/ planning	P-28-000585 (CA-NAP-710/H) within 0.25 mile; Numerous other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547

TABLE 5.1, con't
STUDIES WITHIN/ADJACENT TO OR WITHIN 0.25 MILE OF THE APE

Report #	Author	Date	Title	Study Type	Comments	Resources In/Adjacent
In or Adjacent to APE, con't						
S-011723	Patricia A. Ryan and Roger H. Werner	1990	Cultural Resource Survey of the Proposed Grgich Hills Winery Expansion, Napa, Napa County, California	Archaeological, Field study	Negative	None
S-014658	Katherine S. Flynn	1992	A Cultural Resources Evaluation of the Lands of Pestoni et. al., dba Upper Valley Disposal Service, St. Helena, Napa County, CA	Archaeological, Field study	Negative	None
S-016881	Katherine Flynn	1988	Archaeological survey of the Inniskillin Winery property near Rutherford, Napa County, California (letter report)	Archaeological, Field study	Negative	None
S-021260	Kim J. Tremaine and John A. Lopez	1998	Rock Fences of Napa County: A Pilot Study	Architectural/ historical, Field study	Numerous resources outside of the project vicinity	None
S-033511	Laura Leach-Palm, Patricia Mikkelsen, Jerome King, Paul Brandy, Lindsay Hartman, and Bryan Larson	2007	Cultural Resources Inventory of Caltrans District 4 Rural Conventional Highways in Alameda, Marin, Napa, San Mateo, Santa Clara, and Sonoma Counties	Archaeological, Architectural/ historical, Field study	P-28-000137 (CA-NAP-145) P-28-000585 (CA-NAP-710/H) P-28-000999 within 0.25 mile; Numerous other resources outside of the project vicinity	None
S-034467	Jay M. Flaherty	2006	Cultural Resource Reconnaissance of 24+/- Acres Near Rutherford, Napa County, California (Rutherford Winery APN 030-100-003)	Archaeological, Field study	Negative	None
S-036250	Eileen Barrow and Thomas M. Origer	2009	A Cultural Resources Survey for the Proposed Grgich Hills Cellar Project, 1829 St. Helena Highway, Napa County, California	Archaeological, Field study	Negative	None
Within 0.25 mile of APE						
S-001631	William E. Soule	1979	Archaeological Survey Report, Application 24918, of the Hewitt Property, Napa County, California (California Division of Water Rights)	Archaeological, Field study	One resource outside of the project vicinity	None
S-002392	Katherine Flynn	1979	Archaeological reconnaissance of a proposed lath house site, Montandon-Wilsey residence, Rutherford, California (letter report)	Archaeological, Field study	P-28-000828 (CA-NAP-32) within 0.25 mile of the project	None
S-004917	Katherine Flynn	1982	Archaeological survey of 3 acre parcel, APN 30-150-15, proposed Ritchie residence, Rutherford Cross Road east of Napa River (letter report)	Archaeological, Field study	Negative	None
S-009424	John Holson and Richard Fitzgerald	1987	Phase I Extended Archaeological Survey Report for CA-NAP-710/H, the Galleron Site at 04-NAP-29 P.M. 25.55 and 25.70 04226-111330, Final Report	Archaeological, Excavation, Field study	P-28-000585 (CA-NAP-710/H) within 0.25 mile of the project	None
S-009424a	Katherine M. Dowdall	1990	Phase II Archaeological Excavation Report for CA-NAP-710/H, The Galleron Site at 04-NAP-29 P.M. 25.55 and 25.70 04226-111330	Archaeological, Excavation	P-28-000585 (CA-NAP-710/H) within 0.25 mile of the project	None

TABLE 5.1, con't
STUDIES WITHIN/ADJACENT TO OR WITHIN 0.25 MILE OF THE APE

Report #	Author	Date	Title	Study Type	Comments	Resources In/Adjacent
Within 0.25 mile of APE, con't						
S-012739	Milton W. Stoll, Jr.	1960	Napa Valley Archaeological Survey	Archaeological, Field study	P-28-000137 (CA-NAP-145) P-28-000828 (CA-NAP-32) within 0.25 mile; Numerous resources outside of the project vicinity	P-28-000136 (CA-NAP-144)
S-031236	James Roscoe and William Rich	2005	A Cultural Resources Investigation of the Rutherford Dust Society Arundo Eradication and Riparian Restoration Project, Located in Napa County, California, DFG #072-R3	Archaeological, Field study	P-28-000828 (CA-NAP-32) within 0.25 mile; Three other resources outside of the project vicinity	None
S-034210	Carie Montero	2006	Historic Property Survey Report for the Route 29 Saint Helena Left-Turn Channelization and Road Rehabilitation Project in Napa County, California, 04-NAP-29, PM 25.5/28.4 (KP 41.0/45.7), EA 259400	Archaeological, Architectural/ historical, Field study	P-28-000585 (CA-NAP-710/H) within 0.25 mile of the project; Several other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547
S-034210a	Vida Germano	2006	Historical Resources Evaluation Report for the Route 29 Saint Helena Channelization Project in Napa County, California, 04-NAP-29, PM 25.5/28.4 (KP 41.0/45.7), EA 259400	Architectural/ historical, Evaluation, Field study	P-28-000585 (CA-NAP-710/H) within 0.25 mile of the project; Several other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547
S-034210b	Eric Wohlgemuth and Meta Bunse	2007	Archaeological Survey Report for the St. Helena Left-Turn Channelization Project, along State Route 29 near St. Helena, Napa County, California, 04-NAP-29, PM 25.5-28.4 (KP 41.0/45.7), EA 025940	Archaeological, Field study	P-28-000585 (CA-NAP-710/H) within 0.25 mile of the project; Several other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547
S-034210c	Eric Wohlgemuth, Jeffrey Rosenthal, and Meta Bunse	2006	Prehistoric Land Use and Obsidian Production in Upper Napa Valley: Extended Phase I Investigations at CA-NAP-710/H, -711, and -805, and Phase II Investigations at CA-NAP-710/H and -712, along State Route 20 near St. Helena, Napa County, California, 04-NAP-29, PM 25.5-28.4 (KP 41.0/45.7), EA 025940	Archaeological, Architectural/ historical, Excavation	P-28-000585 (CA-NAP-710/H) within 0.25 mile of the project; Several other resources outside of the project vicinity	P-28-000966 (CA-NAP-1113H) P-28-001547
S-043827	Heidi Koenig	2014	Napa River Restoration Rutherford Reaches 5, 6, 7, and 9 Napa County, California Extended Phase I Report	Archaeological, Excavation, Field study	P-28-000828 (CA-NAP-32) within 0.25 mile; One other resource outside of the project vicinity	None
S-043827a	Heidi Koenig	2014	Napa River Restoration Rutherford Reaches 5, 6, 7, and 9 Napa County, California Draft Extended Phase I Work Plan	Archaeological, Management/ planning	P-28-000828 (CA-NAP-32) within 0.25 mile; One other resource outside of the project vicinity	None

TABLE 5.1, con't
STUDIES WITHIN/ADJACENT TO OR WITHIN 0.25 MILE OF THE APE

Report #	Author	Date	Title	Study Type	Comments	Resources In/Adjacent
Within 0.25 mile of APE, con't						
S-043827b	Heidi Koenig	2014	Napa River Restoration Rutherford Reaches 5, 6, 7, and 9 Napa County, California Draft Phase I Cultural Resources Survey Report	Archaeological, Field study	P-28-000828 (CA-NAP-32) within 0.25 mile; One other resource outside of the project vicinity	None
S-043827c	Heidi Koenig	2014	Napa River Restoration Rutherford Reaches 5, 6, 7, and 9 Napa County, California Draft Archaeological Monitoring Results Report	Monitoring	P-28-000828 (CA-NAP-32) within 0.25 mile; One other resource outside of the project vicinity	None
S-051177	CALTRANS	1977	Historic Property Survey Report, State 128 in Napa County, 0.5 Mi. East of Rutherford, Post Miles 5.1/5.55, 04209-410091	Archaeological, Field study, Management/ planning	Negative	None
S-051177a	Thomas F. King	1973	Archaeological Impact Evaluations: Route 25 & 121, Imola Ave.-Suscol Road; Route 128 Napa River & hopper Slough Bridge, Napa County, California (EXCERPT)	Archaeological, Field study	Negative	None
S-051177b	Ronald O. Foote and Russell W. Porter	1975	Office of Historic Preservation Consultation, Heritage Resources, Hopper Slough and Napa River Bridge	OHP Correspondence	Negative	None

TABLE 5.2
RESOURCES WITHIN /ADJACENT TO OR WITHIN 0.25 MILE OF THE APE

Resource	Type	Recorded by	Eligibility NRHP/CRHR	Comment
In/adjacent to APE				
P-28-000136 (CA-NAP-144)	Prehistoric; Site	1951 (D.A. Fredrickson)	Not previously evaluated - does not appear eligible for the NRHP or the CRHR as it lacks integrity and cannot provide any additional important information for prehistory (Criterion d/4)	Adjacent to and partially within Group A
P-28-000470 (CA-NAP-588)	Prehistoric; Site	1981 (K. Flynn)	Not evaluated – outside of project APE	Boundary is approximate; adjacent to north bank of Group A – backhoe testing determined that resource did not extend into APE
P-28-000472 (CA-NAP-590)	Prehistoric; Site	1981 (K. Flynn, T. Marks)	Not previously evaluated - does not appear eligible for the NRHP or the CRHR as it lacks integrity and cannot provide any additional important information for prehistory (Criterion d/4)	Within Group C
P-28-000473 (CA-NAP-591)	Prehistoric; Site	1981 (T. Marks)	Not previously evaluated - does not appear eligible for the NRHP or the CRHR as it lacks integrity and cannot provide any additional important information for prehistory (Criterion d/4)	Within Group C

TABLE 5.2, con't
RESOURCES WITHIN /ADJACENT TO OR WITHIN 0.25 MILE OF THE APE

Resource	Type	Recorded by	Eligibility NRHP/CRHR	Comment
In/adjacent to APE				
P-28-000474 (CA-NAP-592)	Prehistoric; Site	1981 (K. Flynn, T. Marks)	Not previously evaluated - does not appear eligible for the NRHP or the CRHR as it lacks integrity and cannot provide any additional important information for prehistory (Criterion d/4).	Within Group C
P-28-000475 (CA-NAP-593)	Prehistoric; Site	1981 (T. Marks)	Not previously evaluated - does not appear eligible for the NRHP or the CRHR as it lacks integrity and cannot provide any additional important information for prehistory (Criterion d/4)	Within Group C
P-28-000966 (CA-NAP-1113H)	Historic; Building, Structure, Element of district Napa Valley Railroad Line (also referred to as the Napa Valley Wine Train)	1998 (Adam Sriro, Bright Eastman) 1999 (J. Nelson) 2001 (Matt Bischoff) 2006 (Vida Germano, Noah Stewart) 2008 (Vicki Beard) 2009 (Nelson Thompson)	Not eligible (6)	Adjacent to Group C
P-28-001547	Historic; District Napa Valley Railroad District (also referred to as the Napa Valley Wine Train)	2006 (Vida Germano)	Not eligible (6)	Within Group C and adjacent to Group B
Within 0.25 mile of APE				
P-28-000137 (CA-NAP-145)	Prehistoric; Site	1951 (D.A. Fredrickson) 2005 (FWARG)	Not evaluated (7)	Ca. 300 feet south of Group A
P-28-000147 (CA-NAP-155)	Prehistoric; Site	1951 (R.E. Greengo)	Not evaluated	Ca. 1000 feet southwest of Group A
P-28-000285 (CA-NAP-382)	Prehistoric; Site	1976 (Yolande Beard)	Not evaluated	Ca. 525 feet north of Group A
P-28-000469 (CA-NAP-587)	Prehistoric; Site	1981 (Katherine Flynn, Terry Hunt, Margaret Duddy, Steven O'Brien)	Not evaluated	Ca. 1050 feet southwest of Group A
P-28-000471 (CA-NAP-589)	Prehistoric; Site	1981 (K. Flynn, T. Marks)	Not evaluated	Ca. 500 feet northwest of Group C
P-28-000585 (CA-NAP-710/H)	Prehistoric, Historic; Site	1985 (Oman, Schuster, Noble) 2005 (R. Douglass) 2006 (Wohlgemuth)	Not eligible (6Y)	Ca. 600 feet north of Group B and 680 feet north of Group C
P-28-000828 (CA-NAP-32)	Prehistoric; Site Kolb Site	1947 (R.F. Heizer, L.L. Rainier, A. Miller) 1960 (Stoll) 1972 (Yolande Beard) 1976 (Yolande Beard) 1979 (K. Flynn, M. Duddy) 2014 (Heidi Koenig)	Not evaluated	Ca. 650 feet southwest of Group A
P-28-000999	Historic; Building Howard K. and Joan George Farm House	1999 (Dennis Harris)	May become eligible with restoration (4S7)	Ca. 250 feet south of Group B

P-28-000136 / CA-NAP-144

Site was recorded by Fredrickson in July 1951 and relocated in 1960 (Stoll 1960b). The site's location as mapped by the CHRIS/NWIC is adjacent to or just within the APE on the south side of Bale Slough [see Fig. 3]. In 1981, the location was described as on the 200-foot contour, on a natural levee on [the] west bank of the slough (see Flynn 1981a). The BASIN 2020 surface inventory did not observe any cultural materials at the CHRIS/NWIC location but did note a low density lithic scatter to the immediate north within the APE (see Comments below).

The site description in 1951 noted the presence of "Obsidian chips and small amt. of broken rocks. Located on natural levee on west bank of slough" including "point and blade frags. Poss. pestle frag." The alluvium [soil] was slightly darker than the surrounding soil. At the time, the site appeared to extend "100 yds. NS/35 yds EW" with a depth of "probably 1'" [foot] and height of "Ca. 2'" [2 feet] and "Most concentrated along the slough bank." Impacts consisted of vineyards and "Pumps on west side of site." By 1960 the site was "No longer visible due to cultivation in area" – "Grapevines" distinguished by "Dark Brown" soil that was similar to the surrounding soil type, lacking surface artifacts and any evidence of house pits. The site had been "Destroyed", a characterization underscored by the remark "Site no longer exists due to cultivation. Excavation of the site was not recommended (Stoll 1960a).

Comment – the site was relocated during BASIN's field inventory based on a surface inspection. The resource appears to be adjacent to but north of the CHRIS/NWIC mapped location. A low density obsidian scatter with flakes ranging from 1-2 mm to 40+ mm was present along the access road and within a portion of the adjacent vineyard outside of the APE. Observed prehistoric cultural material consisted of a number of obsidian flakes (various reduction stages), several biface fragments including a possible projectile point fragment, groundstone fragments, a pestle fragment, and very small quantities of fire affected rock. The sediment was a grayish brown (10YR 5/2) loam. Site density ranged from an average of 15 flakes per square meter to 3 flakes per square meter. Trowel excavation noted lithic material 6-inches below the surface. The observations are similar to the initial description in 1951.

> Obsidian projectile point (incomplete, Stage 4/5) 40 mm long x 20 mm wide x 4 mm thick
>
> Obsidian biface (incomplete, Stage 3) 50 mm long x 16 mm wide x 5 mm thick
>
> Obsidian medial biface (incomplete, Stage 3) 20 mm long x 17 mm wide x 2 mm thick
>
> Granite pestle (incomplete) 5 cm long x 5 1/2 cm wide x 5 cm thick, smooth and polished along the shaft, with breaks at both ends
>
> Fine grained volcanic rock (basalt ?), formed flake tool, domed scraper

Inspection of the location of the few artifact finds in relation to the vineyard rows suggested that soil displacement and dispersal during plowing (or ripping) has impacted the resource. The lithics appeared to be concentrated at plow or equipment turn points with further dispersal probably occurring during travel along the vineyard rows and unimproved access road. Overbank flooding of Bale Slough during episodic flooding may have also contributed to dispersal.

Presence/Absence Testing – backhoe testing by BASIN in December 2020 exposed no cultural materials to the immediate northeast (BTU 7) and east (BTU 6) suggesting a limited surface extent for the resource [Figs. 4A-B]. The site, as interpreted by BASIN, suggests a small, very low density and shallow lithic scatter dispersed by both natural and agricultural impacts with surface visibility dependent on exposure during agricultural activities. The resource has been severely impacted both horizontally and vertically by agricultural plowing and use for at least 70 years. The site was probably a small temporary campsite or use area – typical of occupation along water courses in the Napa Valley.

Evaluation – CA-NAP-144 does not appear eligible for the NRHP or the CRHR as it does not satisfy criterion (d)/(4) ". . . have yielded, or may be likely to yield, information important in prehistory or history" and the resource does not meet the overall requirements of integrity of location, materials, design and association. *Integrity* is the ability of the archaeological property to convey significance through physical features and context.[4]

> The resource does have integrity of *location* as the site was able to be relocated although not within its original mapped location. The probable intermittent and seasonal use of the site for an unknown length of time did not result in the formation of any discernible cultural deposits that appear to have survived the impacts from vineyard levelling and cultivation.
>
> The site has minimal cultural *materials* present that have been impacted by soil displacement and dispersal during plowing (or ripping) No culturally affected sediment is present. The paucity of cultural materials and their dispersion over the site provides no or very limited data sets to answer potential research questions on site chronology and possible use.
>
> The development and interpretation of relationships and/or patterning is not possible due to the dispersion of the minimal artifacts by previous and ongoing agricultural operations and the existing access road. No identifiable cultural features are present (*design*).
>
> The site lacks *association*. The available information provides no or very minimal data sets to answer research questions on site chronology, location and possible use.

P-28-000470 / CA-NAP-588

The Waste Water Pond Site, is adjacent to the APE on the north bank of Bale Slough. It was recorded in 1981 by Flynn (1981b) during an inventory of the Beaulieu Vineyards located approximately 0.5 mile east of Highway 29 / Highway 128 confluence of Bale and Hopper sloughs (see Flynn 1981a) [see Fig. 3].

The resource was initially described as "a campsite situated atop a low knoll which was later leveled and excavated during either rechannelization of Hopper Slough or the construction of the [two northern] disposal ponds." The later description identified the resource as a village location (mound) with a midden deposit and extensive deposit of cultural materials. The "high density of

4. Alternatively, the integrity of an archaeological site is considered sufficient if the quality of information contained within it can answer important research questions developed for the property.

flakes and tools" included obsidian, chert, basalt and quartzite. Whole and fragmentary bifaces (projectile points and spear points) as well as features with ". . . concentrations of red, baked earth, fire-cracked rock, ash deposits (indicative of hearths or possibly cremation burials), and a well-developed midden soil deposit concentrated near the northeastern-most pond margin at the bend in Hopper Slough." Ground stone tools were also present.

The site and another prehistoric resource (P-28-000285 / CA-NAP-382) to the immediate northeast on Hopper Slough may have been part of the same site. Levelling and excavation of this site during either the rechannelization of Hopper Slough or the construction of the Beaulieu Vineyards waste water disposal ponds may have resulted in the physical separation of the two resources (Flynn 1981a-b, 1982).

Comment – no indications of the site were noted on the surface of the south bank of Bale Slough or within the channel during the BASIN field inventory. The north bank was inaccessible and the area has been severely impacted by construction of the waste water disposal ponds and their subsequent expansion and ongoing maintenance. A review of an archaeological monitoring letter (Flynn 1982) indicates that over excavation at the location of the existing ponds during construction exposed quantifies of prehistoric cultural material with the northernmost area identified as especially sensitive. It appears that the resource was badly impacted and possibly destroyed during construction in 1982. No further information is available. The resource is outside of the project APE.

Presence/Absence Testing – backhoe testing by BASIN in December 2020 on the south top of bank opposite the site location on the north bank exposed no cultural materials (BTU 9-10) [Figs. 4B-C]. The resource appears limited to the north bank and is outside of the project APE.

Evaluation – Not evaluated. CA-NAP-588 is not present in the project APE. However, the site appears to be have been destroyed during construction in 1982 and consequently does not appear eligible for the NRHP or the CRHR as it lacks integrity and cannot provide important information for prehistory (Criterion d/4).

5.1B Group B

No recorded resources are present within the Group B APE. The west end of the APE terminates at the boundary for the linear Napa Valley Railroad District (P-28-001547, Germano 2006) which has been determined not eligible for the NRHP (see Section 5.1C for a site summary) [see Fig. 3].

5.1C Group C

Four recorded prehistoric resources are present within the Group C APE. The sites were interpreted as possibly representing long-term, temporary camping activity and not "a large scale village location" (Flynn 1981a; Flynn and Marks 1981b/form). Their location within a former marshy area on slightly elevated ground suggests a deliberate choice for use.

In addition, the Napa Valley Railroad District (P-28-001547) is within the APE while P-28-000966 (CA-NAP-1113H), an element of the Napa Valley Railroad Line, is adjacent (see Table 5.2). Both historic resources are not eligible for the NRHP (see Table 5.2).

P-28-000472 / CA-NAP-590

P-28-000472 / CA-NAP 590, the Vineyard Mound Site, covered a 75+ meter diameter/oval area which was 1.5 meters (60 inches) higher in elevation than a surrounding vineyard. It had a "slightly midden-like soil" with a depth of 15+ cm (6 inches) (see Flynn 1981c). Vineyard cultivation to a depth of 105 cm, (42 inches) precluded the accurate determination of the surface area due to extensive agricultural disturbance. The site was characterized as a moderately dense scatter (Flynn and Marks 1981 characterize the deposits as a "light scatter") of obsidian, chert, and basalt waste flakes (and quartzite) and tools [bifacial/unifacial], and fire-cracked rock in a slightly stained soil matrix." Basalt groundstone and hammers, "obsidian bifaces ('arrowheads')" were also reported while the presence of several patinated flakes suggested the existence of older "buried deposits."

Comment – no indications of the site were noted on the surface during the BASIN field inventory in 2021. The site location is currently overgrown with seasonal vegetation but appears to have been within an active vineyard since 2002 (and probably earlier) to 2015/2016 when the vines were removed. An area of hard compact dark grayish brown clayey soil was present within the recorded site location which differs slightly in color from the surrounding grayish-brown soil. However, the elevated 1.5 meter "mound" noted in 1981 is no longer present due to agricultural leveling. No surface evidence of any of the cultural material types noted in 1981 are present either within or adjacent to the recorded site location. It appears that the resource has been removed or dispersed by vineyard cultivation over the past 35 years (see Attachments for update).

Evaluation - CA-NAP-590 does not appear eligible for the NRHP or the CRHR as it does not satisfy criterion (d)/(4) ". . . have yielded, or may be likely to yield, information important in prehistory or history" and the resource does not meet the overall requirements of integrity of location, materials, design and association. *Integrity* is the ability of the archaeological property to convey significance through physical features and context.

> The resource does not have integrity of *location* as the site was not able to be relocated. The probable intermittent and seasonal use of the site for an unknown length of time did not result in the formation of any discernible cultural deposits that appear to have survived the impacts from vineyard levelling and cultivation.
>
> The site has no cultural *materials* present including any culturally affected sediment. The paucity of cultural materials and their dispersion over the site provides no or very limited data sets to answer potential research questions on site chronology and possible use.
>
> The development and interpretation of relationships and/or patterning is not possible due to the lack of cultural materials (*design*).
>
> The site lacks *association*. The available information provides no or very minimal data sets to answer research questions on site chronology, location and possible use.

P-28-000473 / CA- NAP 591

P-28-000473 / CA- NAP 591, **t**he Trench Site, is a light, diffuse scatter of obsidian lithics, some very patinated and "reused," as well as a quartzite cobble hammerstone and possible basalt pestle fragment (Flynn 1981a; Marks 1981a/form). The site measured 10-15 meters (33-50 feet) in diameter with an undetermined depth and no perceived elevational difference with the surrounding terrain. The presence of "quite patinated" flakes and a "core" suggested the existence of older "buried deposits" (see Flynn 1981a). The site may possibly represent a long-term, temporary camp.

Comment – no indications of the site were noted on the surface during the BASIN field inventory in 2021. The site location is currently overgrown with seasonal vegetation but appears to have been an active vineyard since 2002 (and probably earlier) to 2015/2016 when the vines were removed. No surface evidence of any of the cultural material types noted in 1981 are present either within or adjacent to the recorded site location. It appears that the resource has been removed by vineyard cultivation over the past 35 years (see Attachments for update).

Evaluation - CA-NAP-591 does not appear eligible for the NRHP or the CRHR as it does not satisfy criterion (d)/(4) ". . . have yielded, or may be likely to yield, information important in prehistory or history" and the resource does not meet the overall requirements of integrity of location, materials, design and association. *Integrity* is the ability of the archaeological property to convey significance through physical features and context.

> The resource does not have integrity of *location* as the site was not able to be relocated. The probable intermittent and seasonal use of the site for an unknown length of time did not result in the formation of any discernible cultural deposits that appear to have survived the impacts from vineyard levelling and cultivation.
>
> The site has no cultural *materials* present including any culturally affected sediment. The paucity of cultural materials and their dispersion over the site provides no or very limited data sets to answer potential research questions on site chronology and possible use.
>
> The development and interpretation of relationships and/or patterning is not possible due to the lack of cultural materials (*design*).
>
> The site lacks *association*. The available information provides no or very minimal data sets to answer research questions on site chronology, location and possible use.

P-28-000474 / CA-NAP-592

P-28-000474 / CA-NAP-592, the Trestle Site, recorded in 1981 (Flynn and Marks 1981b) is located at the confluence of Bale Slough, an unnamed drainage and Bear Creek on the west side of State Highway 29. The resource is at an elevation of 160 feet and is within an area identified as former marshland.

The resource is as a low density surface scatter of patinated obsidian waste flakes and fire-cracked rock fragments exposed within a 5 meter (16 feet) diameter area within vineyard rows and an access road paralleling the slough. The exact boundary could not be determined due to extensive agricultural disturbance including plow drag, ditch excavation and maintenance and/or

construction impact from the adjacent railroad trestle. The patinated obsidian flakes may be due to natural factors rather than as the result of cultural activity. Flynn (1981a) suggested that they may have been introduced in fill soils or as road gravel. No culturally affected sediment was noted.

Comment – no indications of the site were noted on the surface during the BASIN field inventory in 2021. The site location is currently overgrown with seasonal vegetation but appears to have been within an active vineyard since 2002 (and probably earlier) to 2006 when the vines were removed. No surface evidence of any of the cultural material types noted in 1981 are present either within or adjacent to the recorded site location. It appears that the resource has been removed by vineyard cultivation over the past 35 years (see Attachments for update).

Evaluation - CA-NAP-592 does not appear eligible for the NRHP or the CRHR as it does not satisfy criterion (d)/(4) ". . . have yielded, or may be likely to yield, information important in prehistory or history" and the resource does not meet the overall requirements of integrity of location, materials, design and association. *Integrity* is the ability of the archaeological property to convey significance through physical features and context.

> The resource does not have integrity of *location* as the site was not able to be relocated. The probable intermittent and seasonal use of the site for an unknown length of time did not result in the formation of any discernible cultural deposits that appear to have survived the impacts from vineyard levelling and cultivation.
>
> The site has no cultural *materials* present including any culturally affected sediment. The paucity of cultural materials and their dispersion over the site provides no or very limited data sets to answer potential research questions on site chronology and possible use.
>
> The development and interpretation of relationships and/or patterning is not possible due to the lack of cultural materials (*design*).
>
> The site lacks *association*. The available information provides no or very minimal data sets to answer research questions on site chronology, location and possible use.

P-28-000475 / CA-NAP-593/H

P-28-000475 / CA-NAP-593/H, the High Spot Site, was recorded in 1981 by Marks at the south bend of Bale Slough on a high point along the north bank approximately 300 meters (1000 feet) north of the northern boundary of Section 17 at 160-foot elevation. The site is a sparse surface scatter of obsidian flakes, including at least one patinated obsidian core and angular quartz chunk within a probable 10 x 20 meter (32 x 65 feet) area. The resource may be associated with P-28-000473 (CA-NAP-591) to the northeast and P-28-000474 (CA-NAP-592) to the east. Historic glass and ceramic fragments were also present suggesting previous historic disturbance.

Comment – BASIN's field review in 2020 did not relocate the site which is within and adjacent to the project APE and immediately adjacent to an excavated drainage basin. It is possible that site is cultural material from agricultural ditch excavation/maintenance, vineyard cultivation, or a very light density surface scatter. Possible midden development was noted apparently based on a "grey" soil color. However, it is probable that this could represent an organic water-affected

sediment excavated from a ditch as the general area was noted as disturbed by ditch construction and channelization and vineyard cultivation (see Attachments for update).

Evaluation – CA-NAP-593 does not appear eligible for the NRHP or the CRHR as it does not satisfy criterion (d)/(4) ". . . have yielded, or may be likely to yield, information important in prehistory or history" and the resource does not meet the overall requirements of integrity of location, materials, design and association. *Integrity* is the ability of the archaeological property to convey significance through physical features and context.

> The resource does not have integrity of *location* as the site was not able to be relocated. The probable intermittent and seasonal use of the site for an unknown length of time did not result in the formation of any discernible cultural deposits that appear to have survived the impacts from vineyard levelling and cultivation.
>
> The site has no cultural *materials* present including any culturally affected sediment. The paucity of cultural materials and their dispersion over the site provides no or very limited data sets to answer potential research questions on site chronology and possible use.
>
> The development and interpretation of relationships and/or patterning is not possible due to the lack of cultural materials (*design*).
>
> The site lacks *association*. The available information provides no or very minimal data sets to answer research questions on site chronology, location and possible use.

P-28-001547

P-28-001547, the Napa Valley Railroad [District] (NVRR), also known as the Napa Valley Wine Train [District], was documented and evaluated by Germano (2006) as part of P-28-000966 / CA-NAP-1113H, the NVRR by Germano and Stewart (2006a-b). The linear NVRR District is limited to approximately 21-mile segment of the original 35-mile NVRR alignment. The District consists of a main line track, spur lines, trestles, depots, rural stations, loading platforms, covered stops, culverts, water tanks, etc. parallel to State Highway 29 from the Imola siding in the City of Napa north to the Krug warehouse located just north of St. Helena.

The NVRR was incorporated March 2, 1864. Construction from Suscol north began November 21, 1864 with grading complete to Napa City by January 1865. The second phase of construction began in March 1867 and reached Oakville by September, St. Helena in February 1868, and Calistoga in August 1868. The final segment from Suscol south to Adelante/Napa Junction opened in January 1869. The 34.4 mile long NVRR was purchased in May 1869 by the California Pacific Extension Company, consolidated with the California Pacific Railroad Company (established 1865) and came under the control of the Central Pacific on August 1, 1871. It was leased to the Southern Pacific Company in 1885, later controlled by the Central Pacific Railroad, and became part of the Southern Pacific Company in 1898. Passenger service was discontinued in July 1929. The Southern Pacific Transportation Company attempted to abandon the freight line in the mid-1980s. The Napa Valley Wine Train, Inc., organized in December 1984, purchased part of the route between Napa and St. Helena and began operation September 1989. The NVRR was realigned between Napa and Napa Junction and removed between St. Helena and Calistoga. As a result, the linear district boundary is limited to the

alignment between the City of Napa and St. Helena, approximately 21 miles which parallel State Highway 29.

Evaluation - the district has been evaluated not eligible for inclusion on the NRHP at the local level due to a lack of integrity to convey its significance. It is not a historical resource for the purpose of the California Environmental Quality Act (CEQA). Two applicable NRHP criteria for the district were considered and rejected due to a loss of integrity. Criterion a for its association with the development of transportation, agricultural commerce and settlement throughout the Napa Valley from the 1864 construction of the NVRR line to 1930, the year passenger service was discontinued [period of significance] and criterion b for its association with pioneer and real estate promoter Samuel Brannan, who funded construction of NVRR to foster patronage of his Calistoga Hot Springs resort which opened October 1868. (Hart 1987:78; Kyle 2002:249; Germano and Stewart 2006a/form; N. King 1967; G. King 1986).

P-28-000966 / CA-NAP-1113H

The Southern Pacific Railroad has been recorded in seven counties by six different individuals/entities between 1998 and 2009 (see Table 5.2). The alignment within and adjacent to the APE is known as the Napa Valley Railroad (NVRR) as well as the Napa Valley Wine Train and is a component of P-28-001547, the Napa Valley Railroad District (NVRR). The standard-gauge NVRR railroad originally extended from Suscol north to Calistoga, a distance of approximately 35 miles.

The approximately 4.2 mile segment of railroad track between the depots at Rutherford north to St. Helena is within and adjacent to the APE. The alignment parallels the east side of State Highway 29 and is offset approximately 30 feet from the edge of the pavement. The resource is described as "one track, two spur lines, modern ballast, various aged railroad ties, tracks, and other metal hardware" as well as five culverts (three concrete and two corrugated metal) and a wood trestle over Bale Slough north of Rutherford and over Sulphur Creek (St. Helena). The Bale Slough Trestle appears to be modern construction, rebuilt in the last 20 years, possibly circa 1995 when the highway bridge over Bale Slough was replaced (Germano and Stewart 2006a-b/form).

The NVRR was determined eligible in 2002 for inclusion on the NRHP under criterion a for its association with the development of agriculture in the Napa Valley and criterion b for the association with Samuel Brannan, a real estate promoter and one of the first individuals to cultivate wine grapes in the valley. However, the NVRR was subsequently re-evaluated as not eligible for the NRHP and determined not to be a historical resource under CEQA (Hart 1987:78; Kyle 2002:249; Germano and Stewart 2006a/form; N. King 1967; G. King 1986; Anonymous/Author not stated 2020). The *Built Environment Resources Directory* (BERD) lists the Napa Valley Wine Train, Railroad as code 6Y (determined ineligible for NR by consensus through Section 106 process) (CAL/OHP 2019).

5.2 FIELD INVENTORY (see also Section 5.1 for site information)

Two field inventories were completed of the APE by Christopher Canzonieri (MA, RPA) on July 22-23, 2020 with a supplementary review of Group C on June 15, 2021 due to an expansion of

the APE. Dr. Jelmer Erkins, Department of Anthropology, University of California, Davis assisted with the review and documentation of CA-NAP-144 within Group A on July 23, 2020. Mr. Canzonieri completed a supplemental field inventory June 15, 2021 of the expanded APE in Group C.

5.2A Field Inventory (July 22-23, 2020)

The June 22-23 field inventory extended from the Highway 128/ Rutherford Road west to the project terminus west of State Highway 29. Field transects were spaced approximately 3-5 meters apart and generally paralleled Bale Slough and Bear Creek on the south bank (Group A) and included both banks in Group B [see Fig. 3]. Group C included a small area adjacent to Bear Creek where it met Bale Slough.

Survey areas within vineyard rows followed the row direction; open fields were surveyed either north to south or east to west. Visibility within the project varied from 0% to 100%. Vegetation included vineyards, grassy fields and the riparian corridor associated with Bale Slough and Bear Creek. The riparian corridor included blackberry brambles, tules, oak trees, rose bushes, Eucalyptus trees, and seasonal grasses. The slough and creek channels were accessed where possible.

Various modern irrigation water delivery equipment and piping (e.g., electric pumps, piping, valve controls, etc.) were present at several locations within the APE. All of the equipment was recent or less than 25 years in age and/or had been subject to repair obscuring or modifying any older equipment. Two former railroad freight car or flatcar beds or decks without any other accessories have been installed across Bale Slough in Group A and Group B. The decks appear to have been inset within each bank edge at top of slope and dropped into place with no visible abutments installed. No dates of manufacture or other identifiers were observed either on the decks or sides. The bridges were not recorded or evaluated due to their apparent less than 45 years in age.

The July, 2020 inventory also included an inspection of a small portion of Group C along Bear Creek near its confluence with Bale Slough west of State Highway 29.

5.2B Field Inventory (June 15, 2021)

The June 21, 2021 field inventory focused on Group C west of State Highway 29 which had been expanded. The area previously inventoried in Group C was re-inventoried at part of the field survey. Field transects were oriented east to west and spaced approximately 10 meters apart except within the mapped and adjacent locations for the four previously recorded prehistoric sites. In these areas, field transects were spaced approximately one meter apart. Field visibility was generally poor, with 0-5% of the surface observable. The parcel is overgrown in dense seasonal grasses, wheat, morning glory, nettles, and various other plants. No visible indications of the former vineyard are present. The entire property is bordered by earth drainages that connect to Bale Slough at State Highway 29. Vegetation at and within the drainages was densely overgrown with blackberry brambles.

5.3 FIELD INVENTORY RESULTS BY GROUP

The field inventory results are reported by group. One prehistoric site was relocated in Group A and none of the prehistoric sites recorded within Group C were relocated. The two historic resources in or adjacent to Group C were relocated [see Fig. 3]. No additional resources were observed.

5.3A Group A [July 2020, Figs. 5-12]

Group A. covering approximately 5.8 acres, is located just west of Highway 128 and the Napa River along Bale Slough. The APE is restricted to the south bank and channel. The north bank is not included within the APE in Group A. The south bank includes an unimproved access road parallel to the slough and offset from it by 10-35 feet; vineyards; and, an open area at the southern end due to a large meander which formerly contained a vineyard that has been removed (est. 1,8 acres) Field transects in Group A were spaced approximately three meters apart. Visibility was poor with approximately 5% of the surface observable at the southern end (former vineyard). Visibility along the access road and vineyard was excellent with approximately 50-100% of the surface observable. The riparian corridor was densely overgrown; areas of exposed and eroded channel banks were present throughout. The slough channel was surveyed at accessible locations.

CA-NAP-144, adjacent to the APE at the southern end, was relocated during the field inventory. However, it was adjacent to and just north of the northern boundary of the site as mapped by CHRIS/NWIC. A low density obsidian scatter with flakes ranging from 1-2 mm to 40+ mm was present along the access road and within a portion of the adjacent vineyard outside of the APE. Observed prehistoric cultural material consisted of a number of obsidian flakes (various reduction stages), several biface fragments including a possible projectile point fragment, groundstone fragments, a pestle fragment, and very small quantities of fire affected rock. Site density ranged from an average of 15 flakes per square meter to 3 flakes per square meter. Trowel excavation noted lithic material 6-inches below the surface. The observations are similar to the initial description in 1951 (see Section 5.1 – Group A for further information).

A background scatter of a few isolated obsidian flakes and chunks was noted within the access road at scattered locations. No cultural materials were noted in association and it is probable that they represent natural obsidian broken and dispersed by use of the access road and agricultural plowing. This scenario is typical of the Napa Valley due to the presence of local obsidian deposits throughout the valley.

5.3B Group B [July 2020, Figs. 5, 13-18]

Group B, covering roughly 5.5 acres, is located west of the access road at the west end of the Rutherford House (1074 Highway 128/Rutherford Road) property and continues west to Highway 29. All field transects were placed parallel to the slough and access road. Visibility was excellent with approximately 75-100% of the surface observable along the access roads and a small open field. Visibility within the slough was limited to the channel base and openings along the slough banks. This segment includes a railroad freight or flatcar bridge connecting

both sides of the slough. The majority of the slough has been previously realigned. No prehistoric or historic cultural material was observed.

5.3C Group C [July 2020 / June 2021, Figs. 5, 19-29]

Group C, west of State Highway 29 and the Napa Wine Train tracks, and covering approximately 44 acres, consists of two areas. Area 1, the larger of the two areas, is on the north side of Bale Slough and consists of fallow agricultural land that was formerly used as a vineyard. The entire property is bordered by earth drainage ditches that connect to Bale Slough at State Highway 29. Area 2, a small triangular area with dense vegetation (e.g., blackberry brambles) is bounded by Bear Creek on the west, Bale Slough on the north and State Highway 29 on the east. The field inventory in June 2021 re-inventoried the areas covered in July 2020.

Field transects were spaced approximately 3-5 meters apart and oriented northeast to southwest for Area 1. Special attention was focused on the locations of the four previously recorded prehistoric sites within this area with transects reduced to one meter spacing. Visibility was poor with less than 5% observable due to invasive ground cover (e.g., seasonal grasses, wheat, morning glory, nettles) that occurred after the removal of the former vineyard. A modern water pump station is near the eastern corner of the property adjacent to State Highway 29.

Area 2 was extremely difficult to access due to the presence of dense vegetation associated with a seasonal wetland. Transects were randomly placed and spaced between 3-5 meters apart where possible. Visibility was extremely poor with almost none of the surface visible. Because of the poor visibility a review of the access road and vineyard to the south of Bear Creek was undertaken.

No prehistoric or historic cultural material was observed within the two areas comprising Group C. None of the previously recorded resources could be relocated within the group.

5.4 BACKHOE PRESENCE/ABSENCE TESTING PROGRAM

BASIN completed a backhoe presence/absence testing program within the Group A APE on December 8-9, 2020 to determine if significant subsurface archaeological materials associated with CA-NAP-144 were present within the APE and the Area of Direct Impact (ADI) to guide the development of the future grading program for the restoration project [Figs. 4A-C]. The secondary focus was to determine if significant cultural deposits associated with CA-NAP-588 located on the north bank of the slough were present within the south bank APE and their extent. In addition, selected test units were excavated at field selected locations to determine if as yet unknown archaeological materials could be present at areas proposed for grading.

It was the intent of the P/A testing program to not engage in any data recovery but rather determine what cultural materials might be present to assist with developing future design options and a potential future data recovery program.

The program excavated 11 backhoe test trenches (BTUs) at intuitively selected locations within the south bank [see Fig 4]. Four BTUs (1-4) were completed within a meander at the south end of the APE between the Vineyard Road leading to 990 Rutherford Road and the intersection of

Rutherford Road and Bale Slough [see Fig. Fig 4A]. Seven other BTUs (5-11) were intuitively placed within the Group A APE starting at STA 8+50 to ca. STA 25+25. Each BTU was 18-24 inches wide, 5-6+ feet deep and ranged from 4-10 feet long depending on field circumstances and to minimize damage to the creek channel bank(s). Observations from each trench were recorded and selected trench sidewalls inspected and photographed [Figs. 30-51]. Three to five intuitively selected buckets of sediment from each trench were hand inspected and/or screened through ¼" mesh to check for cultural materials.

Sediments were generally clay loams to silty clay loams depending on stratum. Sediment colors included dark yellowish brown, very dark brown, dark brown, very dark grayish brown, very dark gray and brown. Boundaries were usually diffuse or gradual. Few pebbles were present in the sediment . Modern cultural materials were exposed in BTUs, 2, 6 and 9 indicative of agricultural disturbance (see Table 5.3).

Three BTUs (5-7) had very small quantities of possible prehistoric cultural materials present.

> BTU 5 - small piece of charcoal and two possible surface obsidian flakes. It is probable that charcoal is modern and the lithics represent background scatter. No other cultural materials present.
>
> BTU 6 – two obsidian lithics no other cultural materials present except for a broken geotechnical auger tip and a vineyard "end post" base noted at 36+ inches below the surface indicating previous agricultural disturbance. Obsidian probably represent background scatter and/or disturbance, transport from other areas.
>
> BTU 7 – obsidian flakes present due to shatter of a large piece of Ossian that had been crushed by heavy equipment. Natural cobble concentration noted at 27 inches. All finds determined to be non-cultural.

TABLE 5.3
Bale Slough Group A - Presence/Absence Test Unit Sediment Review

Stratum	Depth (inches)	Descriptions/Observations	General Comments
BTU 1 – Length 8 feet		Width 2 feet GPS: 10S 551115 mE 4257520 mN WGS 84	
1	0-63	Dark yellowish brown (10YR 3/4) clay loam; compact and hard; very few pebbles; very diffuse boundary	No cultural materials
2	63-72+	Very dark brown (10YR 2/2) silty clay loam; slightly mottled yellowish brown (10YR 5/6); a few small rootlets	Possible single charcoal fragment – may or may not be cultural; one small area of faunal fragments, possibly in burrow; no cultural materials
BTU 2 – Length 8 feet		Width 2 feet GPS: 10S 551093 mE 4257483 mN WGS 84	
1	0-36	Dark brown (10YR 3/3) clay loam; compacted and hard; very few roots; very diffuse boundary	Unit moved ca. 3 feet north – due to exposure of lava rock associated with former irrigation pipe; no cultural materials

TABLE 5.3, con't
Bale Slough Group A - Presence/Absence Test Unit Sediment Review

Stratum	Depth (inches)	Descriptions/Observations	General Comments
BTU 2 – Length 8 feet		Width 2 feet GPS: 10S 551093 mE 4257483 mN WGS 84	
2	36-67+	Very dark brown (10YR 2/2) silty clay loam	One glass fragment and a 1972 penny recovered; no other cultural materials
BTU 3 – Length 8 feet		Width 2 feet GPS: 10S 551089 mE 4257504 mN WGS 84	
1	0-43	Dark yellowish brown (10YR 3/4) clay loam; no gravel; a few roots; very diffuse boundary	No cultural materials
2	43-63+	Very dark grayish brown (10YR 3/2) silty clay loam	No cultural materials
BTU 4 – Length 10 feet		Width 2 feet GPS: 10S 551078 mE 4257511 mN WGS 84	
1	0-32	Brown (10YR 4/3) clay loam; a few rounded pebbles; clear to diffuse boundary	No cultural materials
2	32-66	Very dark brown (10YR 2/2) silty clay loam; slightly mottled; a few roots and rootlets; diffuse boundary	Possible charcoal fragment – may or may not be cultural; No cultural materials
3	66-68+	Dark brown (10YR 3/3) clay loam; just visible at base of unit	No cultural materials
BTU 5 – Length 8 feet		Width 2 feet GPS: 10S 551007 mE 4257525 mN WGS 84	
1	0-39	Dark yellowish brown (10YR 4/4) clay loam; slightly mottled (brown 7.5YR 5/3); a few roots; very diffuse boundary	One small piece of charcoal; two obsidian lithics – surface ??; no other cultural materials
2	39-75+	Very dark grayish brown (10YR 3/2) clay loam; dry, compacted; a few roots	No cultural materials
BTU 6 – Length 8 feet		Width 2 feet GPS: 10S 550947 mE 4257589 mN WGS 84	
1	0-36	Dark grayish brown (10YR 4/2) clay loam; very hard, dry sediment; very diffuse boundary	Two obsidian lithics, possible surface – no other "cultural" finds
2	36-60+	Very dark gray (10YR 3/1) clay loam; mottled (dark grayish brown 10YR 4/2); very hard and dry; a few pebbles	Geotechnical auger tip and wooden vineyard end post fragment; no other cultural materials
BTU 7 – Length 8 feet		Width 4 feet GPS: 10S 550899 mE 4257641 mN WGS 84	
1	0-8	Dark grayish brown (10YR 4/2) clay loam; loose surface sediments over very dry, hard, blocky sediments; a few small roots; clear straight boundary	Within area noted as lithic scatter during field survey (7/2020) [see Fig. 4B]; No cultural materials
2	8-36	Dark grayish brown (10YR 4/2) silty clay loam; very dry and compacted; a few small roots; gradual straight boundary	Obsidian flakes, ca. 20 (many from "shatter" of a large piece of obsidian that had been crushed; Cobble concentration at 27 inches; charcoal, 1 small lump. Inspection strongly indicated that the finds were non-cultural
3	36-54+	Brown (10YR 4/3) silty clay loam; patchy mottles (very dark grayish brown 10YR 3/2)	No cultural materials

TABLE 5.3, con't
Bale Slough Group A - Presence/Absence Test Unit Sediment Review

Stratum	Depth (inches)	Descriptions/Observations	General Comments
BTU 8 – Length 8 feet		Width 2 feet GPS: 10S 550795 mE 4257678 mN WGS 84	
1	0-39	Dark grayish brown (10YR 4/2) clay loam; dry, compacted sediments; 2 large rocks, oxidizing sandstone (30-40 cm) noted in backdirt; a few small roots; very diffuse boundary	Fragmentary irrigation pipe at 12 inches; No cultural materials
BTU 8 – Length 8 feet		Width 2 feet GPS: 10S 550795 mE 4257678 mN WGS 84	
2	39-60+	Very dark grayish brown (10YR 3/2) clay loam with mottles (very dark reddish brown 10R 3/2) oxidized sandstone stains; dry and compacted; a few cobbles and small roots	No cultural materials
BTU 9 – Length 9 feet		Width 2 feet GPS: 10S 550763 mE 4257706 mN WGS 84	
1	0-12	Dark grayish brown (10YR 4/2) clay loam; dry, compacted sediments; a few pebbles; gradual boundary	One fragment of ceramic drain pipe near surface; no other cultural materials
2	12-52+	Very dark grayish brown (10YR 3/2) clay loam; dry and compacted; small roots and rootlets	No cultural materials
BTU 10 – Length 8 feet		Width 2 feet GPS: 10S 550720 mE 4257740 mN WGS 84	
1	0-12	Very dark grayish brown (10YR 3/2) clay loam; very dry and compacted; a few small roots and rootlets; gradual boundary	No cultural materials
2	12-56+	Very dark brown (10YR 2/2) clay loam; very dry and compacted; no roots	No cultural materials
BTU 11 – Length 8 feet		Width 2 feet GPS: 10S 550595 mE 4257767 mN WGS 84	
1	0-24	Very dark grayish brown (10YR 3/2) clay loam; dry and compacted; rare roots and pebbles; gradual boundary	No cultural materials
2	24-32	Dark grayish brown (10YR 4/2) clay loam; dry and compacted; no roots or rootlets; gradual boundary	No cultural materials
3	32-52+	Brown (10YR 4/3) silty clay loam; less dry and compacted than upper layers	No cultural materials

5.5 SUMMARY

The identification and evaluation effort including archival research, two field inventories and a presence/absence backhoe testing program restricted to Group A did not find any historic properties individually eligible for the NRHP or the CRHR under any of the criteria within the Bale Slough APE.

Group A - CA-NAP-144, the only recorded resource in the APE, was relocated near its mapped location. It does not appear eligible for the NRHP or the CRHR as it does not satisfy criterion (d)/(4) and lacks integrity. No other resources were located in Group A either during the field inventory or during the backhoe testing program.

Group B – no recorded resources and no cultural materials were located during the field inventory.

Group C – four prehistoric resources and one historic linear feature have been recorded within the APE. Another historic resource is adjacent. The four previously recorded prehistoric sites, CA-NAP-590, NAP-591, NAP-592 and NAP-593, were not relocated in their mapped locations. This may be due to impacts from past agricultural operations including land levelling for vineyard development that occurred after their recordation. Site use at the time of recordation was inferred as temporary camping activity. P-28-001547, the Napa Valley Railroad District, is within the APE while P-28-00966, an element of the Napa Valley Railroad Line, is adjacent.

The four prehistoric resources do not appear eligible for the NRHP or the CRHR as they do not satisfy criterion (d)/(4) and lack integrity. Both historic resources have been previously reviewed and determined not eligible for the NRHP. No other resources were located in Group C.

6.0 INDIVIDUALS GROUP AND AGENCY PARTICIPATION

The Native American Heritage Commission (NAHC) was contacted for a search of the *Sacred Lands File* (Busby 2020). The NAHC response was positive with the recommendation that the *Mishewal-Wappo Tribe of Alexander Valley,* one of the six individuals/groups listed as having additional knowledge, be contacted for more information (Fonseca 2020). Communications soliciting additional information were sent to the six Native American individuals/groups recommended by the NAHC **(**Busby 2020b-g) (see Attachments). Four of the five are federally recognized tribes by the U.S. Bureau of Indian Affairs (USDI/BIA 2020).

Charlie Wright, Chairperson, *Kletsel Dehe Band of Wintun Indians*; a Federally tribe previously listed as the *Cortina Indian Rancheria* and the *Cortina Indian Rancheria of Wintun Indians of California;*

Merelene Sanchez, Chairperson, *Guidiville Indian Rancheria;* a Federal tribe;

Jose Simon III, Chairperson, *Middletown Rancheria of Pomo Indians of California*, a Federally recognized tribe;

Sally Peterson, THPO, *Middletown Rancheria of Pomo Indians of California*, a Federally recognized tribe;

Scott Gabaldon, Chairperson, *Mishewal-Wappo Tribe of Alexander Valley;* and,

Anthony Roberts, Chairperson, *Yocha Dehe Wintun Nation*, a Federally tribe previously listed as the *Rumsey Indian Rancheria of Wintun Indians of California*.

No responses were received. A follow-up telephone call was made to Chairperson Gabaldon, *Mishewal-Wappo Tribe of Alexander Valley* in regard to the SLF results from the NAHC. No response was received.

6.1 OTHER CONSULTATION

Mr. Jeremey Sarrow, Watershed & Flood Control Resources Specialist, Napa County Flood Control District provided background information on the project and Bale Slough. Mr. Syd

Temple, Questa Engineering, provided information on the restoration project. No other individuals, agencies, departments or local historical societies were contacted

7.0 FINDING OF EFFECT

A reasonable and good faith effort has been made to identify historic properties listed, determined, or potentially eligible for inclusion on the NRHP (36 CFR Part 800.4) within or immediately adjacent to the APE pursuant to the NHPA of 1966 (as amended) (54 U.S.C. § 306108) and its implementing regulations 36 CFR Part 800. The identification effort included: (1) an archival record search; (2) two field inventories; (3) a backhoe presence/absence testing program within Group A; and, (4) outreach to local Native American tribes and individuals.

The regulations implementing Section 106 define an effect as any action that would alter the characteristics of the property that may qualify the property for inclusion in the NRHP and, diminish the integrity of a property's location, setting, design, materials, workmanship, feeling or association (36 CFR Part 800.5(a)(1-2). A finding of *No Adverse Effect* (36 CFR Part 800.5(b)) is recommended as the proposed improvements (undertaking) will have no adverse effect on any historic properties as defined in 36 CFR Part 800.5(a)(1).

7.1 IDENTIFIED RESOURCES AND EVALUATIONS

Seven recorded cultural resources have been recorded or immediately adjacent to the APE. Five are prehistoric resources (Group A and Group C) and two are historic sites (Group C). The prehistoric archaeological resources, generally noted by the presence of light obsidian debitage and a few chipped and ground stone objects, have been identified as seasonal, temporary camps. The two historic sites are railroad alignments associated with the Napa Valley Railroad.

The field inventory relocated the one prehistoric site (NAP-144) in Group A and none of the four prehistoric resources (NAP-590, NAP-591, NAP-592 and NAP-593) within Group C. All of the prehistoric resources have been impacted from past and ongoing agricultural operations. In the case of Group C, land levelling for vineyard development after the recordation of the four sites has resulted in their destruction. Consequently, none of the five prehistoric resources within the APE appear eligible for the NRHP or the CRHR as they do not satisfy criterion (d)/(4) and lack integrity.

P-28-001547, the Napa Valley Railroad District, is within the APE while P-28-00966, an element of the Napa Valley Railroad Line, is adjacent. Both historic resources have been previously reviewed and determined not eligible for the NRHP as part of the studies completed for the Napa Valley Wine Train (Napa Valley Wine Train Railroad 6Y, 11/22/2006, FHWA061024A).

7.2 SUMMARY

A finding of *No Adverse Effect* (36 CFR Part 800.5(b)) is recommended as the proposed restoration project (undertaking) will have no adverse effect on any historic properties as defined in 36 CFR Part 800.5(a)(1).

8.0 RECOMMENDATIONS

- The development of a formal *Post-Review Discovery Plan* is not recommended due to the low potential for exposing significant prehistoric or historic cultural material within the APE.

- It is recommended that the project proponent develop and initiate archaeological sensitivity training for any construction personnel involved with ground disturbing construction. The training shall cover identification of potential archaeological materials that could occur within the APE, protocols to follow in the event of a potential unexpected discovery including stop work procedures, notifications and expectations for continuing construction operations. The training shall be provided by a Professional Archaeologist.

- In the event of post-review discoveries of cultural resources,[5] the U.S. Army Corps of Engineers (USACE), shall be notified so that any discoveries may be treated in accordance with 36 CFR Part 800.13(b).

- If Native American remains are exposed during project construction, all work in that area must halt and the Napa County Medical Examiner must be contacted, pursuant to California Public Resources Code Sections 5097.94, 5097.98, and 5097.99.

---

5. Significant prehistoric cultural materials may include:

a. Human bone - either isolated or intact burials.
b. Habitation (occupation or ceremonial structures as interpreted from rock rings/features, distinct ground depressions, differences in compaction (e.g., house floors).
c. Artifacts including chipped stone objects such as projectile points and bifaces; groundstone artifacts such as manos, metates, mortars, pestles, grinding stones, pitted hammerstones; and, shell and bone artifacts including ornaments and beads.
d. Various features and samples including hearths (fire-cracked rock; baked and vitrified clay), artifact caches, faunal and shellfish remains (which permit dietary reconstruction), distinctive changes in soil stratigraphy indicative of prehistoric activities.
e. Isolated artifacts

Significant historic cultural materials may include finds from the late 19th through early 20th centuries. Objects and features associated with the Historic Period can include.

f. Structural remains or portions of foundations (bricks, cobbles/boulders, stacked field stone, postholes, etc.).
g. Trash pits, privies, wells and associated artifacts.
h. Isolated artifacts or isolated clusters of manufactured artifacts (e.g., glass bottles, metal cans, manufactured wood items, etc.).
i. Human remains.

In addition, cultural materials including both artifacts and structures that can be attributed to Hispanic, Asian and other ethnic or racial groups are potentially significant. Such features or clusters of artifacts and samples include remains of structures, trash pits, and privies.

9.0 REFERENCES CITED AND CONSULTED[6]

Amaroli, P.
1982 An Archaeological Investigation at CA-SON-995, Sonoma County, California. MS on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Anonymous/Source Unknown
1960 Archaeological Site Survey Record P-28-000136 (CA-Nap-144). Copy on file at Basin Research Associates, San Leandro.

Anonymous
ca. 1980 Cultural Resources Investigation of Operating Projects Napa River Basin. MS on file, S-2154, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Anonymous/Author not stated
ca. 2020 Saving Napa's Rail Line. https://www.wintrain.com/the-wine-train/saving-napsa-rail -line accessed 7/29/2020.

Archaeological Consulting and Research Service, Inc.
1978 Report of Archaeological Excavations at The River Glen Site (CA-Nap-261), Napa County, California. MS on file, S-1227, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Barrett, S.A.
1908 The Ethnogeography of the Pomo and Neighboring Indians. University of California Publications in American Archaeology and Ethnology 6(1).

Beck, W.A. and Y.D. Haase
1974 Historical Atlas of California (Third printing). University of Oklahoma Press, Norman.

Bennyhoff, J.A.
1977 Ethnogeography of the Plains Miwok. Center for Archaeological Research at Davis Publication 5.

1994 The Napa District and Wappo Prehistory. In Toward a new Taxonomic Framework for Central California Archaeology. Essays by James A. Bennyhoff and David A. Fredrickson, assembled and edited by Richard E. Hughes, pp. 49-56. Contributions of the University of California Archaeological Research Facility 52.

Bennyhoff, J.A. and D.A. Fredrickson
1994 A Proposed Integrative Taxonomic System for Central California Archaeology. In Toward a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson, edited

6. Excluding most references listed in Table 5.1 Studies Within/Adjacent To or Within 0.25 Mile of the APE and Table 5.2 Resources Within/Adjacent To or Within 0.25 Mile of the APE

by Richard E. Hughes, pp. 15-24. Contributions of the University of California Archaeological Research Facility 52.

Bennyhoff, James A. and Richard E. Hughes
1987 Shell Bead and Ornament Exchange Networks between California and the Western Great Basin. Anthropological Papers of the American Museum of Natural History Vol. 64 (part 2).

Busby, Colin I. (Basin Research Associates, San Leandro)
2020a Request to Native American Heritage Commission for Review of Sacred Lands File & Native American Contacts List, Bale Slough Flood Control and Wetlands Expansion, Napa County. July 16, 2020.

2020b-g Communications to: Charlie Wright, Chairperson, Cortina Rancheria – Kletsel Dehe Band of Wintun Indians, Williams [letter via US Postal Service]; Merlene Sanchez, Chairperson, Guidiville Indian Rancheria, Talmage; Sally Peterson, THPO [Tribal Historic Preservation Officer], Middletown Rancheria, Middletown; Jose Simon, Chairperson, Middletown Rancheria of Pomo Indians, Middletown; Scott Gabaldon, Chairperson, Mishewal-Wappo Tribe of Alexander Valley, Windsor; and Anthony Roberts, Chairperson, Yocha Dehe Wintun Nation, Brooks. Regarding: Request for Information: Napa Flood Control Project Bale Slough Flood Control and Wetlands Expansion, Near Rutherford, Napa County. Dated July 24, 2020.

California State Automobile Association **(CA-AAA)**
2005 City Series. Napa Valley. Map #2078.

California (State of), Department of Parks and Recreation, Office of Historic Preservation **(CAL/OHP)**
1973 The California History Plan. Volume One - Comprehensive Preservation Program. Volume Two - Inventory of Historic Features.

1976 California Inventory of Historic Resources.

1988 Five Views: An Ethnic Sites Survey for California.

1990 California Historical Landmarks.

1992 California Points of Historical Interest [with updates]. May 1, 1992.

2012 [Historic Properties Directory] Directory of Properties in the Historic Property Data file for Napa County (includes National Register of Historic Places status codes, California Historical Landmarks and California Points of Historical Interest listings, etc.). Dated 4/05/2012 [most recent as of 8/26/2019].

2012/2020 *Archeological Determinations of Eligibility* for Napa County [base dated 4/05/2012 with annotation; most recent as of 8/14/2020].

2020a *OHP [*Office of Historic Preservation] *Built Environment Resources Directory* (BERD) for Napa Count. Web, accessed 8/19/2020

2020b *Listed California Historical Resources* – Napa County [including National Register, State Landmark, California Register, and Point of Interest]. <http://ohp.parks.ca.gov/ListedResources/?view=county&criteria=28> Web, accessed 8/05/2020.

Carpenter, E.J. and S.W. Cosby
1938 Soil Survey of the Napa Area, California. United States Department of Agriculture, Bureau of Chemistry and Soils (in cooperation with University of California Agricultural Experiment Station). Ser. 1933, No. 13. Washington.

Cook, Sherburne F.
1956 The Aboriginal Population of the North Coast of California. University of California Anthropological Records 16(3).

Coy, W.C.
1973 California County Boundaries: A Study of the Division of the State into Counties and the Subsequent Changes in their Boundaries (Revised edition). California Historical Survey Commission. Valley Publishers, Fresno.

Driver, Harold E.
1936 Wappo Ethnography. University of California Publications in American Archaeology and Ethnology 36(3):179-220.

Elsasser, Albert B.
1978 Development of Regional Prehistoric Cultures. In *California*, edited by R. F. Heizer, Volume 8. Handbook of North American Indians, W.G. Sturtevant, general editor, pp. 37-57. Smithsonian Institution, Washington, D. C.

Environmental Science Associates (ESA)
2019 Bale Slough – Bear Creek Restoration Project. Prepared for Napa County Resource Conservation District. Final 30% Design Plans. Dated February 2019. Copy on file, Basin Research Associates, San Leandro.

Fickewirth, Alvin A.
1992 California Railroads: An Encyclopedia of Cable Car, Common Carrier, Horsecar, Industrial Interurban, Logging, Monorail, Motor Road, Short Lines, Streetcar, Switching and Terminal Railroad in California (1851-1992). Golden West Books, San Marino.

Flynn, Katherine.
1981a Archaeological Survey, Beaulieu Vineyard, Rutherford, California. MS on file, S-02505, CHRIS/NWIC, Sonoma State University, Rohnert Park.

1981b P-28-000470 (CA-NAP-588) – Wastewater Pond Site. Site form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

1981c Archaeological reconnaissance of a 60 acre vineyard parcel located at 1695 St. Helena Highway. MS on file, S-02483, CHRIS/NWIC, Sonoma State University, Rohnert Park.

1982 Archaeological Monitoring Activity During Industrial Wastewater Pipeline Excavation, Beaulieu Vineyard. MS on file, S-02505a, CHRIS/NWIC, Sonoma State University, Rohnert Park

Flynn, Katherine and T. Marks

1981 P-28-000472 (CA-NAP-590) – Vineyard Mound Site. Site form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Fonseca, Sarah (Cultural Resources Analyst, Native American Heritage Commission, Sacramento) **(NAHC)**

2020 Response - Review of Sacred Lands Native American Heritage Commission Sacred Lands File & Native American Contacts List] Bale Slough Flood Control and Wetlands Expansion Project, Napa County. Dated July 21, 2020.

Fredrickson, David A.

1951 Archaeological Site Survey Record P-28-000136 (CA-Nap-144). Site form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

1967 Appraisal of the Archaeological Resources of the Napa River (Trancas Road to Edgerly Island) and Three Potential Reservoir Areas in the Napa River Basin. MS on file, S-4, CHRIS/NWIC, Sonoma State University, Rohnert Park.

1973 Early Cultures of the North Coast Ranges, California. Unpublished doctoral dissertation, Department of Anthropology, University of California, Davis.

1974 Cultural Diversity in Early Central California: A View from the North Coast Ranges. Journal of California Anthropology 1(1):41-53.

1994a Spatial and Cultural Units in Central California Archaeology. In Toward a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson, edited by Richard E. Hughes, pp. 25-47. Contributions of the University of California Archaeological Research Facility 52.

1994b Archaeological Taxonomy in Central California Reconsidered. In Toward a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson, edited by Richard E. Hughes, pp.93-104. Contributions of the University of California Archaeological Research Facility 52.

Germano, Vida (Caltrans District 4)

2006 District Record form, P-28-001547 (formerly assigned P-28-000966; Napa Valley Railroad, Napa Valley Wine Train segment from Rutherford train depot to St. Helena train depot). On file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Germano, Vida and Noah Stewart (Caltrans District 4)
2006a Primary Record form, P-28-001547 (formerly assigned P-28-000966; Napa Valley Railroad, Napa Valley Wine Train segment from Rutherford train depot to St. Helena train depot). On file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

2006b P-28-000966 (CA-NAP-1113H) – Southern Pacific Railroad. Site form (Update) on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Greengo, R. and D. Shulter
1953 Historical Background. In The Archaeology of the Napa Region, University of California Anthropological Records 12(6):229-232, edited by Robert F. Heizer.

Goddard, George
1857 Britton & Rey's Map of the State of California. Britton and Rey, San Francisco. Reprinted by The Friends of the Bancroft, University of California, Berkeley.

Golla, Victor
2007 Chapter 6. Linguistic Prehistory. In California Prehistory: Colonization, Culture, and Complexity, edited by Terry L. Jones and Kathryn A. Klar, pp. 71-82. Altamira Press, New York.

Greengo, R. and D. Shulter
1953 Historical Background. In The Archaeology of the Napa Region, University of California Anthropological Records 12(6):229-232, edited by Robert F. Heizer.

Grinnell, Joseph
1935 A Revised Life-Zone Map of California. University of California Publications in Zoology 40:327-330.

Grossinger, Robin (with Design and Cartography by Ruth Askevold)
2012 Napa Valley Historical Ecology Atlas: Exploring a Hidden Landscape of Transformation and Resilience. San Francisco Estuary Institute, University of California Press, Berkeley.

Gudde, Erwin G.
1998 California Place Names: The Origin and Etymology of Current Geographical Names. Fourth Edition, revised and enlarged by William Bright. University of California Press, Berkeley.

Hart, James D.
1987 A Companion to California (revised and expanded). Oxford University Press, New York.

Hayes, John F.
1984 Knight's Valley Archaeological Project. Archaeological Test Excavations at CA-SON-1976/H and CA-SON-1978 for the Replacement Bridges at Macama Creek and Redwood Creek, State Route 128, Sonoma County. Draft Prepared for Caltrans District 4.

Heizer, Robert F. (editor)
1953 The Archaeology of the Napa Region. University of California Anthropological Records 12(6).

Hendry, G.W. and J.N. Bowman
1940 The Spanish and Mexican Adobe and Other Buildings in the Nine San Francisco Bay Counties, 1776 to about 1850 [including [map of] Napa County]. MS on file, Bancroft Library, University of California, Berkeley.

Hoover, Mildred, Hero Rensch, Ethel Rensch, William Abeloe
1966 Historic Spots of California (third edition). Stanford University Press, Stanford.

Hughes, Richard E. (compiler and editor)
1994 Toward a New Taxonomic Framework for Central California Archaeology. Essays by James A. Bennyhoff and David A. Fredrickson. Contributions of the University of California Archaeological Research Facility 52.

ICF
2010 Draft Archaeological Treatment Plan for the Napa Rutherford Restoration Project, Napa County, California. Prepared for the Napa County Resource Conservation District, Napa, CA. Copy on file, Basin Research Associates, San Leandro.

Jenkins, O.P.
1941 Geomorphic provinces of California. California Division of Mines Bulletin 118(2):83-88.

Jones, Terry L. and Kathryn A. Klar (editors)
2007 California Prehistory: Colonization, Culture, and Complexity. Altamira Press, New York.

King, Chester
1978 Protohistoric and Historic Archaeology. In *California*, edited by R. F. Heizer, Volume 8. Handbook of North American Indians, W.G. Sturtevant, general editor, pp. 58-68. Smithsonian Institution, Washington, D.C.

King, Gregory
1986 Historic Resource Evaluation Report on Former Napa Valley Railroad Line O4-NAP-29 P.M. 22.2/28.4 04226-111330. MS on file, S-16849, CHRIS/NWIC, Sonoma State University, Rohnert Park.

King, Norton L.
1967 Napa County - An Historical Overview (printed 1973). Office of Napa County Superintendent of Schools, n.p.

Kroeber, A.L.
1925 Handbook of the Indians of California. Bureau of American Ethnology, Bulletin 78. Government Printing Office, Washington D.C.

1932 The Patwin and Their Neighbors. University of California Publications in American Archaeology and Ethnology 29(4):253-423.

Kuchler, A.W.
1977 Map of the Natural Vegetation of California. Department of Geography, University of Kansas, Lawrence. In Terrestrial Vegetation of California (new expanded edition, 1988), edited by Michael G. Barbour and Jack Major. California Native Plant Society, Special Publication Number 9.

Kyle, Douglas E.
2002 Historic Spots in California (fifth edition of M.B. Hoover, H.E. Rensch, E.G. Rensch and W.N. Abeloe). Stanford University Press, Stanford.

Marks, T.
1981 P-28-000473 (CA-NAP-591) – Trench Site. Site form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Martin, T. and J. Meyer
2005 Archaeological Data Recovery at the Napa Creek Site (CA-NAP-916), State Route 29, Napa, California. Prepared for California Department of Transportation, District 4, Oakland**.**

McClellan, C.
1953 Ethnography of the Wappo and Patwin. In The Archaeology of the Napa Region, University of California Anthropological Records 12(6):233-241.

Menefee, C.A.
1873 Historical and Descriptive Sketch Book of Napa, Sonoma, Lake and Mendocino. Reporter Publishing House, Napa City. Reprinted by California History Books, n.p.

Mikulik, C. (CHRIS/NWIC staff)
2014 Metadata Sheet. P-27-002923 (Southern Pacific Railroad, recorded discontinuously in 7 counties including Napa, assigned P-28-000966). On file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Milliken, Randall T.
1978 Ethno-History of the Lower Napa Valley. In Report of Archaeological Excavations at the River Glen Site (CA-Nap-261), Napa County, California by

Archaeological Consulting and Research Service, Inc. MS on file, S-1227, CHRIS/NWIC, Sonoma State University, Rohnert Park.

1995 A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area 1769-1810. Ballena Press Anthropological Papers No. 43.

2006 The Central California Ethnographic Community Distribution Model, Version 2.0, with Special Attention to the San Francisco Bay Area. Cultural Resources Inventory of Caltrans District 4 Rural Conventional Highways. MS on file, S-32596, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Milliken, Randall T. and James A. Bennyhoff

1993 Temporal Changes in Beads as Prehistoric California Grave Goods. In There Grows a Green Tree: Papers in Honor of David A. Fredrickson, edited by Greg White, Pat Mikkelsen, William R. Hildebrandt and Mark E. Basgall, pp. 381-395. Center for Archaeological Research at Davis, Publication 11.

Milliken, Randall T., Richard T. Fitzgerald, Mark G. Hylkema, Randy Groza, Thomas Origer, David G. Bieling, Alan Leventhal, Randy S. Wiberg, Andrew Gottsfield, Donna Gillette, Viviana Bellefemine, Eric, Strother, Robert Cartier, and David A. Fredrickson

2007 Chapter 8. Punctuated Change in San Francisco Bay Area [Prehistory]. In California Prehistory: Colonization, Culture, and Complexity, edited by Terry L. Jones and Kathryn A. Klar, pp. 99-123. Altamira Press, New York.

Moratto, Michael J.

1984 California Archaeology. Academic Press, New York.

Napa County Board of Supervisors

1887 Facsimile Map of Napa County. In The Resources of Napa County, Illustrated & Described. On file, Basin Research Associates, San Leandro.

Napa County Department of Conservation, Development & Planning

2008/2013 Napa County General Plan [and Amendments]. Web, accessed 8/07/2020.

Napa County Historical Society

1978/1989 Lists of Historic Resources Inventory forms. Unincorporated areas (Source: Master List of historic properties completed 1978 and 1989). Web, accessed 8/7/2020

Neal, Annette (CHRIS/NWIC Staff Researcher)

2020 Records Search Results. Regarding: Bale Slough Napa [County]. CHRIS/NWIC File No. No. 20-0072. Dated August 14, 2020. Copy on file, Basin Research Associates, San Leandro.

Patera, E.L. (editor)

1991 H.E. Salley History of California Post Offices 1849-1990 (Second edition). The Depot, n.p. (Salley, H.E. and E.L. Patera, researchers).

Perez, Crisostomo M.
1996 Land Grants in Alta California: A Compilation of Spanish and Mexican private land claims in the State of California. Landmark Enterprises, Rancho Cordova.

Robertson, Donald B.
1998 Encyclopedia of Western Railroad History. Volume IV California. The Caxton Printers, Ltd, Caldwell, Idaho.

Sawyer, J.O.
1978 Wappo. In *California*, edited by R.F. Heizer, Volume 8. Handbook of North American Indians, W.G. Sturtevant, general editor, pp. 256-263. Smithsonian Institution, Washington D.C.

Slocum, Bowen & Co.
1881 History of Napa and Lake Counties, California. Slocum, Bowen & Co., San Francisco

Smith & Elliott
1878 Map of Napa and Surrounding Country. Map on file, Basin Research Associates, San Leandro.

Stoll, Milton W., Jr.
1960a Napa Valley Archaeological Survey. June 1, 1960. MS on file, S-12739, CHRIS/NWIC, Sonoma State University, Rohnert Park

1960b P-28-000136 (CA-NAP-144). Site form (Supplement) on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

True, Delbert L., Martin A. Baumhoff, and J.E. Hellen
1979 Milling Stone Cultures in Northern California: Berryessa I. Journal of California and Great Basin Anthropology 1(1):124-154.

United States Army Corps of Engineers, Sacramento District and Napa County Flood Control and Water Conservation District **(USCOE)**
1998 Draft Final Supplemental Environmental Impact Statement/Environmental Impact Report [EIS/EIR]. Napa River/Napa Creek Flood Reduction Project. November US Army Corps of Engineers, Sacramento District and Napa County Flood Control and Water Conservation District.

United States Army Corps of Engineers, U.S. Army **(USCOE)**
1915 Tactical Map. Sonoma quadrangle. Topographic map, 15 minute series.

1942 Sonoma Quadrangle. Grid Zone "G." Topographic map, 15 minute series.

United States Bureau of Land Management, General Land Office (**USBLM/GLO)**
1853-1868 Survey Plat. Township No. 7 North, Range No. 5 West, Mount Diablo Meridian. Facsimile on file, Basin Research Associates, San Leandro.

United States Department of Interior Bureau of Indian Affairs **(USDI/BIA)**

2020 Indian Entities Recognized and Eligible to Receive Services from the United States Bureau of Indian Affairs. Federal Register: Volume 85, Number 20, Notices, Page 5462-5467. Web accessed 7/29/2020.

United States Department of Interior, Geological Survey **(USGS)**

1902 Napa, Calif. [Quadrangle]. Topographic map, 15 minute series (surveyed 1896 and 1899, reprinted 1909 and reprinted 1932).

1942 Sonoma Quadrangle. Grid Zone "G." Topographic map, 15 minute series.

1973 Rutherford, Calif. [Quadrangle]. Topographic map, 7.5 minute series. Scale 1/24000 (1951, photorevised 1968, photo inspected 1973). United States Geological Survey, Menlo Park (1951 photorevised).

Weber, Lin

1998 Old Napa Valley: The History to 1900. Wine Ventures Publishing, St. Helena.

United States Department of the Interior, National Park Service (**USNPS**)

2020 National Register of Historic Places Spreadsheet listings. https://wwww.nps.gov/subjects/nationalregister/database-reserch.htm Listed properties (current to 1/8/2020). National Historic Landmarks (NHLs; current to 12/2017). Multiple Property covers (current to 7/2015). Web, accessed 8/05/2020.

Walker, Mike

2009 SPV's [Steam Powered Video's] Comprehensive Railroad Atlas of North America. California and Nevada. Stuart Andrews, SPV, Kent, England.

Watershed Information & Conservation Council **(WI&CC)**

2005 Napa County Baseline Data Report [BDR]. Chapter 14 Cultural Resources (Includes Historical and Archaeological Resources). November 30, 2005 – Version 1. [Maps 14-1, 14-2 and 14-3 not attached.] Web, accessed 8/07/2020.

Wickstrom, Brian P.

1986 An Archaeological Investigation of Prehistoric Sties CA-SON-1250 and CA-SON-1251, Santa Rosa, Sonoma County, California. MS on file, S-???? CHRIS/NWIC, Sonoma State University, Rohnert Park.

Abbreviations

n.d. no date v.d. various dates N.P. no publisher noted
n.p. no place of publisher noted

CHRIS/NWIC is used for material on file at the California Historical Resources Information System, Northwest Information Center, Sonoma State University, Rohnert Park.

ATTACHMENTS

FIGURES

FIGURE 1	General Project Location (ESRI World Street Map)
FIGURE 2	Area of Potential Effects - T7N R5W unsectioned (USGS Rutherford, Calif. 1973)
FIGURE 3	Area of Potential Effects with Recorded Cultural Resources in the Vicinity
FIGURE 4A	Group A – Area of Potential Effects with Test Unit Locations
FIGURE 4B	Group A – Area of Potential Effects with Test Unit Locations
FIGURE 4C	Group A – Area of Potential Effects with Test Unit Locations
FIGURE 5	Area of Potential Effects with Photo View Locations
FIGURE 6	Group A – view northwest on the south side of Bale Slough
FIGURE 7	Group A – view northwest along the north side of Bale Slough
FIGURE 8	Group A – prehistoric cultural material found on the south side of Bale Slough, within the APE, in the vicinity of P-28-000136
FIGURE 9	Group A – view east on the south side of Bale Slough, in the vicinity of P-28-000136
FIGURE 10	Group A – view northwest within Bale Slough
FIGURE 11	Group A – view east from north end along the south side of Bale Slough
FIGURE 12	Group A – view southeast from north end along the north side of Bale Slough
FIGURE 13	Group B – view northwest from the east end along the south side of Bale Slough
FIGURE 14	Group B – vehicle bridge across Bale Slough constructed from railroad car, view east
FIGURE 15	Group B – view northwest along the north side of Bale Slough
FIGURE 16	Group B – view southeast along the south side of Bale Slough
FIGURE 17	Group B – view east along the north side of Bale Slough from just east of Hwy 29

ATTACHMENTS, con't

FIGURES, con't

FIGURE 18 Group B – view east along the south side of Bale Slough from just east of Hwy 29

FIGURE 19 Group C – Napa Valley Wine train trestle over Bale Slough, view south

FIGURE 20 Group C – view southwest across Site 13 east of Bale Slough from near Hwy 29

FIGURE 21 Group C – view northwest across Site 12 towards Bear Creek from near Hwy 29

FIGURE 22 Group C – view north along the east side of Bear Creek in Site 12

FIGURE 23 Group C – view east across Site 14 from the south end

FIGURE 24 Group C – view northeast toward P-28-000475/NAP-593

FIGURE 25 Group C Fill Area – view west toward general vicinity of P-28-000472/NAP-590

FIGURE 26 Group C Fill Area – visibility within P-28-000472/NAP-590

FIGURE 27 Group C Fill Area – view northwest toward location of P-28-000473/NAP-591

FIGURE 28 Group C Fill Area – view southeast across the fill area

FIGURE 29 Group C Fill Area – view northeast across the fill area

FIGURE 30 Group A – BTU 1, trench during excavation, view to southwest

FIGURE 31 Group A – BTU 1, south wall profile view

FIGURE 32 Group A – BTU 2, trench during excavation, view to southwest

FIGURE 33 Group A – BTU 2, west wall profile view

FIGURE 34 Group A – BTU 3, screened sediments

FIGURE 35 Group A – BTU 3, west wall profile view

FIGURE 36 Group A – BTU 4, trench during excavation with BTU 3 in foreground, view to north

FIGURE 37 Group A – BTU 4, west wall profile view

FIGURE 38 Group A – BTU 5, trench during excavation, view to northwest

FIGURE 39 Group A – BTU 5, west wall profile view

FIGURE 40 Group A – BTU 6, trench during excavation, view to west

FIGURE 41 Group A – BTU 6, west wall profile view

ATTACHMENTS, con't

FIGURES, con't

FIGURE 42	Group A – BTU 7, trench after excavation, view to southwest
FIGURE 43	Group A – BTU 7, west wall profile view
FIGURE 44	Group A – BTU 8, trench during excavation, view to northwest
FIGURE 45	Group A – BTU 8, west wall profile view
FIGURE 46	Group A – BTU 9, trench during excavation, view to northeast
FIGURE 47	Group A – BTU 9, west wall profile view
FIGURE 48	Group A – BTU 10, trench during excavation, view to northwest
FIGURE 49	Group A – BTU 10, west wall profile view
FIGURE 50	Group A – BTU 11, trench during excavation, view to northeast
FIGURE 51	Group A – BTU 11, west wall profile view

NATIVE AMERICAN OUTREACH

LETTER	Request to Native American Heritage Commission
LETTER	Native American Heritage Commission Response
LETTERS	Request to Native Americans Identified by Native American Heritage Commission
RESPONSE	Responses from Native American Outreach

CHRIS/NWIC SEARCH

SEARCH	CHRIS/NWIC File No. 20-0072 (Dated August 14, 2020) [No Confidential Information]

SITE FORM UPDATES (DPR 523)

FORM 1	P-28-000136 (CA-NAP-144
FORM 2	P-28-000472 (CA-NAP-590)
FORM 3	P-28-000473 (CA-NAP-591)
FORM 4	P-28-000474 (CA-NAP-592)
FORM 5	P-28-000475 (CA-NAP-593)

ATTACHMENTS

FIGURES

FIGURE 1	General Project Location (ESRI World Street Map)
FIGURE 2	Area of Potential Effects - T7N R5W unsectioned (USGS Rutherford, Calif. 1973)
FIGURE 3	Area of Potential Effects with Recorded Cultural Resources in the Vicinity
FIGURE 4A	Group A – Area of Potential Effects with Test Unit Locations
FIGURE 4B	Group A – Area of Potential Effects with Test Unit Locations
FIGURE 4C	Group A – Area of Potential Effects with Test Unit Locations
FIGURE 5	Area of Potential Effects with Photo View Locations
FIGURE 6	Group A – view northwest on the south side of Bale Slough
FIGURE 7	Group A – view northwest along the north side of Bale Slough
FIGURE 8	Group A – prehistoric cultural material found on the south side of Bale Slough, within the APE, in the vicinity of P-28-000136
FIGURE 9	Group A – view east on the south side of Bale Slough, in the vicinity of P-28-000136
FIGURE 10	Group A – view northwest within Bale Slough
FIGURE 11	Group A – view east from north end along the south side of Bale Slough
FIGURE 12	Group A – view southeast from north end along the north side of Bale Slough
FIGURE 13	Group B – view northwest from the east end along the south side of Bale Slough
FIGURE 14	Group B – vehicle bridge across Bale Slough constructed from railroad car, view east
FIGURE 15	Group B – view northwest along the north side of Bale Slough
FIGURE 16	Group B – view southeast along the south side of Bale Slough
FIGURE 17	Group B – view east along the north side of Bale Slough from just east of Hwy 29
FIGURE 18	Group B – view east along the south side of Bale Slough from just east of Hwy 29
FIGURE 19	Group C – Napa Valley Wine train trestle over Bale Slough, view south
FIGURE 20	Group C – view southwest across Site 13 east of Bale Slough from near Hwy 29
FIGURE 21	Group C – view northwest across Site 12 towards Bear Creek from near Hwy 29

ATTACHMENTS, con't

FIGURES, con't

FIGURE 22 Group C – view north along the east side of Bear Creek in Site 12

FIGURE 23 Group C – view east across Site 14 from the south end

FIGURE 24 Group C – view northeast toward P-28-000475/NAP-593

FIGURE 25 Group C Fill Area – view west toward general vicinity of P-28-000472/NAP-590

FIGURE 26 Group C Fill Area – visibility within P-28-000472/NAP-590

FIGURE 27 Group C Fill Area – view northwest toward location of P-28-000473/NAP-591

FIGURE 28 Group C Fill Area – view southeast across the fill area

FIGURE 29 Group C Fill Area – view northeast across the fill area

FIGURE 30 Group A – BTU 1, trench during excavation, view to southwest

FIGURE 31 Group A – BTU 1, south wall profile view

FIGURE 32 Group A – BTU 2, trench during excavation, view to southwest

FIGURE 33 Group A – BTU 2, west wall profile view

FIGURE 34 Group A – BTU 3, screened sediments

FIGURE 35 Group A – BTU 3, west wall profile view

FIGURE 36 Group A – BTU 4, trench during excavation with BTU 3 in foreground, view to north

FIGURE 37 Group A – BTU 4, west wall profile view

FIGURE 38 Group A – BTU 5, trench during excavation, view to northwest

FIGURE 39 Group A – BTU 5, west wall profile view

FIGURE 40 Group A – BTU 6, trench during excavation, view to west

FIGURE 41 Group A – BTU 6, west wall profile view

FIGURE 42 Group A – BTU 7, trench after excavation, view to southwest

FIGURE 43 Group A – BTU 7, west wall profile view

FIGURE 44 Group A – BTU 8, trench during excavation, view to northwest

FIGURE 45 Group A – BTU 8, west wall profile view

FIGURE 46 Group A – BTU 9, trench during excavation, view to northeast

FIGURE 47 Group A – BTU 9, west wall profile view

FIGURE 48 Group A – BTU 10, trench during excavation, view to northwest

FIGURE 49 Group A – BTU 10, west wall profile view

FIGURE 50 Group A – BTU 11, trench during excavation, view to northeast

FIGURE 51 Group A – BTU 11, west wall profile view

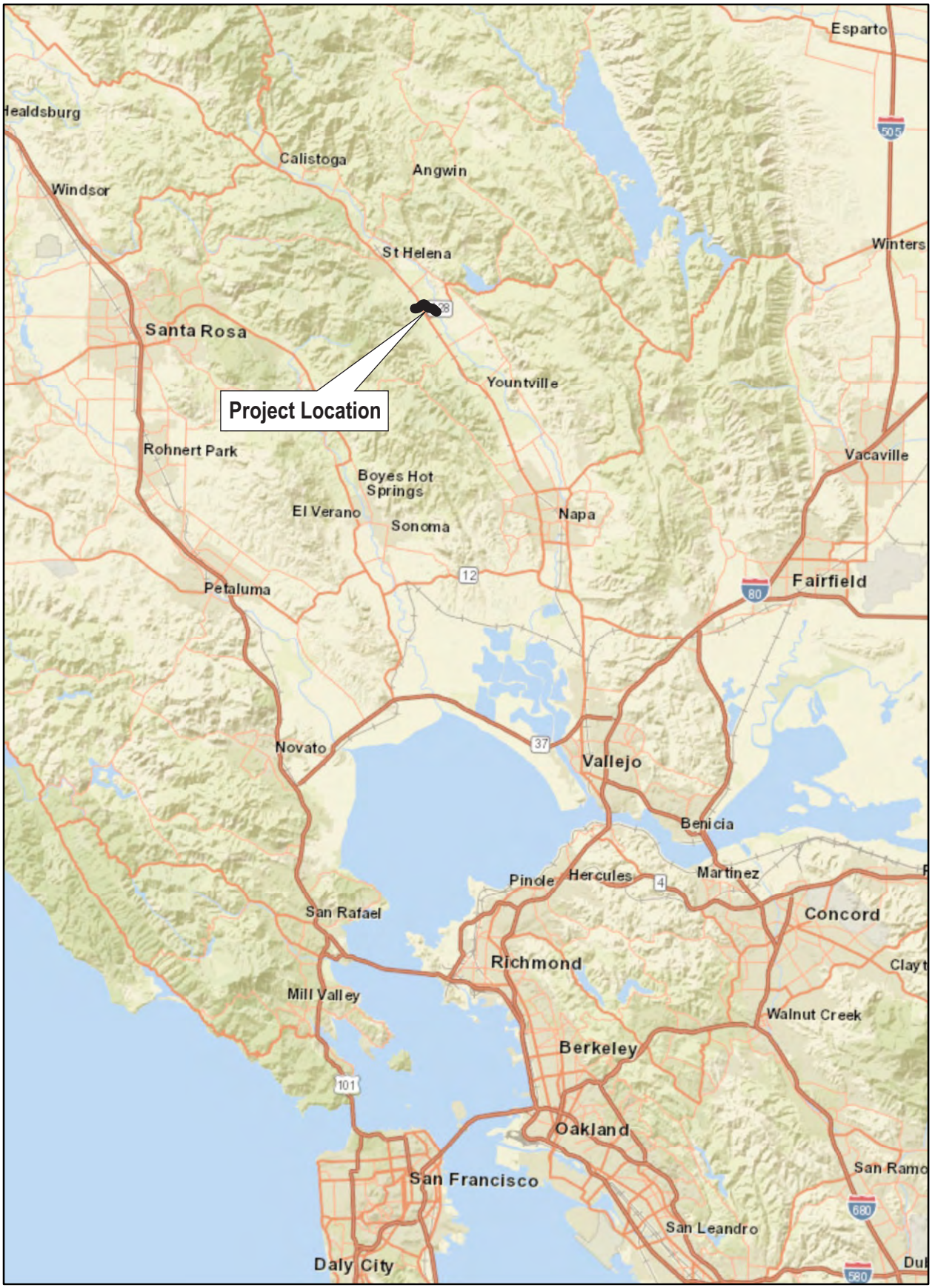


Figure 1: General Project Location (ESRI World Street Map)

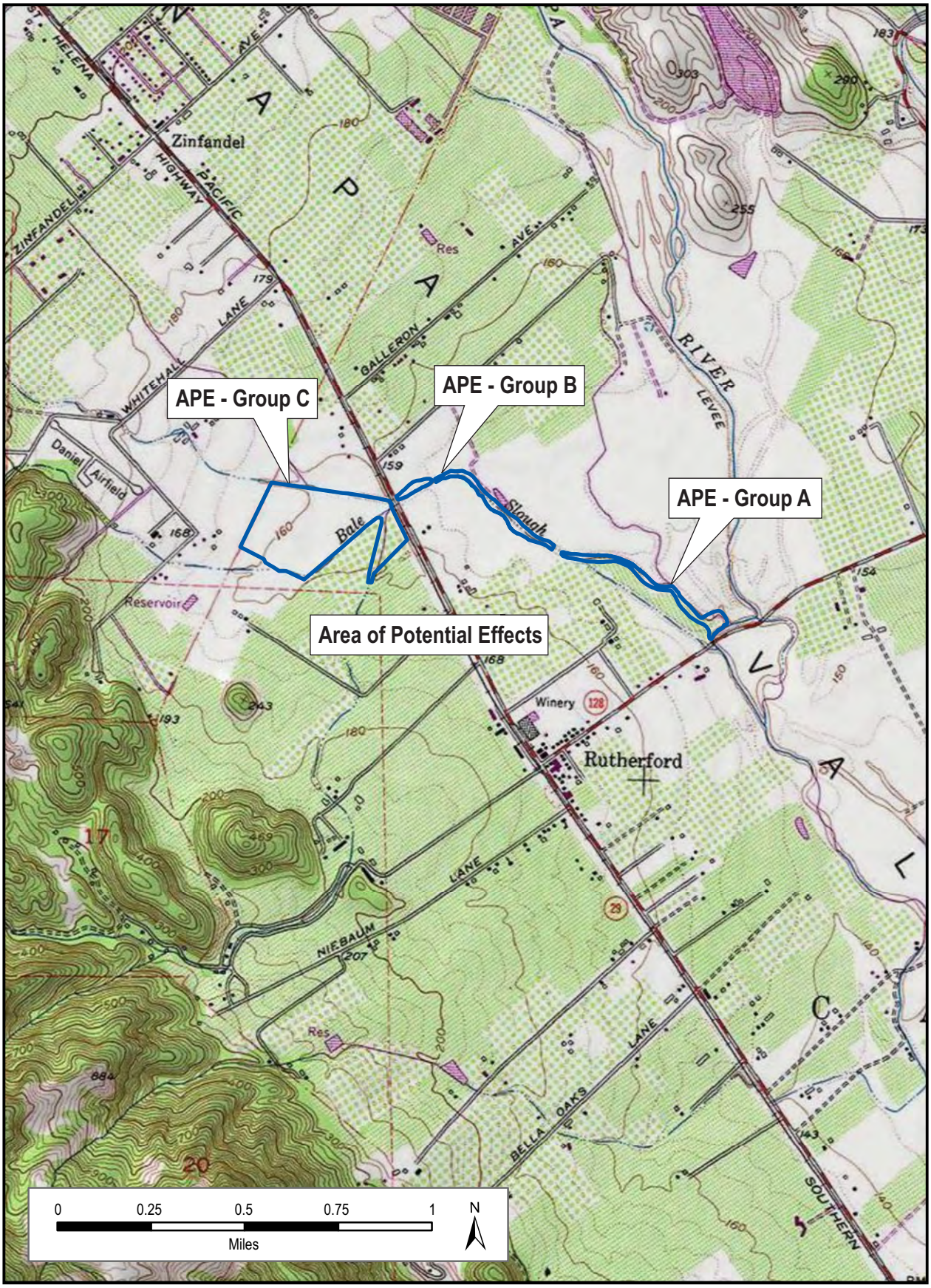


Figure 2: Area of Potential Effects - T7N R5W unsectioned (USGS Rutherford, Calif. 1973)

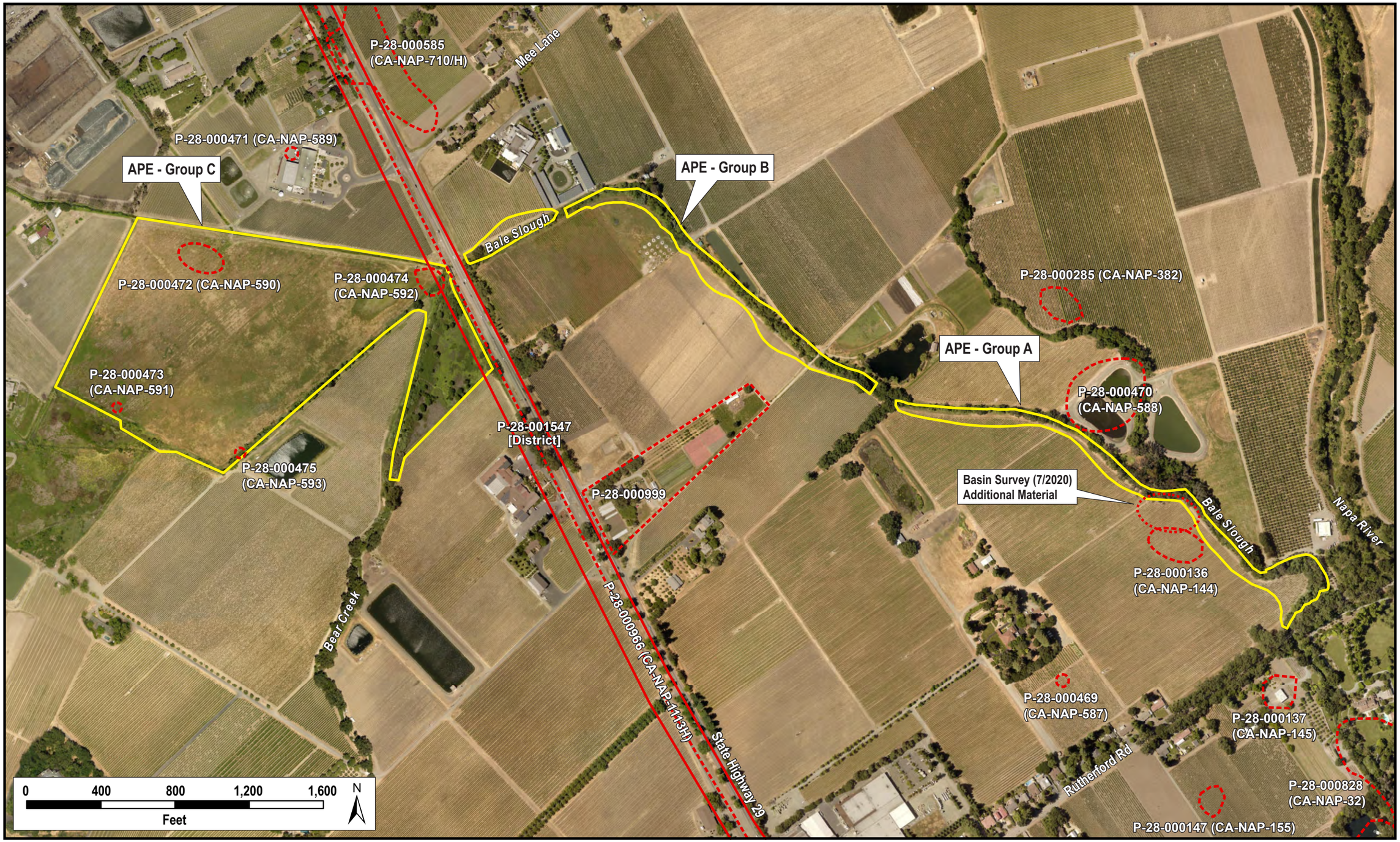
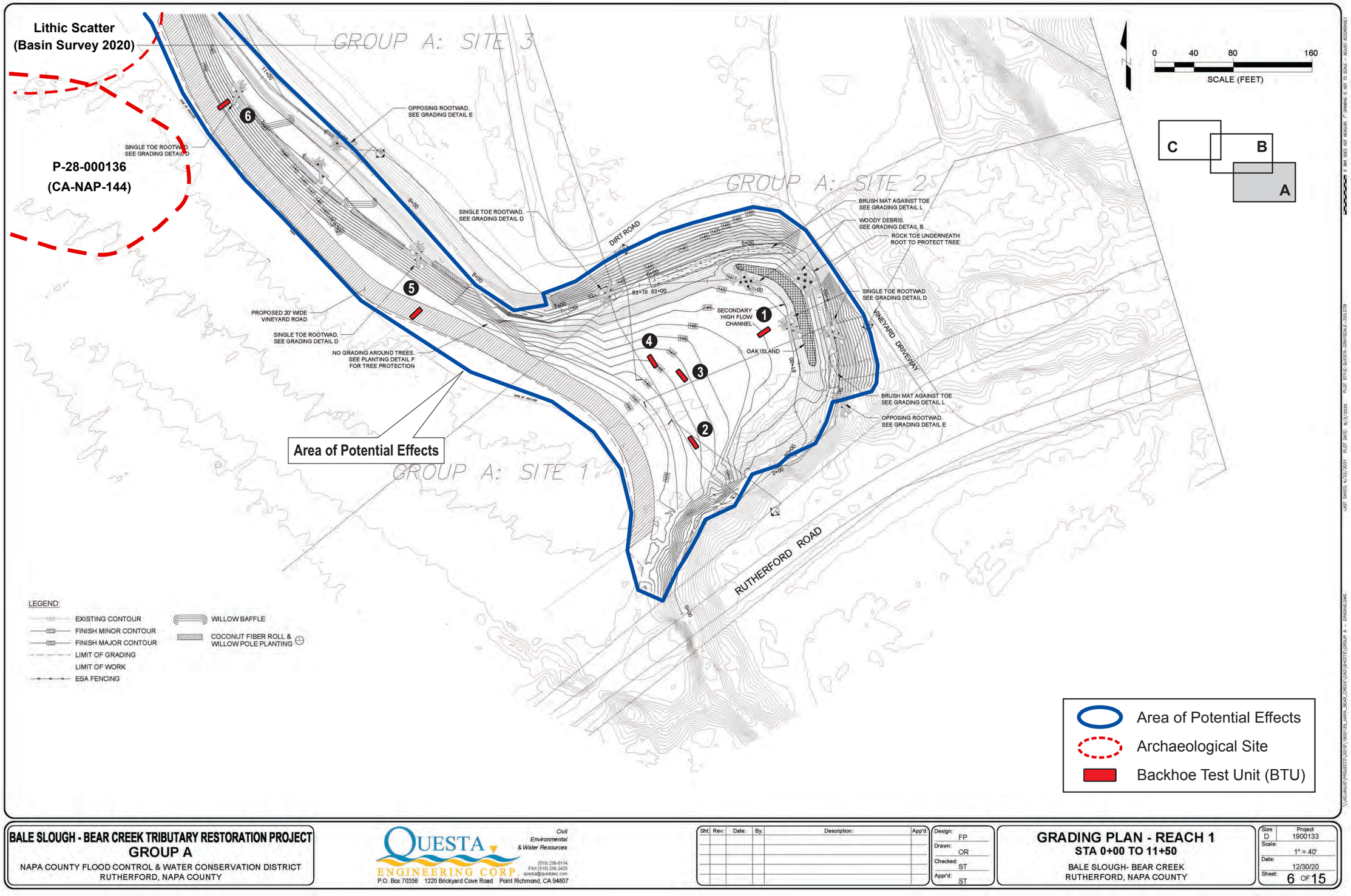


Figure 3: Area of Potential Effects with Recorded Cultural Resources in the Vicinity



BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
(510) 236-6114 FAX (510) 236-2423 questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

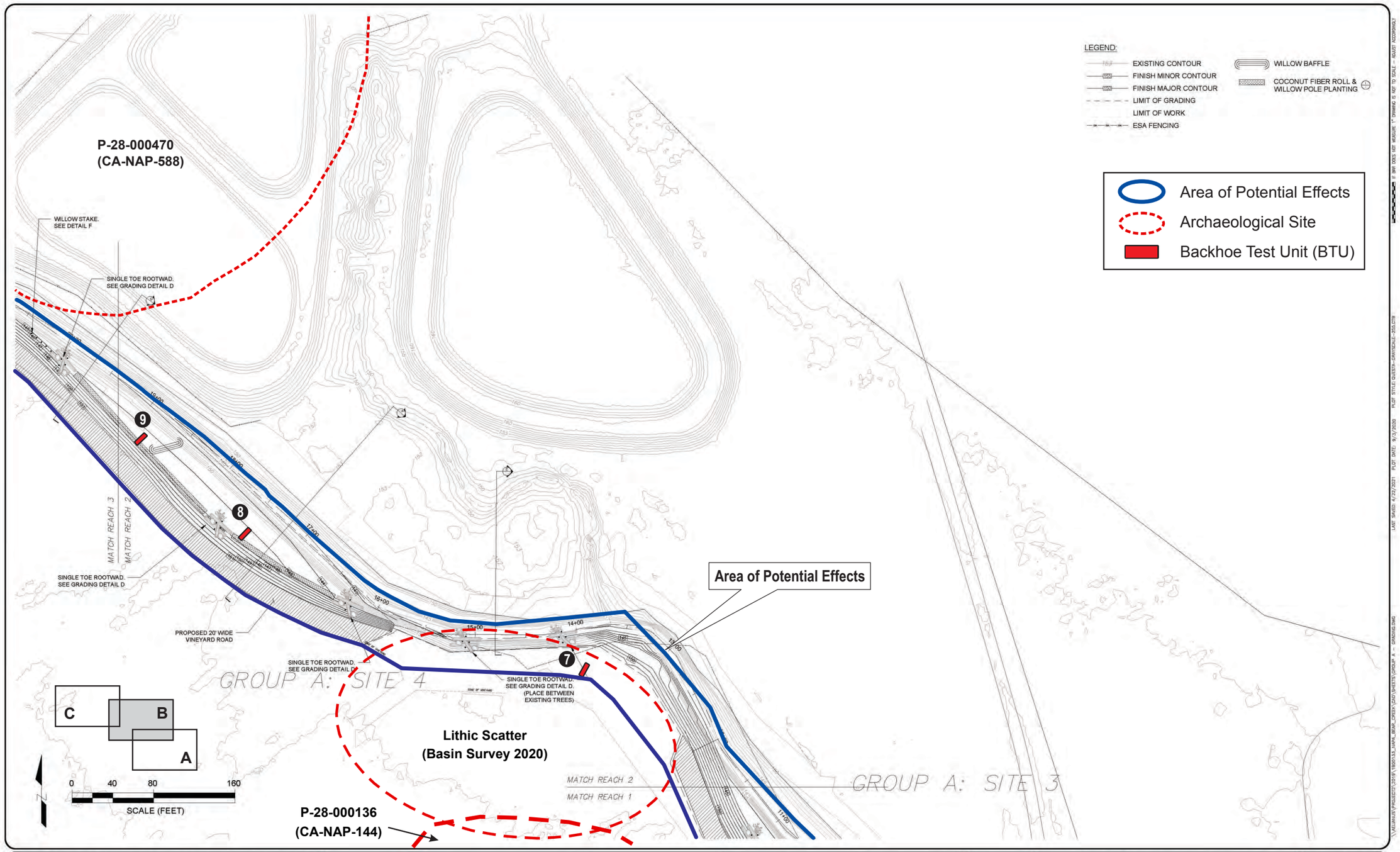
Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING PLAN - REACH 1
STA 0+00 TO 11+50
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size: D | Project: 1900133
Scale: 1" = 40'
Date: 12/30/20
Sheet: 6 OF 15

Figure 4A: Group A - Area of Potential Effects with Test Unit Locations



BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP
Civil Environmental & Water Resources
(510) 236-8114 FAX (510) 236-2423 questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

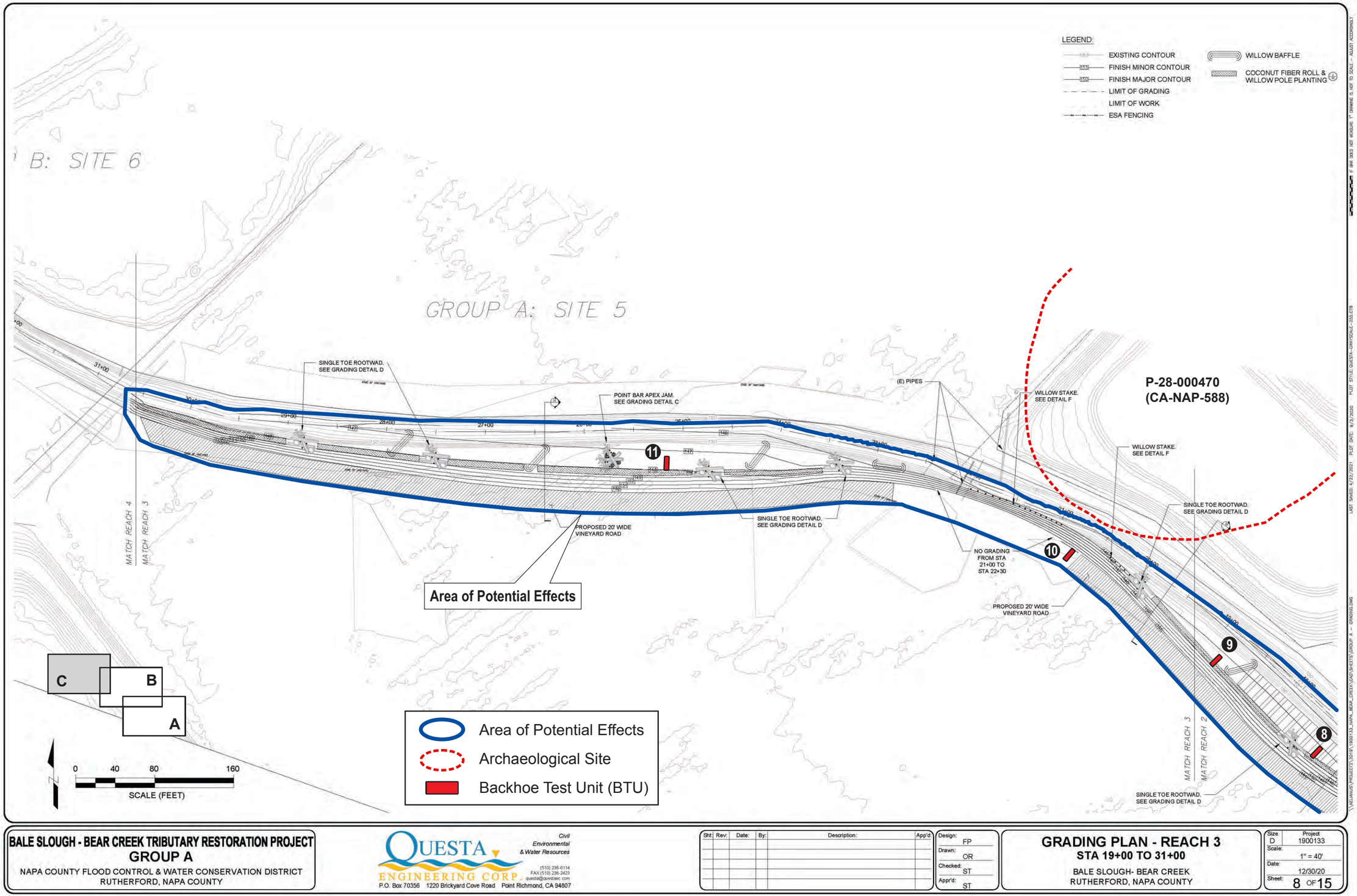
Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING PLAN - REACH 2
STA 11+50 TO 19+00
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 12/30/20
Sheet: 7 OF 15

LAST SAVED: 4/23/2021 PLOT DATE: 9/3/2020 PLOT STYLE: CALSTA--GRAYSCALE--255.CTB
\\JAUMAUS\PROJECT\2019\1900133_NAPA_BEAR_CREEK\CAD SHEETS\GROUP A - GRADING.DWG

Figure 4B: Group A - Area of Potential Effects with Test Unit Locations



BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
GROUP A
NAPA COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
RUTHERFORD, NAPA COUNTY

QUESTA ENGINEERING CORP
Civil Environmental & Water Resources
(510) 236-6114 FAX (510) 236-2423 questa@questaec.com
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Sht:	Rev:	Date:	By:	Description:	App'd:

Design: FP
Drawn: OR
Checked: ST
Appr'd: ST

GRADING PLAN - REACH 3
STA 19+00 TO 31+00
BALE SLOUGH- BEAR CREEK
RUTHERFORD, NAPA COUNTY

Size D | Project 1900133
Scale: 1" = 40'
Date: 12/30/20
Sheet: 8 OF 15

Figure 4C: Group A - Area of Potential Effects with Test Unit Locations

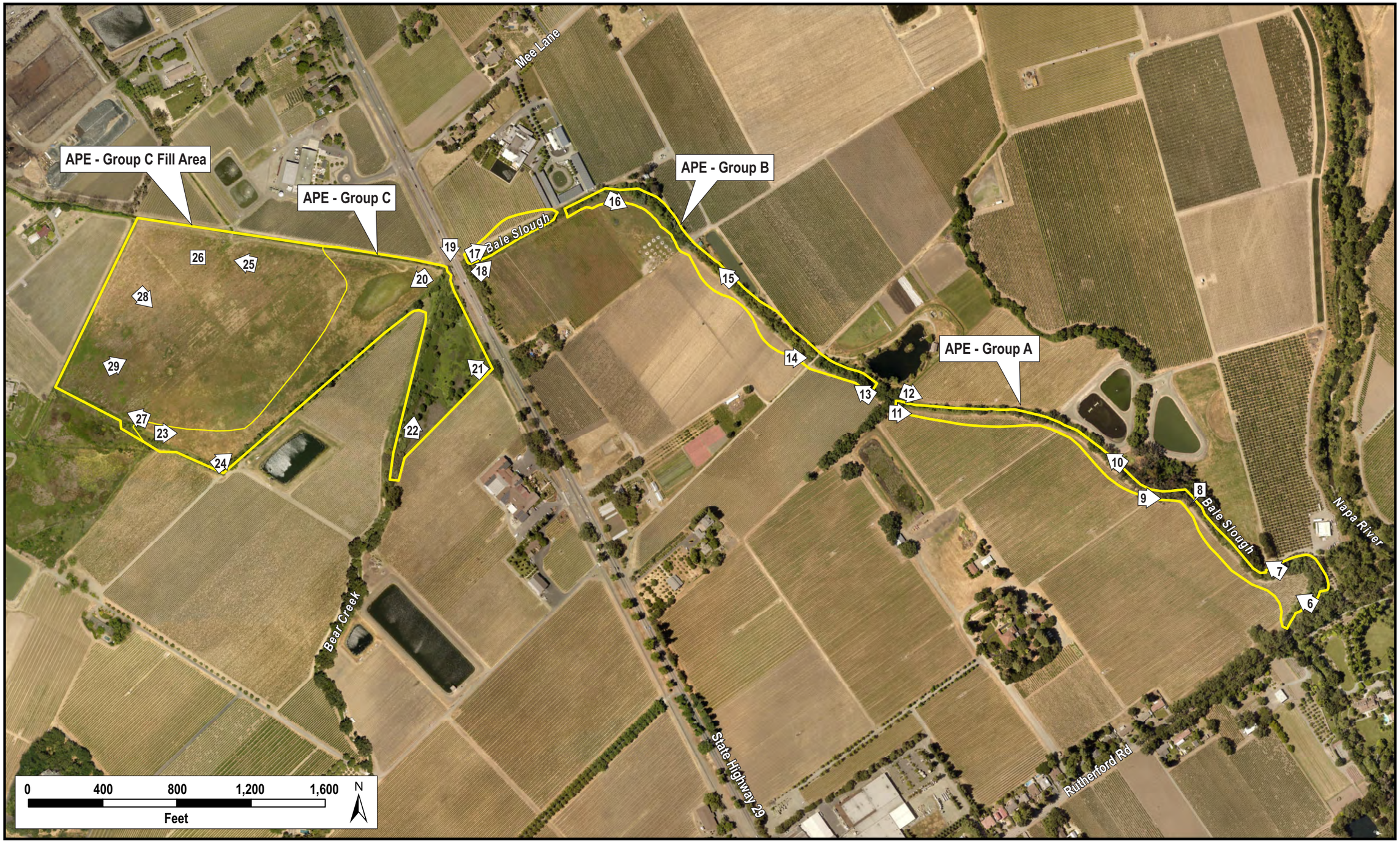


Figure 5: Area of Potential Effects with Field Survey Photo View Locations



Figure 6: Group A – view northwest on the south side of Bale Slough



Figure 7: Group A – view northwest along the north side of Bale Slough



Figure 8: Group A – prehistoric cultural material found on the south side of Bale Slough, within the APE, in the vicinity of P-28-000136



Figure 9: Group A – view east on the south side of Bale Slough, in the vicinity of P-28-000136



Figure 10: Group A – view northwest within Bale Slough



Figure 11: Group A – view east from north end along the south side of Bale Slough



Figure 12: Group A – view southeast from north end along the north side of Bale Slough



Figure 13: Group B – view northwest from the east end along the south side of Bale Slough



Figure 14: Group B – vehicle bridge across Bale Slough constructed from railroad car, view east



Figure 15: Group B – view northwest along the north side of Bale Slough



Figure 16: Group B – view southeast along the south side of Bale Slough



Figure 17: Group B – view east along the north side of Bale Slough from just east of Hwy 29



Figure 18: Group B – view east along the south side of Bale Slough from just east of Hwy 29



Figure 19: Group C – Napa Valley Wine train trestle over Bale Slough, view south



Figure 20: Group C – view southwest across Site 13 east of Bale Slough from near Hwy 29



Figure 21: Group C – view northwest across Site 12 towards Bear Creek from near Hwy 29



Figure 22: Group C – view north along the east side of Bear Creek in Site 12



Figure 23: Group C – view east across Site 14 from the south end



Figure 24: Group C – view northeast toward P-28-000475/NAP-593

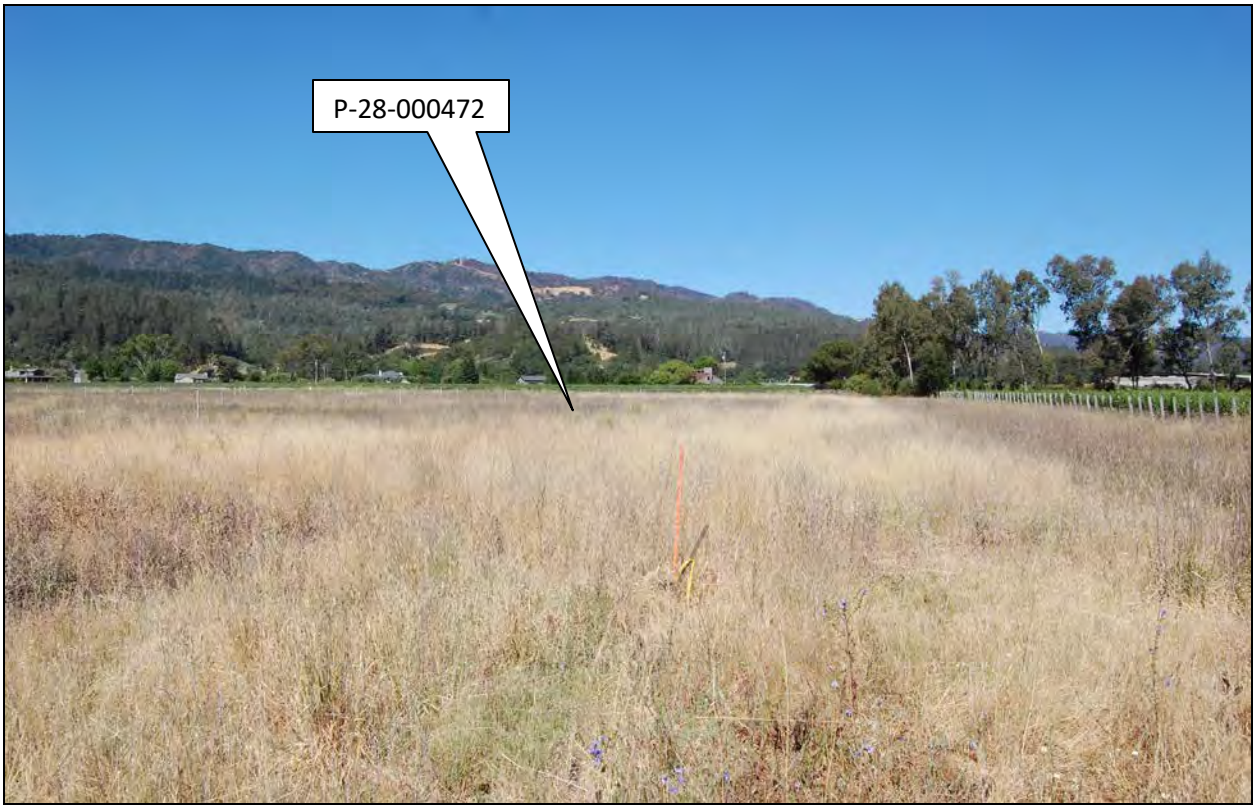


Figure 25: Group C Fill Area – view west toward general vicinity of P-28-000472/NAP-590



Figure 26: Group C Fill Area – visibility within P-28-000472/NAP-590



Figure 27: Group C Fill Area – view northwest toward location of P-28-000473/NAP-591



Figure 28: Group C Fill Area – view southeast across the fill area



Figure 29: Group C Fill Area – view northeast across the fill area



Figure 30: Group A – BTU 1, trench during excavation, view to southwest



Figure 31: Group A – BTU 1, south wall profile view



Figure 32: Group A – BTU 2, trench during excavation, view to southwest



Figure 33: Group A – BTU 2, west wall profile view



Figure 34: Group A – BTU 3, screened sediments



Figure 35: Group A – BTU 3, west wall profile view



Figure 36: Group A – BTU 4, trench during excavation with BTU 3 in foreground, view to north



Figure 37: Group A – BTU 4, west wall profile view



Figure 38: Group A – BTU 5, trench during excavation, view to northwest



Figure 39: Group A – BTU 5, west wall profile view



Figure 40: Group A – BTU 6, trench during excavation, view to west



Figure 41: Group A – BTU 6, west wall profile view



Figure 42: Group A – BTU 7, trench after excavation, view to southwest



Figure 43: Group A – BTU 7, west wall profile view



Figure 44: Group A – BTU 8, trench during excavation, view to northwest



Figure 45: Group A – BTU 8, west wall profile view



Figure 46: Group A – BTU 9, trench during excavation, view to northeast



Figure 47: Group A – BTU 9, west wall profile view



Figure 48: Group A – BTU 10, trench during excavation, view to northwest



Figure 49: Group A – BTU 10, west wall profile view



Figure 50: Group A – BTU 11, trench during excavation, view to northeast



Figure 51: Group A – BTU 11, west wall profile view

NATIVE AMERICAN OUTREACH

LETTER	Request to Native American Heritage Commission
LETTER	Native American Heritage Commission Response
LETTERS	Request to Native Americans Identified by Native American Heritage Commission
RESPONSE	Responses from Native American Outreach

Sacred Lands File & Native American Contacts List Request

NATIVE AMERICAN HERITAGE COMMISSION

1556 Harbor Boulevard, STE 100
West Sacramento, CA 95691
(916) 373-3710
(916) 373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: Bale Slough Flood Control and Wetlands Expansion

County: Napa

USGS Quadrangle Name: USGS Rutherford, Calif. 1973

Address: No address - Bale Slough – north and east of Rutherford. Bale Slough starts roughly 0.3 miles west of its intersection with State Highway 29 and extends east along the slough to its termination with Rutherford Road east of the Town of Rutherford.

Township: 7 North, **Range**: 5 West, unsectioned

Company/Firm/Agency: Basin Research Associates

Contact Person: Colin I. Busby, PhD, RPA

Street Address: 1933 Davis Street, STE 210

City/Zip: San Leandro, CA 94577

Phone: (510) 430-8441 x101

Email: Please send response to basinres1@gmail.com

Project Description:

Flood control improvements along Bale Slough to mitigate weather related flooding of agricultural land (vineyards) – wetlands restoration area west of State Highway 29 to be constructed to hold excess runoff.

Project is continuation of Napa River Flood Control Project efforts.

Date: 07/16/2020

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

SECRETARY
Merri Lopez-Keifer
Luiseño

PARLIAMENTARIAN
Russell Attebery
Karuk

COMMISSIONER
Marshall McKay
Wintun

COMMISSIONER
William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Julie Tumamait-Stenslie
Chumash

COMMISSIONER
[**Vacant**]

COMMISSIONER
[**Vacant**]

EXECUTIVE SECRETARY
Christina Snider
Pomo

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

July 21, 2020

Colin I. Busby, PhD, RPA
Basin Research Associates

Via Email to: basinres1@gmail.com
Cc to: scottg@mishewalwappoindians.com

Re: Bale Slough Flood Control and Wetlands Expansion Project, Napa County

Dear Dr. Busby:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were positive. Please contact the Mishewal-Wappo Tribe of Alexander Valley on the attached list for more information. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Sarah.Fonseca@nahc.ca.gov.

Sincerely,

Sarah Fonseca
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Napa County
7/21/2020

Cortina Rancheria - Kletsel Dehe Band of Wintun Indians
Charlie Wright, Chairperson
P.O. Box 1630 — Wintun
Williams, CA, 95987
Phone: (530) 473 - 3274
Fax: (530) 473-3301

Guidiville Indian Rancheria
Merlene Sanchez, Chairperson
P.O. Box 339 — Pomo
Talmage, CA, 95481
Phone: (707) 462 - 3682
Fax: (707) 462-9183
admin@guidiville.net

Middletown Rancheria
Sally Peterson, THPO
P.O. Box 1658 — Lake Miwok
Middletown, CA, 95461 — Pomo
Phone: (707) 987 - 3670
THPO@middletownrancheria.com

Middletown Rancheria of Pomo Indians
Jose Simon, Chairperson
P.O. Box 1035 — Lake Miwok
Middletown, CA, 95461 — Pomo
Phone: (707) 987 - 3670
Fax: (707) 987-9091
sshope@middletownrancheria.com

Mishewal-Wappo Tribe of Alexander Valley
Scott Gabaldon, Chairperson
2275 Silk Road — Wappo
Windsor, CA, 95492
Phone: (707) 494 - 9159
scottg@mishewalwappotribe.com

Yocha Dehe Wintun Nation
Anthony Roberts, Chairperson
P.O. Box 18 — Patwin
Brooks, CA, 95606
Phone: (530) 796 - 3400
Fax: (530) 796-2143
aroberts@yochadehe-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Bale Slough Flood Control and Wetlands Expansion Project, Napa County.

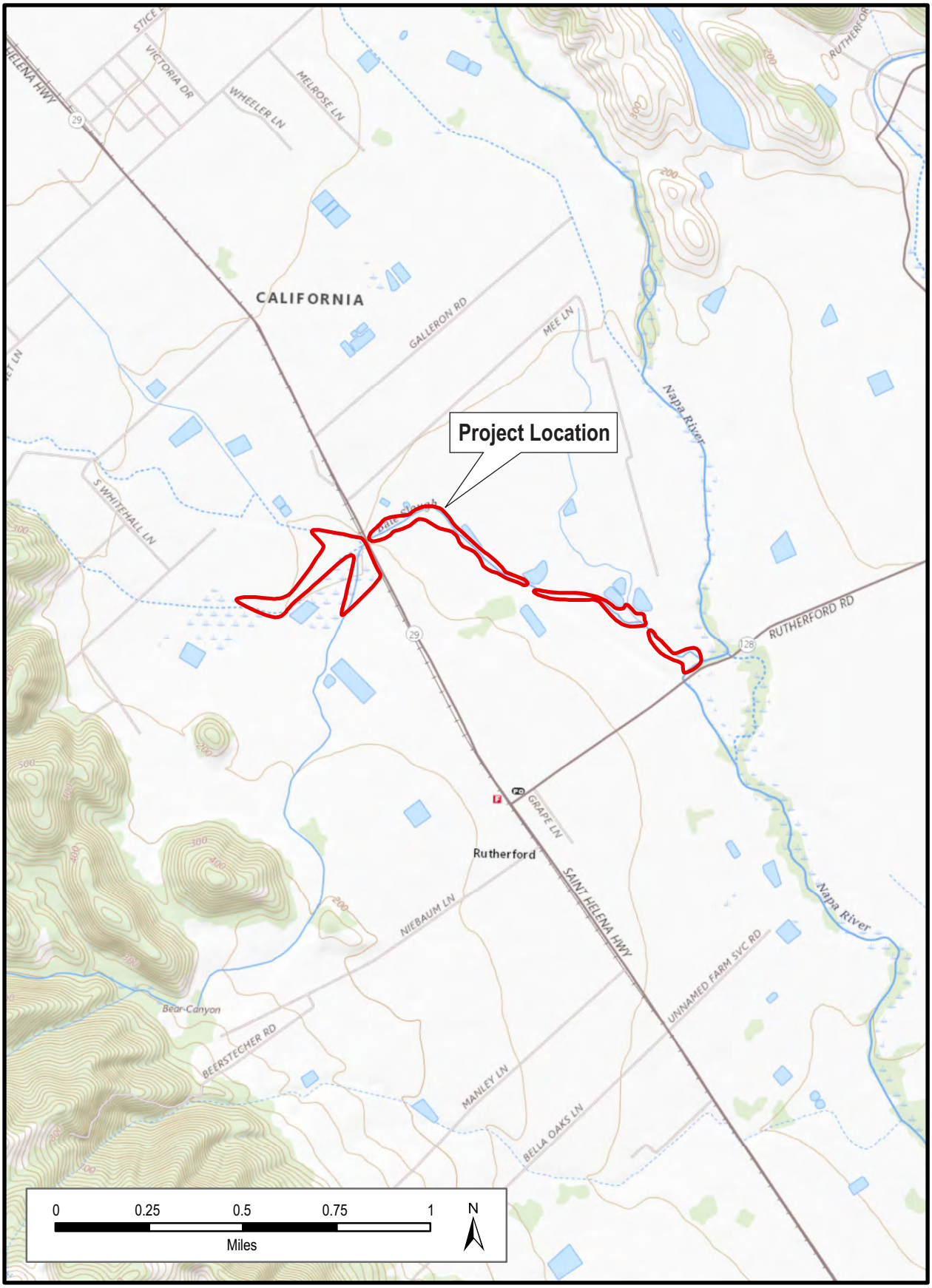


Figure 1: Project Location - T7N R5W unsectioned (USGS National Map)



Figure 1: Project Location - T7N R5W unsectioned (USGS Rutherford, Calif. 1973)



July 24, 2020

BASIN
RESEARCH
ASSOCIATES
1933 DAVIS STREET
SUITE 215
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Cortina Rancheria – Kletsel Dehe Band of Wintun Indians
Charlie Wright, Chairperson
P.O. Box 1630
Williams, CA 95987

RE: Request for Information – Napa Flood Control Project
Bale Slough Flood Control and Wetlands Expansion, Near Rutherford, Napa County

Dear Chairperson Wright,

The Native American Heritage Commission has provided your name as a person who may have further information on Native American resources for a proposed flood control and wetlands expansion near Rutherford, Napa County. The NAHC review of the Sacred Lands File (SLF) indicated that the Mishewal-Wappo Tribe of Alexander Valley is aware of resources within the project area and we have contacted the Tribe for information.

The flood control improvements along Bale Slough are to mitigate weather related flooding of agricultural land (vineyards) with the construction of an associated wetlands restoration area west of State Highway 29 to hold excess runoff. Bale Slough is north and east of Rutherford with the project starting roughly 0.3 miles west of its intersection with State Highway 29 and extending east along the slough to its termination with Rutherford Road east of the Town of Rutherford. The majority of the project area has been impacted by agriculture and other flood control projects.

Any information that you can provide will be used to assist Napa Flood Control to meet the requirements of both the California Environmental Quality Act (CEQA) and to assist Napa Flood Control obtain a U.S. Army Corps of Engineers 404 Permit.

We look forward to hearing from you. I can be reached at (510) 430-8441 x101 or via email at basinres1@gmail.com. Mr. Jeremy Sarrow (County of Napa Jeremy.Sarrow@countyofnapa.org) can be contacted for additional information. Thanking you in advance for any assistance.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA



July 24, 2020

BASIN
RESEARCH
ASSOCIATES
1933 DAVIS STREET
SUITE 215
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Guidiville Indian Rancheria
Merlene Sanchez, Chairperson
P.O. Box 339
Talmage, CA 95481

RE: Request for Information – Napa Flood Control Project
Bale Slough Flood Control and Wetlands Expansion, Near Rutherford, Napa County

Dear Chairperson Sanchez,

The Native American Heritage Commission has provided your name as a person who may have further information on Native American resources for a proposed flood control and wetlands expansion near Rutherford, Napa County. The NAHC review of the Sacred Lands File (SLF) indicated that the Mishewal-Wappo Tribe of Alexander Valley is aware of resources within the project area and we have contacted the Tribe for information.

The flood control improvements along Bale Slough are to mitigate weather related flooding of agricultural land (vineyards) with the construction of an associated wetlands restoration area west of State Highway 29 to hold excess runoff. Bale Slough is north and east of Rutherford with the project starting roughly 0.3 miles west of its intersection with State Highway 29 and extending east along the slough to its termination with Rutherford Road east of the Town of Rutherford. The majority of the project area has been impacted by agriculture and other flood control projects.

Any information that you can provide will be used to assist Napa Flood Control to meet the requirements of both the California Environmental Quality Act (CEQA) and to assist Napa Flood Control obtain a U.S. Army Corps of Engineers 404 Permit.

We look forward to hearing from you. I can be reached at (510) 430-8441 x101 or via email at basinres1@gmail.com. Mr. Jeremy Sarrow (County of Napa Jeremy.Sarrow@countyofnapa.org) can be contacted for additional information. Thanking you in advance for any assistance.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA



July 24, 2020

BASIN
RESEARCH
ASSOCIATES
1933 DAVIS STREET
SUITE 215
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Middletown Rancheria
Sally Peterson, THPO
P.O. Box 1658
Middletown, CA 95461

RE: Request for Information – Napa Flood Control Project
Bale Slough Flood Control and Wetlands Expansion, Near Rutherford, Napa County

Dear Ms. Peterson,

The Native American Heritage Commission has provided your name as a person who may have further information on Native American resources for a proposed flood control and wetlands expansion near Rutherford, Napa County. The NAHC review of the Sacred Lands File (SLF) indicated that the Mishewal-Wappo Tribe of Alexander Valley is aware of resources within the project area and we have contacted the Tribe for information.

The flood control improvements along Bale Slough are to mitigate weather related flooding of agricultural land (vineyards) with the construction of an associated wetlands restoration area west of State Highway 29 to hold excess runoff. Bale Slough is north and east of Rutherford with the project starting roughly 0.3 miles west of its intersection with State Highway 29 and extending east along the slough to its termination with Rutherford Road east of the Town of Rutherford. The majority of the project area has been impacted by agriculture and other flood control projects.

Any information that you can provide will be used to assist Napa Flood Control to meet the requirements of both the California Environmental Quality Act (CEQA) and to assist Napa Flood Control obtain a U.S. Army Corps of Engineers 404 Permit.

We look forward to hearing from you. I can be reached at (510) 430-8441 x101 or via email at basinres1@gmail.com. Mr. Jeremy Sarrow (County of Napa Jeremy.Sarrow@countyofnapa.org) can be contacted for additional information. Thanking you in advance for any assistance.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA



July 24, 2020

BASIN
RESEARCH
ASSOCIATES
1933 DAVIS STREET
SUITE 215
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Middletown Rancheria of Pomo Indians
Jose Simon, Chairperson
P.O. Box 1035
Middletown, CA 95461

RE: Request for Information – Napa Flood Control Project
Bale Slough Flood Control and Wetlands Expansion, Near Rutherford, Napa County

Dear Chairperson Simon,

The Native American Heritage Commission has provided your name as a person who may have further information on Native American resources for a proposed flood control and wetlands expansion near Rutherford, Napa County. The NAHC review of the Sacred Lands File (SLF) indicated that the Mishewal-Wappo Tribe of Alexander Valley is aware of resources within the project area and we have contacted the Tribe for information.

The flood control improvements along Bale Slough are to mitigate weather related flooding of agricultural land (vineyards) with the construction of an associated wetlands restoration area west of State Highway 29 to hold excess runoff. Bale Slough is north and east of Rutherford with the project starting roughly 0.3 miles west of its intersection with State Highway 29 and extending east along the slough to its termination with Rutherford Road east of the Town of Rutherford. The majority of the project area has been impacted by agriculture and other flood control projects.

Any information that you can provide will be used to assist Napa Flood Control to meet the requirements of both the California Environmental Quality Act (CEQA) and to assist Napa Flood Control obtain a U.S. Army Corps of Engineers 404 Permit.

We look forward to hearing from you. I can be reached at (510) 430-8441 x101 or via email at basinres1@gmail.com. Mr. Jeremy Sarrow (County of Napa Jeremy.Sarrow@countyofnapa.org) can be contacted for additional information. Thanking you in advance for any assistance.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA



July 24, 2020

BASIN
RESEARCH
ASSOCIATES
1933 DAVIS STREET
SUITE 215
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Mishewal-Wappo Tribe Alexander Valley
Scott Gabaldon, Chairperson
2275 Silk Road
Windsor, CA 95492

RE: Request for Information – Napa Flood Control Project
Bale Slough Flood Control and Wetlands Expansion, Near Rutherford, Napa County

Dear Chairperson Gabaldon,

The Native American Heritage Commission has provided your name as a person who may have further information on Native American resources for a proposed flood control and wetlands expansion near Rutherford, Napa County. The NAHC review of the Sacred Lands File (SLF) indicated that the Mishewal-Wappo Tribe of Alexander Valley is aware of resources within the project area.

The flood control improvements along Bale Slough are to mitigate weather related flooding of agricultural land (vineyards) with the construction of an associated wetlands restoration area west of State Highway 29 to hold excess runoff. Bale Slough is north and east of Rutherford with the project starting roughly 0.3 miles west of its intersection with State Highway 29 and extending east along the slough to its termination with Rutherford Road east of the Town of Rutherford. The majority of the project area has been impacted by agriculture and other flood control projects.

Any information that you can provide will be used to assist Napa Flood Control to meet the requirements of both the California Environmental Quality Act (CEQA) and to assist Napa Flood Control obtain a U.S. Army Corps of Engineers 404 Permit.

We look forward to hearing from you. I can be reached at (510) 430-8441 x101 or via email at basinres1@gmail.com. Mr. Jeremy Sarrow (County of Napa Jeremy.Sarrow@countyofnapa.org) can be contacted for additional information. Thanking you in advance for any assistance.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA



July 24, 2020

BASIN
RESEARCH
ASSOCIATES
1933 DAVIS STREET
SUITE 215
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Yocha Dehe Wintun Nation
Anthony Roberts, Chairperson
P.O. Box 18
Brooks, CA 95606

RE: Request for Information – Napa Flood Control Project
Bale Slough Flood Control and Wetlands Expansion, Near Rutherford, Napa County

Dear Chairperson Roberts,

The Native American Heritage Commission has provided your name as a person who may have further information on Native American resources for a proposed flood control and wetlands expansion near Rutherford, Napa County. The NAHC review of the Sacred Lands File (SLF) indicated that the Mishewal-Wappo Tribe of Alexander Valley is aware of resources within the project area and we have contacted the Tribe for information.

The flood control improvements along Bale Slough are to mitigate weather related flooding of agricultural land (vineyards) with the construction of an associated wetlands restoration area west of State Highway 29 to hold excess runoff. Bale Slough is north and east of Rutherford with the project starting roughly 0.3 miles west of its intersection with State Highway 29 and extending east along the slough to its termination with Rutherford Road east of the Town of Rutherford. The majority of the project area has been impacted by agriculture and other flood control projects.

Any information that you can provide will be used to assist Napa Flood Control to meet the requirements of both the California Environmental Quality Act (CEQA) and to assist Napa Flood Control obtain a U.S. Army Corps of Engineers 404 Permit.

We look forward to hearing from you. I can be reached at (510) 430-8441 x101 or via email at basinres1@gmail.com. Mr. Jeremy Sarrow (County of Napa Jeremy.Sarrow@countyofnapa.org) can be contacted for additional information. Thanking you in advance for any assistance.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA

Record of Native American Contacts
Proposed Tesla Road Guardrail Project, Alameda County.

7/16/2020 Letter to the Native American Heritage Commission (NAHC), Sacramento. Regarding: Request for Review of Sacred Lands Inventory for project.

7/21/2020 Letter response by Sarah Fonseca, NAHC

7/21/2020 Letters sent to all parties recommended by NAHC

Charlie Wright, Chairperson, *Kletsel Dehe Band of Wintun Indians*; a Federally tribe previously listed as the *Cortina Indian Rancheria* and the *Cortina Indian Rancheria of Wintun Indians of California;*

Merelene Sanchez, Chairperson, *Guidiville Indian Rancheria;* a Federal tribe;

Jose Simon III, Chairperson, *Middletown Rancheria of Pomo Indians of California*, a Federally recognized tribe;

Sally Peterson, THPO, *Middletown Rancheria of Pomo Indians of California*, a Federally recognized tribe;

Scott Gabaldon, Chairperson, *Mishewal-Wappo Tribe of Alexander Valley;*

Anthony Roberts, Chairperson, *Yocha Dehe Wintun Nation*, a Federally tribe previously listed as the *Rumsey Indian Rancheria of Wintun Indians of California*.

8/26/20 Telephone call made by Basin Research Associates (Colin I . Busby) at 2:40 PM to Chairperson Scott Gabaldon. Message left regarding SLF resources noted in NAHC letter and requesting comment.

CHRIS/NWIC SEARCH

SEARCH CHRIS/NWIC File No. 20-0072 (Dated August 14, 2020) [No Confidential Information]

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

ALAMEDA, COLUSA, CONTRA COSTA, DEL NORTE, HUMBOLDT, LAKE, MARIN, MENDOCINO, MONTEREY, NAPA, SAN BENITO, SAN FRANCISCO, SAN MATEO, SANTA CLATA, SANTA CRUZ, SOLANO, SONOMA, YOLO

Northwest Information Center
Sonoma State University
150 Professional Center Drive, Suite E
Rohnert Park, California 94928-3609
Tel: 707.588.8455
nwic@sonoma.edu
http://www.sonoma.edu/nwic

8/14/2020 NWIC File No.: 20-0072

Donna M. Garaventa
Basin Research Associates
1933 Davis Street, Suite 210
San Leandro, CA 94577

Re: Bale Slough Napa

The Northwest Information Center received your record search request for the project area referenced above, located on the Rutherford USGS 7.5' quad(s). The following reflects the results of the records search for the project area and a ¼ mi. radius:

Resources within project area:	P-28-000470, P-28-000474, P-28-000475, P-28-000966, P-28-001547
Resources within ¼ mi. radius:	P-28-000136, P-28-000137, P-28-000147, P-28-000285, P-28-000469, P-28-000471, P-28-000472, P-28-000473, P-28-000585, P-28-000828, P-28-000999
Reports within project area:	S-2483, 2505, 2574, 7618, 11723, 16881, 21260, 33511, 34467, 36250
Reports within ¼ mi. radius:	S-1631, 2392, 4917, 9424, 12739, 14658, 31236, 34210, 43827, 51177

Resource Database Printout (list): ☒ enclosed ☐ not requested ☐ nothing listed

Resource Database Printout (details): ☒ enclosed ☐ not requested ☐ nothing listed

Resource Digital Database Records: ☐ enclosed ☒ not requested ☐ nothing listed

Report Database Printout (list): ☒ enclosed ☐ not requested ☐ nothing listed

Report Database Printout (details): ☒ enclosed ☐ not requested ☐ nothing listed

Report Digital Database Records: ☐ enclosed ☒ not requested ☐ nothing listed

Resource Record Copies: ** ☐ enclosed ☐ not requested ☐ nothing listed

Report Copies: ** ☐ enclosed ☐ not requested ☐ nothing listed

OHP Built Environment Resources Directory: ☒ enclosed ☐ not requested ☐ nothing listed

Archaeological Determinations of Eligibility: ☒ enclosed ☐ not requested ☐ nothing listed

CA Inventory of Historic Resources (1976): ☐ enclosed ☒ not requested ☐ nothing listed

*Notes:

** Invoice will be held open to request PDFs of Reports and/or Resources for one week, until

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System (CHRIS).

Sincerely,

Annette Neal

Researcher

SITE FORM UPDATES (DPR 523)

FORM 1	P-28-000136 (CA-NAP-144
FORM 2	P-28-000472 (CA-NAP-590)
FORM 3	P-28-000473 (CA-NAP-591)
FORM 4	P-28-000474 (CA-NAP-592)
FORM 5	P-28-000475 (CA-NAP-593)

The site was relocated during BASIN's field inventory (7/22/2020) based on a surface inspection. The resource appears to be adjacent to but north of the CHRIS/NWIC mapped location. A low density obsidian scatter with flakes ranging from 1-2 mm to 40+ mm was present along the access road and within a portion of the adjacent vineyard outside of the APE. Observed prehistoric cultural material consisted of a number of obsidian flakes (various reduction stages), several biface fragments including a possible projectile point fragment, groundstone fragments, a pestle fragment, and very small quantities of fire affected rock. The sediment was a grayish brown (10YR 5/2) loam. Site density ranged from an average of 15 flakes per square meter to 3 flakes per square meter. Trowel excavation noted lithic material 6-inches below the surface. The observations are similar to the initial description in 1951.

Obsidian projectile point (incomplete, Stage 4/5) 40 mm long x 20 mm wide x 4 mm thick

Obsidian biface (incomplete, Stage 3) 50 mm long x 16 mm wide x 5 mm thick

Obsidian medial biface (incomplete, Stage 3) 20 mm long x 17 mm wide x 2 mm thick

Granite pestle (incomplete) 5 cm long x 5 1/2 cm wide x 5 cm thick, smooth and polished along the shaft, with breaks at both ends

Fine grained volcanic rock (basalt ?), formed flake tool, domed scraper

Inspection of the location of the few artifact finds in relation to the vineyard rows suggested that soil displacement and dispersal during plowing (or ripping) has impacted the resource. The lithics appeared to be concentrated at plow or equipment turn points with further dispersal probably occurring during travel along the vineyard rows and unimproved access road. Overbank flooding of Bale Slough during episodic flooding may have also contributed to dispersal.

Presence/Absence Testing – backhoe testing by BASIN in December 2020 exposed no cultural materials to the immediate northeast (BTU 7) and east (BTU 6) suggesting a limited surface extent for the resource. The site, as interpreted by BASIN, suggests a small, very low density and shallow lithic scatter dispersed by both natural and agricultural impacts with surface visibility dependent on exposure during agricultural activities. The resource has been severely impacted both horizontally and vertically by agricultural plowing and use for at least 70 years. The site was probably a small temporary campsite or use area – typical of occupation along water courses in the Napa Valley.

Evaluation – CA-NAP-144 does not appear eligible for the NRHP or the CRHR as it does not satisfy criterion (d)/(4) ". . . have yielded, or may be likely to yield, information important in prehistory or history" and the resource does not meet the overall requirements of integrity of location, materials, design and association. *Integrity* is the ability of the archaeological property to convey significance through physical features and context.

The resource does have integrity of *location* as the site was able to be relocated although not within its original mapped location. The probable intermittent and seasonal use of the site for an unknown length of time did not result in the formation of any discernible cultural deposits that appear to have survived the impacts from vineyard levelling and cultivation.

The site has minimal cultural *materials* present that have been impacted by soil displacement and dispersal during plowing (or ripping) No culturally affected sediment is present. The paucity of cultural materials and their dispersion over the site provides no or very limited data sets to answer potential research questions on site chronology and possible use.

The development and interpretation of relationships and/or patterning is not possible due to the dispersion of the minimal artifacts by previous and ongoing agricultural operations and the existing access road. No identifiable cultural features are present (*design*).

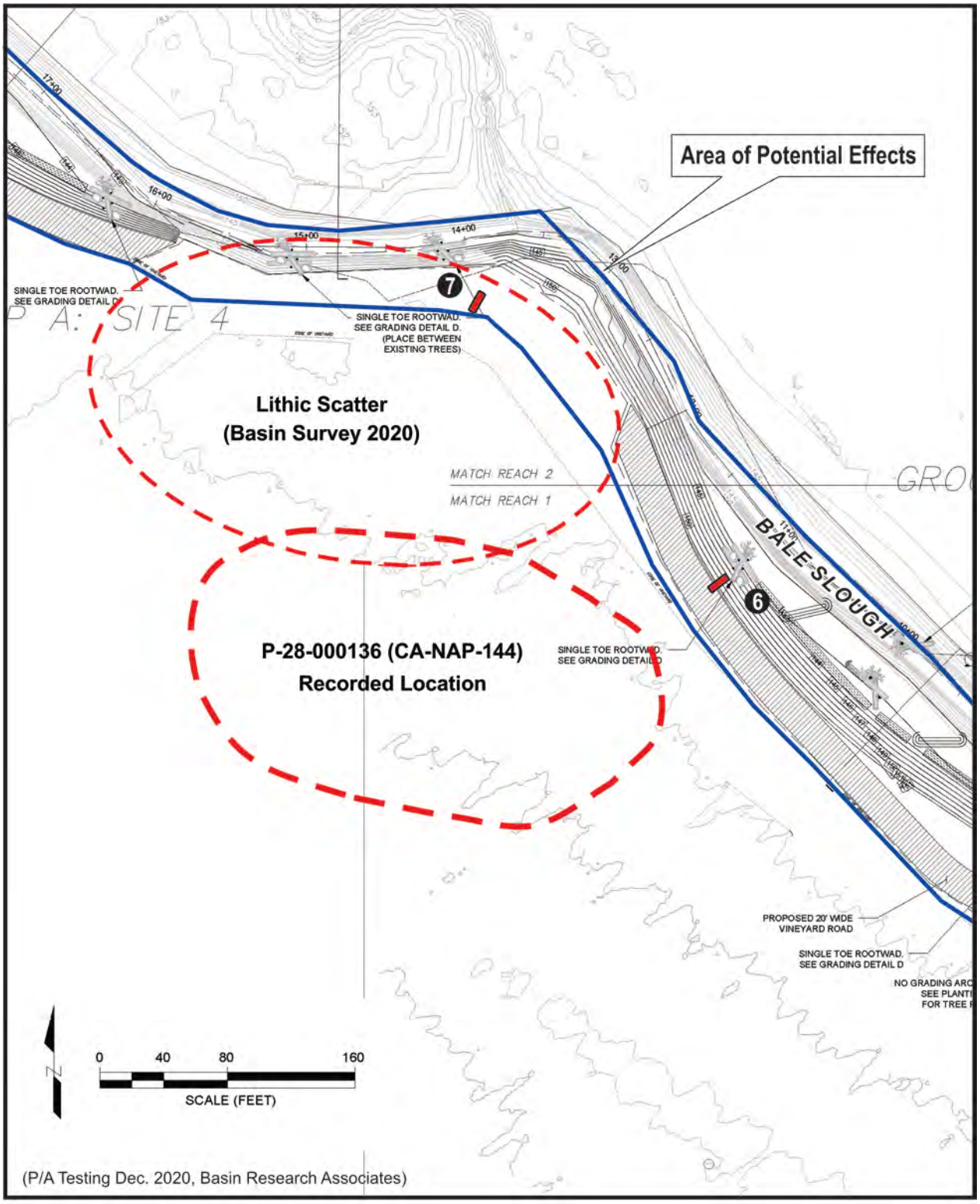
The site lacks *association*. The available information provides no or very minimal data sets to answer research questions on site chronology, location and possible use.



View to east – location of lithic scatter just to the north of P-28-000136/CA-NAP-144



BTU 6 – P-28-000136/CA-NAP-144 recorded location is to the left in the vineyard, view to northwest



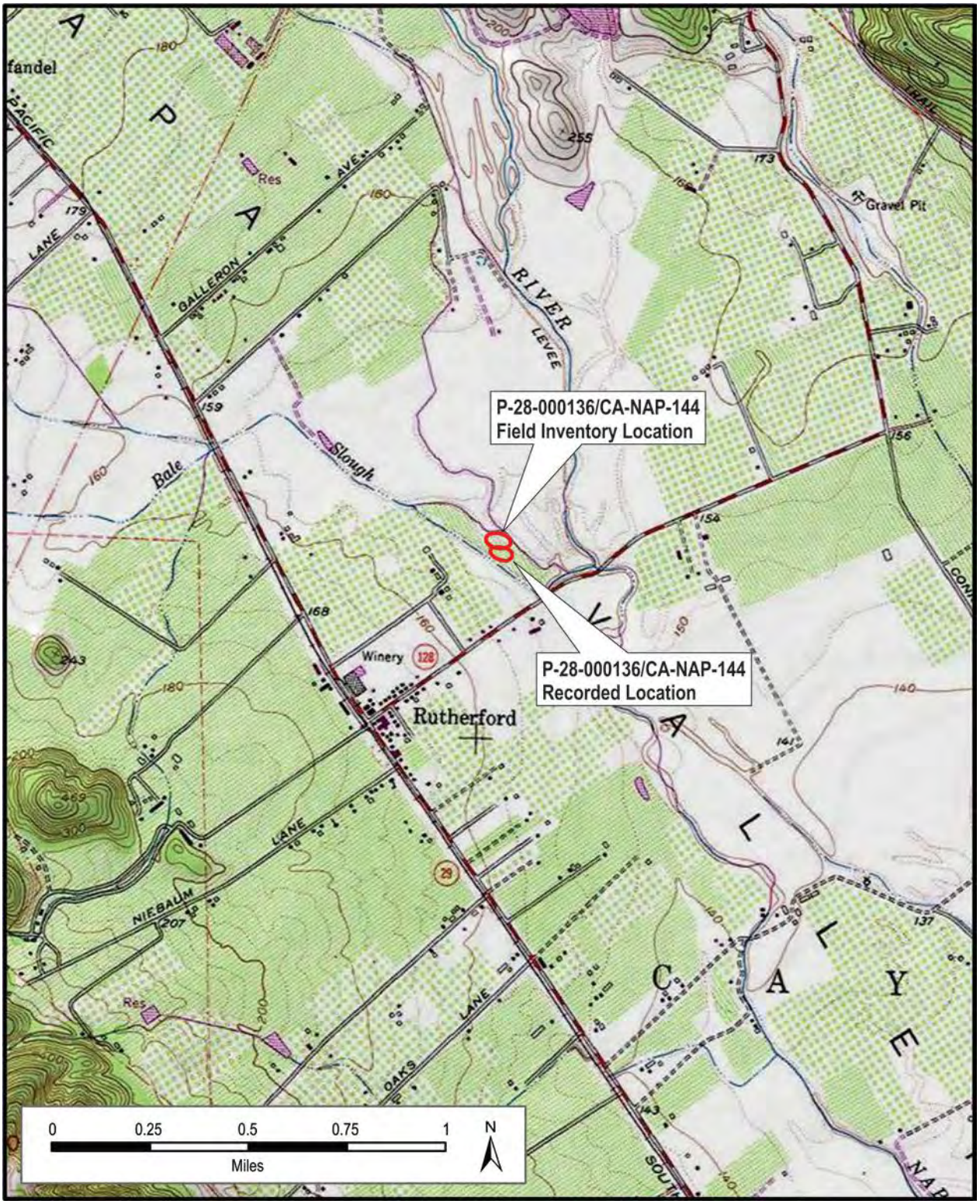
Backhoe Testing Units in the Vicinity of P-28-000136/CA-NAP-144

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # P-28-000136
HRI #
Trinomial CA-NAP-144

Page 4 of 4 Resource Name or #:
Map Name Rutherford (1:24000) Map Date: 1973 ☐ Continuation ☒ Update



No indications of the site were noted on the surface during the BASIN field inventory in 2021 (6/15/2021). The site location is currently overgrown with seasonal vegetation but appears to have been within an active vineyard from at least 2002 (and probably earlier) until 2015/2016 when the vines were removed (Google Earth Image Date 4/26/2015). An area of hard compact dark grayish brown clayey soil was present within the recorded site location which differs slightly in color from the surrounding grayish-brown soil. However, the elevated 1.5 meter "mound" noted in 1981 is no longer present due to agricultural leveling. No surface evidence of any of the cultural material types noted in 1981 are present either within or adjacent to the recorded site location. It appears that the resource has been removed or dispersed by vineyard cultivation over the past 35 years.

Evaluation **-** CA-NAP-590 does not appear eligible for the NRHP or the CRHR as it does not satisfy criterion (d)/(4) ". . . have yielded, or may be likely to yield, information important in prehistory or history" and the resource does not meet the overall requirements of integrity of location, materials, design and association. *Integrity* is the ability of the archaeological property to convey significance through physical features and context.

The resource does not have integrity of *location* as the site was not able to be relocated. The probable intermittent and seasonal use of the site for an unknown length of time did not result in the formation of any discernible cultural deposits that appear to have survived the impacts from vineyard levelling and cultivation.

The site has no cultural *materials* present including any culturally affected sediment. The paucity of cultural materials and their dispersion over the site provides no or very limited data sets to answer potential research questions on site chronology and possible use.

The development and interpretation of relationships and/or patterning is not possible due to the lack of cultural materials (*design*).

The site lacks *association*. The available information provides no or very minimal data sets to answer research questions on site chronology, location and possible use.



View to west towards P-28-000472/CA-NAP-590



Typical visibility within P-28-000472/CA-NAP-590

No indications of the site were noted on the surface during the BASIN field inventory in 2021 (6/15/2021). The site location is currently overgrown with seasonal vegetation but appears to have been an active vineyard from at least 2002 (and probably earlier) until 2015/2016 when the vines were removed (Google Earth Image Date 4/26/2015). No surface evidence of any of the cultural material types noted in 1981 are present either within or adjacent to the recorded site location. It appears that the resource has been removed by vineyard cultivation over the past 35 years.

Evaluation **-** CA-NAP-591 does not appear eligible for the NRHP or the CRHR as it does not satisfy criterion (d)/(4) ". . . have yielded, or may be likely to yield, information important in prehistory or history" and the resource does not meet the overall requirements of integrity of location, materials, design and association. *Integrity* is the ability of the archaeological property to convey significance through physical features and context.

The resource does not have integrity of *location* as the site was not able to be relocated. The probable intermittent and seasonal use of the site for an unknown length of time did not result in the formation of any discernible cultural deposits that appear to have survived the impacts from vineyard levelling and cultivation.

The site has no cultural *materials* present including any culturally affected sediment. The paucity of cultural materials and their dispersion over the site provides no or very limited data sets to answer potential research questions on site chronology and possible use.

The development and interpretation of relationships and/or patterning is not possible due to the lack of cultural materials (*design*).

The site lacks *association*. The available information provides no or very minimal data sets to answer research questions on site chronology, location and possible use.



View northwest – P-28-000473/NAP-591

No indications of the site were noted on the surface during the BASIN field inventory in 2021 (6/15/2021). The site location is currently overgrown with seasonal vegetation but appears to have been within an active vineyard from at least 2002 (and probably earlier) until 2006 when the vines were removed (Image Date 5/16/2006). An area of hard compact dark grayish brown clayey soil was present within the recorded site boundaries. This soil differed from the surrounding grayish-brown soil. No surface evidence of any of the cultural material types noted in 1981 are present either within or adjacent to the recorded site location. It appears that the resource has been removed by vineyard cultivation over the past 35 years.

Evaluation – CA-NAP-592 does not appear eligible for the NRHP or the CRHR as it does not satisfy criterion (d)/(4) ". . . have yielded, or may be likely to yield, information important in prehistory or history" and the resource does not meet the overall requirements of integrity of location, materials, design and association. *Integrity* is the ability of the archaeological property to convey significance through physical features and context.

The resource does not have integrity of *location* as the site was not able to be relocated. The probable intermittent and seasonal use of the site for an unknown length of time did not result in the formation of any discernible cultural deposits that appear to have survived the impacts from vineyard levelling and cultivation.

The site has no cultural *materials* present including any culturally affected sediment. The paucity of cultural materials and their dispersion over the site provides no or very limited data sets to answer potential research questions on site chronology and possible use.

The development and interpretation of relationships and/or patterning is not possible due to the lack of cultural materials (*design*).

The site lacks *association*. The available information provides no or very minimal data sets to answer research questions on site chronology, location and possible use.



View southwest – P-28-000474/NAP-592

BASIN's field review in 2020 (6/15/2021) did not relocate the site which is within and adjacent to the project APE and immediately adjacent to an excavated drainage basin. The site location is currently overgrown with seasonal vegetation. It is possible that site is cultural material from agricultural ditch excavation/maintenance, vineyard cultivation, or a very light density surface scatter. Possible midden development was noted apparently based on a "grey" soil color. However, it is probable that this could represent an organic water-affected sediment excavated from a ditch as the general area was noted as disturbed by ditch construction and channelization and vineyard cultivation.

Evaluation – CA-NAP-593 does not appear eligible for the NRHP or the CRHR as it does not satisfy criterion (d)/(4) ". . . have yielded, or may be likely to yield, information important in prehistory or history" and the resource does not meet the overall requirements of integrity of location, materials, design and association. *Integrity* is the ability of the archaeological property to convey significance through physical features and context.

The resource does not have integrity of *location* as the site was not able to be relocated. The probable intermittent and seasonal use of the site for an unknown length of time did not result in the formation of any discernible cultural deposits that appear to have survived the impacts from vineyard levelling and cultivation.

The site has no cultural *materials* present including any culturally affected sediment. The paucity of cultural materials and their dispersion over the site provides no or very limited data sets to answer potential research questions on site chronology and possible use.

The development and interpretation of relationships and/or patterning is not possible due to the lack of cultural materials (*design*).

The site lacks *association*. The available information provides no or very minimal data sets to answer research questions on site chronology, location and possible use.



View northeast – P-28-000475/NAP-593

Appendix E

Geotechnical Report

Bear Creek/Bale Slough Replacement Bridge

Geotechnical Investigation Report

Prepared for:

Napa County Department of Public Works
804 First Street
Napa, CA 94559

Submitted by:

Questa Engineering Corporation
1220 Brickyard Cove Road, Suite 206
Point Richmond, California 94801
(510) 236-6114

December 2020

Bear Creek/Bale Slough

Geotechnical Investigation Report

Prepared for:

Napa County Department of Public Works
804 First Street
Napa, CA 94559

Submitted by:

Questa Engineering Corporation
1220 Brickyard Cove Road, Suite 206
P. O. Box 70356
Point Richmond, California 94807
(510) 236-6114

Questa Project Number 1900133

Sydney Temple, PE # 59695
Principal/Senior Engineer

Willard N. Hopkins, CEG #1761, exp. 7/31/21
Supervising Engineering Geologist

December 2020

TABLE OF CONTENTS

INTRODUCTION **1**
FIELD INVESTIGATION **1**
Subsurface Drilling Investigation 1
LABORATORY TESTING **2**
Moisture/Density 2
Particle Size Analysis 2
Liquid Limit, Plastic Limit and Plasticity Index 2
Strength Testing 2
Corrosion Testing 3
REGIONAL SEISMICITY **4**
FAULTING **4**
SITE GEOLOGY **6**
LIQUEFACTION **7**
Liquefaction Analysis 7
GEOTECHNICAL RECOMMENDATIONS **7**
Site Preparation and Grading 8
Roadway Subgrade 8
Aggregate Base (AB) 8
Hot Mix Asphalt (HMA) 8
Bridge Foundations 8
Retaining Wall Design Parameters 9
Drainage Measures 10
Seismic Design Response Spectrum 10
CONCLUSIONS **10**
LIMITATIONS **11**
BIBLIOGRAPHY **11**

FIGURES

Figure 1 Project Location
Figure 2 Log of Borehole B-1
Figure 3 Log of Borehole B-2
Figure 4 Unified Soil Classification System and Key to Abbreviations
Figure 5 Particle Size Analyses
Figure 6 Particle Size Analyses
Figure 7 Atterberg Limits Testing
Figure 8 Atterberg Limits Testing
Figure 9 Fault Activity Map of California
Figure 10 Geologic Map
Figure 11 Soils

TABLES

Table 1 Summary of Laboratory Testing Results
Table 2 Results of Corrosion Testing
Table 3 Regional Faults and Activity
Table 4 List of Major Historic Earthquakes
Table 5 Retaining Wall Design Parameters
Table 6 Seismic Design Response Spectrum

APPENDICES

Appendix A

INTRODUCTION

This report presents results from our Geotechnical Investigation for the Bear Creek/Bale Slough Project near Rutherford, Napa County, California. The project as currently planned, will consist of removal of the existing bridge structure, and construction of a bridge crossing the restored channel. Questa's geotechnical investigation included background geologic and seismic data review, a subsurface investigation including drilling, logging and sampling of two boreholes, sampling of soils from the creek bed, laboratory soils testing, engineering analysis, and development of geotechnical design recommendations.

FIELD INVESTIGATION

Subsurface Drilling Investigation

The subsurface drilling investigation included completion of two boreholes to depths of 42 feet below ground surface and 36 feet BGS. Drilling was performed on May 29, 2020, by Pearson Drilling of Forestville, California, using a truck mounted CME 75. Drilling utilized hollow-stem augers and sampling was performed using a 140-pound safety hammer dropped from a height of 30 inches. Samples were collected using the California Modified split-spoon sampler with 2.45 inch inside diameter brass liners and with the Standard Penetration Test sampler with 1.38 inch inside diameter**.** Boreholes were logged by a Staff Geologist under the supervision of our Senior Engineering Geologist. Borehole locations are presented on **Figure 1,** site location and borehole location plan.

Borehole 1 (B-1) was completed adjacent to the northeast side of the existing bridge. The log of borehole B-1 is presented as **Figure 2.** The soils as penetrated in this borehole include 2.0 feet of sandy gravel fill underlain by Silty Clay at 2.0 feet below ground surface (BGS). Very dark grayish brown to black, highly expansive clay and silty clay extended from 2.0 to 8.0 feet BGS. At 8.0 feet BGS, a color change to brown silty clay was penetrated and this extended to 14.0 feet BGS. At 14.0 feet,

Borehole 2 (B-2) was completed on the southwest side of Bear Creek adjacent to the northeast side of the existing bridge foundation. The log of B-2 is presented as **Figure 3.** The soils as penetrated in this borehole include 1.0 feet of sandy gravel fill underlain by silty sand with gravel fill from 1.0 to 2.5 feet below ground surface (BGS). From 2.5 feet to 9.0 feet BGS, very dark gray silty clay was penetrated. From 9.0 to 19.0 feet, very dark grayish brown silty clay with pebbles was found, which became wet and soft at 10 feet (the depth of groundwater). At 19.0 feet to 20.5 feet BGS, very dark brown, soft, sandy clay to clayey sand was found. Dark grayish brown medium stiff silty clay was penetrated from 20.5 to 23 feet BGS and was underlain by stiff to very stiff brown silty clay from 23 feet to 39 feet BGS. Dark yellowish brown sandy clay was penetrated from 39 to 42 feet BGS, the total depth of the borehole.

All boreholes were logged in accordance with the Unified Soil Classification System (ASTM D 2487). **Figure 4** presents a summary of the Unified Soil Classification System and a Key to Test Data.

LABORATORY TESTING

Laboratory testing was performed on selected soil samples from the boreholes. Laboratory testing was performed in Questa's laboratory in general accordance with American Society for Testing and Materials (ASTM) standards for moisture content, dry density, particle size analysis, and liquid and plastic limits (including plasticity index). We also performed unconfined compressive strength testing using the pocket penetrometer. A brief explanation of testing performed follows.

Moisture/Density

Moisture content and dry density testing were performed on selected soil samples to characterize the moisture content and dry density of material throughout the soil column. Testing was performed in accordance with ASTM 2937. In this test, the dry density of the soil is determined by a mathematical relationship between moisture content and wet density of the soil sample. Results of moisture-density testing are summarized on the borehole logs (**Figures 2** and **3**) as well as on **Table 1**.

Particle Size Analysis

Particle size analysis testing was performed in accordance with ASTM D 422. Samples collected from each of the boreholes were tested for grain size and percent passing the no. 200 sieve (silt + clay percent). Testing was also performed on samples collected from the creek channel bed. Results of the particle size analysis from the boreholes are presented on **Figure 5** and **Figure 6,** and summarized on **Table 1.** Results for the creek bed samples are summarized in **Table 1** and included in **Appendix A**.

Liquid Limit, Plastic Limit and Plasticity Index

Testing of liquid limit, plastic limit and plasticity index were performed in accordance with ASTM D 4318. Samples collected from each of the boreholes were tested by this method. Results are presented on **Figure 7** and **Figure 8,** and summarized on **Table 1.**

Strength Testing

Triaxial shear strength testing, unconsolidated, undrained (TXUU) was performed by Cooper Testing Labs. Results of TXUU testing are presented in **Appendix A**. Unconfined compressive strength testing was also performed on one sample by Cooper Testing Labs and presented in **Appendix A**. Results are also summarized on **Table 1** below.

A summary of laboratory test data for physical properties is presented on **Table 1**.

Table 1. Summary of Laboratory Testing Results

Sample Number	USCS Symbol	Moisture Content (%)	Dry Density (pcf)	Gravel (%)	Sand (%)	Percent Passing #200 (% fines)	Liquid Limit (%)	Plastic Limit (%)	PI	Shear Strength (psf)
B-1 @ 2.5'	CH	15.4	91.7	--	--	--	--	--	--	--
B-1 @ 3.5-5'	CH	--	--	0.1	3.3	96.6	72	31	41	--
B-1 @ 5'	CH	24.5	92.2	--	--	--	--	--	--	--
B-1 @ 6'	CH	23.5	99.6	---	--	--	--	--	--	4,214
B-1 @ 6.5-8'	CH	22.1	--	0.3	33.0	66.7	66	31	35	--
B-1 @ 9.5'	CH	31.3	85.4	--	--	--	--	--	--	--
B-1 @ 10.5-12'	CH	--	--	--	--	--	53	28	25	--
B-1 @ 14.5'	CH	31.6	84.8	--	--	--	--	--	--	--
B-1 @ 19.5'	CH	38.4	79.3	--	--	--	--	--	--	--
B-2 @ 2'	CH	12.1	93.9	--	--	55.7	55	25	30	--
B-2 @ 5'	CH	23.5	87.1	--	--	--	--	--	--	--
B-2 @ 9.5'	CH	34.2	81.9	--	--	--	--	--	--	--
B-2 @ 14.0'	CL	--	--	0	20.3	79.7	--	--	--	--
B-2 @ 14.5'	CL	42.3	78.1	--	--	--	31	21	10	--
B-2 @ 15'	CL	44.3	76.3	--	--	--	--	--	--	676
B-2 @ 19'	SC	21.5	106.4	--	--	--	--	--	--	1,260
B-2 @ 20'	SC	22.8	102.8	10.1	46.9	43.0	25	18	7	--
B-2 @ 40'	CL	--	--	0	29.7	60.3	39	24	15	--
Creek Bed Sample #1	SW	--	--	42.9	52.1	5.0	--	--	--	--
Creek Bed Sample #2	GW	--	--	53.1	43.1	3.8	--	--	--	--
Creek Bed Sample #3	GW-GM	--	--	54.9	34.4	10.7	--	--	--	--
Creek Bed Sample #4	GM	--	--	57.2	30.7	12.1	--	--	--	--
Creek Bed Sample #5	GW-GM	--	--	50.1	41.6	8.3	--	--	--	--
Creek Bed Sample #6	SW	--	--	38.7	57.9	3.4	--	--	--	--
Creek Bed Sample #7	GW	--	--	55.3	40.6	4.1	--	--	--	--
Creek Bed Sample #9	GW-GM	--	--	44.4	42.4	13.2	--	--	--	--

Notes: USCS- Unified Soil Classification System; pcf- pounds per cubic foot; psf- pounds per square foot
PI-Plasticity Index

Corrosion Testing

Corrosion testing was performed on two soil samples collected from shallow soils in the boreholes. Based on the results of the corrosion analyses, the existing fill soils are considered non-corrosive by Caltrans standards (Caltrans Corrosion Guidelines). Caltrans considers a site to

be corrosive to foundation elements if one of the following conditions exists for the representative soil samples collected from the site:

- Chloride concentration is greater than or equal to 500 ppm
- Sulfate concentration is greater than or equal to 2000 ppm
- pH is 5.5 or less

However, the native soils present below the fill include a high percentage of volcanic source materials; therefore, we anticipate that the native soils may be corrosive to steel and to concrete. Type II/V concrete should be used for all concrete structures. The full laboratory test report by Cooper Testing Laboratory is presented in **Appendix A**.

Table 2. Results of Corrosion Testing

Sample Number	Resistivity@15.5C (As received) (Ohm-cm)	Chloride (mg/kg)	Sulfate (mg/kg)	pH	Moisture Content (%)
B-1 @ 3-3.5'	2,581	5	102	6.5	18.3
B-2 @ 2.5-4.0'	2,106	10	125	7.2	21.6

REGIONAL SEISMICITY

The project site is located within the Coast Ranges Geomorphic Province of northern California, a region of northwest trending ridges and valleys that stretches along much of the California Coast and is dissected by only a few structural depressions, the largest of which are San Francisco and San Pablo Bays. The ridges and valleys trend northwest to southeast due to fault geometry along the transform plate boundary between the North American and Pacific Plates. Scientists estimate as much as 5 to 6 centimeters of strain accumulates annually along the margin between the Pacific and North American Tectonic Plates. This strain is periodically released by fault slip that generates earthquakes along the San Andreas Fault System. For this reason, the Bay Area is among the most seismically active regions in the United States and there exists an approximately 72 percent chance of a major earthquake in the area within the next 30 years (Working Group on California Earthquake Probabilities, 2015).

FAULTING

The San Andreas Fault, for which the regional fault system is named, was responsible for the 1906 San Francisco and 1989 Loma Prieta earthquakes. This transform fault is the parent to many other major strike-slip faults in the region that share the overall motion between the plates, some of which have themselves generated significant earthquakes on human record.

The State of California has developed a system to assess the activity of faults called the Alquist-Priolo Earthquake Fault Zoning Act. Under this system, faults are classified active if they have ruptured at the ground surface in the last 11,000 years, which is within the Holocene Epoch. Faults that have ruptured between 1,600,000 (1.6 million) years ago and 11,000 years ago, within the Pleistocene Epoch, are considered conditionally or potentially active. Other faults that do not

show evidence of fault displacement within the last 1.6 million years are considered inactive. A Holocene-active fault must be investigated if structures are to be built in its proximity.

No active earthquake faults are located on the project site and the risk of fault rupture is considered low. The project site is not located within an Alquist-Priolo Earthquake Fault Zone. The nearest active earthquake fault trace in relation to the project site is the West Napa Fault, located approximately 8 miles to the southwest and the Green Valley Fault, located approximately 9 miles to the east (California Geological Survey, 2007; California Geological Survey, 2010). **Table 3** presents a summary of the regional active faults that could impact the site. No faults zoned as active by the State of California Geological Survey cross the subject area. **Figure 9** presents a map of the site location relative to regional faults.

Table 3. Regional Faults and Activity

Fault Name	Distance From Site (mi)	Direction From Site	Activity	Mean Characteristic Moment Magnitude*
West Napa	8	Southwest	Active	6.7
Green Valley	9	East	Active	6.8
Hunting Creek-Berryessa	10	East	Active	7.1
Maacama	13	West	Active	7.4
Healdsburg-Rodgers Creek	14	Southwest	Active	7.1
Collayomi	22	Northwest	Potentially Active	6.7
Great Valley	28	East	Active	7.1
Hayward	30	South	Active	7.3
San Andreas-North Coast Segment	33	West	Active	7.5
Bartlett Springs	34	North	Active	7.3

*WGCEP, 2007

Table 4 presents a summary of the major historic earthquakes in Central California located within approximately 50 miles of the project site with the date of occurrence, magnitude and the approximate distance and direction to the epicenter relative to the site location.

Table 4. List of Major Historic Earthquakes

Location	Date of Earthquake	Magnitude (Richter)	Distance From Site (mi)	Direction To Epicenter
South Napa	August 24, 2014	6.0	17	South
Napa	October 12, 1891	5.6	15	Southeast
Santa Rosa	August 9, 1893	5.6	15	Southwest
Santa Rosa	October 2 1969	5.6	16	West
Santa Rosa	October 2 1969	5.7	17	West
Mare Island	March 31, 1898	6.4	28	South
Great 1906 San Francisco Earthquake	April 18, 1906	7.8	50	Southwest
Hayward Fault	October 21, 1868	7.0	50	South

Source: California Geological Survey, 2013, California Historical Earthquake Online Database (M>=5.5)

REGIONAL GEOLOGY

Napa Valley was part of the seafloor during the Jurassic epoch (180 million years ago) through to the Miocene epoch (25 million years ago) and is presently underlain by sedimentary deposits varying in texture from mudstone to conglomerates. During the Pliocene (one to 10 million years ago) the valley was uplifted above sea level (ASL) and the Coast Ranges were formed. A period of volcanism spread volcanic rock over the mountain ranges and the valley marine sediments. Post-Miocene faulting resulted in the formation of the Mayacamas, Sonoma and the Howell mountains that form a perimeter around Napa Valley. After thousands of years of erosion and weathering, the volcanics have eroded forming streams and ridges. As uplift continued in the Coast Ranges, terraces were formed in the valley. Alluvial fans, terrace deposits and terrace cuts fill large parts of the valley.

SITE GEOLOGY

Geology of the project site as presented on Geologic Maps of the area (**Figure 10**) is characterized as consisting of active stream channel deposits that include predominantly gravel and sand with minor silt of Holocene age (Clahan and others, 2005). The nearest bedrock to the project site consist of deposits of the Sonoma Volcanics (Pliocene age) to the east, north and west consisting of andesite and various varieties of rhyolite tuff including agglomerate, tuff breccia, and welded tuff. These rock types are all present in gravels collected from the stream channel and as components of the alluvial deposits underlying the site.

SITE SOILS

The various types of soils in the vicinity of the Project site are shown on **Figure 11.** At the Bridge site, soils are mapped as the Clear Lake Soils as described below. This description is based on a USDA soil survey of Napa County, California (USDA, 1978, Soil Survey of Napa County, California).

Clear Lake Soils

Clear Lake soils consist of dark gray to light olive brown clay. It has low permeability. The over-wash unit found in the Project area has a 12 to 18-inch-thick layer of grayish brown fine sandy loam overlying the clay surface layer. This soil is subject to flooding and subsequent removal and deposition of coarse textured surface material.

Site soils encountered in our subsurface investigation include fill soils adjacent to the existing bridge abutments consisting of sandy gravel, and underlying expansive clay and silty clay alluvial soils. Also encountered were periodic beds of clayey sand. In the creek bed, sediments consist of sandy gravels.

GROUNDWATER

Groundwater was encountered in each of the two boreholes completed at the site at depths of 11 feet BGS in B-1 and 10 feet BGS in B-2. Groundwater levels will fluctuate seasonally, with higher groundwater levels during the rainy season and lower levels during dry periods and summer months.

LIQUEFACTION

Stream channel deposits in the Napa River basin and the area of Bear Creek and Bale Slough are generally considered to have a very high potential susceptibility to liquefaction (Sowers and others, 1998). Associated alluvial fan deposits can vary from a low to high potential susceptibility to liquefaction depending on the composition of the soils. Liquefaction susceptibility is related to several factors including the type of soil or sediment, density of the materials, gradation of materials, groundwater depth and other factors. Liquefaction occurs when pore pressures buildup in sand and silty sand soils during strong seismic ground shaking and causes a loss of soil strength. This loss of soil strength can lead to settlement of structures at the ground surface or settlement of piles or foundations in or above the liquefiable sediments. The regional mapping of liquefaction hazards in the area indicates that the site is located in an area of high potential for liquefaction.

Liquefaction Analysis

The predominance of the soils encountered during our subsurface investigation consists of clay, silty clay and sandy clay, with minor deposits of well-graded gravelly sand and clayey sand. The soils that are most susceptible to liquefaction consist of clean sands and silty sands, which were not found in our boreholes to the depth of drilling at approximately 42 feet BGS. Groundwater was present in each of the boreholes at depths of approximately 10 to 11 feet BGS. The predominance of the soils consisted of cohesive soils such as fat clay, sandy lean clay, and clayey sand. The potential for liquefaction of the soils in the top 42 feet below ground surface is considered low based on our subsurface exploration.

Sediment samples collected from the creek bed were also tested for particle size distribution. These creek bed sediments are composed predominantly of well-graded, poorly sorted, sandy gravels, silty gravels, and gravelly sand. These sediments are unlikely to undergo liquefaction during seismic shaking. Other sediments could be present in the stream channels and underlying the channel bottom that would be susceptible to liquefaction.

GEOTECHNICAL RECOMMENDATIONS

Based on our investigation we recommend that the replacement bridge structure be founded on a spread footing type foundation with footings deepened to approximately 5 to 6 feet below ground surface, the depth of stiff clay soils. A layer of non-expansive structural fill a minimum of 18 inches in thickness should be placed over the clay soils to provide a non-expansive buffer between the clay soils and the footings for the bridge. The non-expansive material can consist of

Class 2 aggregate base compacted to a minimum of 95 percent of the maximum dry density or controlled low strength material (CLSM) having a minimum strength of 100 psi at 28 days.

Site Preparation and Grading

Areas to be graded during bridge construction should be cleared and grubbed to a depth of 4 to 6 inches to remove vegetation and surface organic soils, or to the depth of subgrade soil preparation at the base of the road structural section which includes Class 2 aggregate base (AB) and roadway hot mix asphalt (HMA) surfacing.

Roadway Subgrade

Subgrade soils underlying road sections should be scarified to a minimum of twelve inches, moisture conditioned to 2 to 4 percent above the optimum moisture content, and compacted to a minimum of 90 percent of the maximum dry density as determined in the laboratory in accordance with ASTM D 1557. Subgrade under other fill areas should be similarly scarified, moisture conditioned, and recompacted to a minimum of 90 percent.

Aggregate Base (AB)

The replacement road section underlying hot mix asphalt/asphalt concrete pavement should consist of a minimum of 12 inches of Class 2 aggregate base (AB). AB should meet requirements of Sections 26 of the Caltrans Standard Specifications, including an R-value of 78 minimum, a sand equivalent of 22 minimum, and a durability index of 35 minimum. The AB should be free from organic matter. Aggregate base should be properly keyed-in and placed in uniform layers not exceeding 8 inches in loose thickness before compaction. Each layer should be watered or dried as required to bring the material to the required moisture content range, spread, graded and then compacted mechanically by means of suitable equipment, such as a vibratory drum roller. Each layer should be compacted to a minimum 95 percent of the maximum dry density at moisture contents within two percent of optimum moisture content in accordance with ASTM D 1557.

Hot Mix Asphalt (HMA)

Hot Mix Asphalt (HMA) pavement, formerly known as asphalt concrete (AC) pavement, should be a minimum of 4 inches in thickness. HMA should conform to Caltrans Standard Specifications Section 39.

Bridge Foundations

Based on results of our geotechnical investigation, the soils at the proposed bridge abutment locations have poor supporting characteristics for the proposed bridge foundations. However, bridges can be founded on spread footings provided that the soils underlying the proposed bridge abutments are excavated to a minimum depth of 18 inches below the bottom of the proposed footings and replaced with Controlled Low Strength Material (CLSM) also known as Controlled Density Fill (CDF). The CLSM should have a minimum strength of 100 psi at 28 days.

Spread Footings

For spread footings founded on CLSM over native clay soil, allowable bearing pressure of 2,000 pounds per square foot (psf) can be used for dead plus live loads, and can be increased by 33 percent for total loads, including wind or seismic forces. Resistance to lateral loads should be based on an equivalent fluid weight of 200 pcf on the face of the footing in clay soils. In addition, a friction coefficient of 0.35 can be used on the base of the footing on CLSM. If water is present in footings, it should be pumped out prior to placement of the concrete.

Retaining Wall Design Parameters

Retaining walls at the site must be designed to resist lateral earth pressures plus additional lateral pressures that may be caused by surcharge loads such as seismic forces. Walls that are free to rotate should be designed for active lateral earth pressures. If walls are restrained by rigid elements to prevent rotation, then they should be designed for at-rest earth pressures. Retaining walls backfilled with granular soils should be designed to resist lateral earth pressures due to an equivalent fluid having unit weight as shown in **Table 5**.

Table 5. Retaining Wall Design Parameters

	Active Pressure pounds per cubic foot (pcf)	At-Rest Earth Pressure (pcf)
Above Design Groundwater Table Elevation	50	70
Below Design Groundwater Table Elevation	86	96

Retaining walls that are designed to be fully drained and include a backdrain can be designed for active pressures or at-rest earth pressure in accordance with the values given in **Table 4** for the above design groundwater condition. Retaining walls that are designed to be located below the design groundwater table or that do not include a backdrain should be designed to withstand the pressure of saturated soils as presented in **Table 4** for below design groundwater table elevation.

The seismic conditions should be determined by adding the pressures from earthquake loading to active pressure on the retaining walls. All walls greater than 6 feet in height should include seismic pressure. We recommend an incremental seismic pressure of 23H in pounds per square foot (psf), where H is the height of the retaining wall in feet. The pressure distribution may be considered to be an inverted triangle with the maximum pressure at the top and zero on the bottom. The resultant of this force may be assumed to be located at 1/3 the height of the wall below the top of the wall. Unit weight (total) of the existing soils is approximately 120 pcf. Unit weight (total) of aggregate base granular backfill is approximately 135 pcf for recycled and 145 pcf for quarried material. The effective internal angle of friction of the sandy clay existing soils can be assumed to be 25 degrees and the aggregate base or gravel backfill 40 degrees for design purposes. The design groundwater elevation for the project should be 10 feet below the road surface.

Drainage Measures

Retaining walls located above the design groundwater level should be back-drained with Caltrans Class 2 Permeable drain material and a perforated four-inch diameter HDPE or SDR 35 pipe covered in a minimum of 36 inches of ¾-inch diameter crushed rock and wrapped in filter fabric such as Mirafi 160N. This subsurface drain should extend to at least the base of the grade beam or footing, have a minimum slope of two percent and be gravity drained by connection to a non-perforated HDPE tight line with water transmitted to an energy dissipating structure at the channel.

Seismic Design Response Spectrum

Bridge

A replacement bridge constructed at the site should be designed in accordance with seismic design criteria of Caltrans ARS Online Version 3.0.2. The response spectrum should be based on the following spectrum derived based on the USGS 2014 hazard data for a 975-year return period. The project seismic design criteria presented in **Table 6** were calculated in accordance with the ARS Online Version 3.0.2 calculator on 8/11/2020.

Latitude: 38.467534 Longitude: -122.423513 Vs30 (m/s): 250

Table 6. Seismic Design Response Spectrum

Recommended Response Spectrum				
Period (Second)	Caltrans Online Spectral Acceleration (Sa2014) (g)	Adjusted for Basin Effect	Adjusted for Near Fault Amplification	Final Adjusted Spectral Acceleration (g)
0 (PGA)	0.61	1	1	0.61
0.10	1.03	1	1	1.03
0.20	1.42	1	1	1.42
0.30	1.58	1	1	1.58
0.50	1.5	1	1	1.50
0.75	1.2	1	1.1	1.32
1.0	0.99	1	1.2	1.19
2.0	0.51	1	1.2	0.61
3.0	0.33	1	1.2	0.40
4.0	0.23	1	1.2	0.28
5.0	0.17	1	1.2	0.20

Deaggregation (based on 2014 hazard data)- Mean Magnitude (for PGA) 6.74;
Mean site-source distance 12 km (8 miles).

CONCLUSIONS

The project is feasible from a Geotechnical standpoint, provided that our recommendations are followed during design and construction of the project. Provided that the site is properly prepared and the structures and foundations are designed and constructed as recommended, we estimate that normal post-construction settlement for the bridge will be relatively small, less than 1.0 inches. Differential settlements from the west bridge abutment to the east bridge abutment

could be as much as 0.75 inches. Up to 90% of this settlement would be expected to occur during construction and within the first 12 months after completion of the foundations.

LIMITATIONS

This investigation was performed in accordance with present geotechnical and engineering geologic standards applicable to this project. In our opinion, the scope of services adequately supports the conclusions and recommendations presented. The findings are valid now, but should not be relied upon after two years without our review.

The recommendations of this report are based upon the assumption that the conditions do not deviate from those interpreted from the surface observations of this investigation and review of available subsurface information developed by others. If any variation or undesirable conditions are encountered during construction, or if the proposed construction differs from that planned at the present time, we should be notified so that supplemental recommendations can be given. The recommendations of this report are intended for the site described only, and must not be extended to adjacent areas.

This report is issued with the understanding that it is the responsibility of the owner to ensure that contractors and subcontractors carry out the recommendations presented.

BIBLIOGRAPHY

Andrus, R. D., and Stokoe, K. H., 2000, Liquefaction Resistance of Soils from Shear-Wave Velocity, Journal of Geotechnical and Geoenvironmental Engineering, vol. 126, no. 11, pp.1015–1025.

California Geological Survey, 2007(Interim Revision), Fault Rupture Hazard Zones in California, CGS Special Publication 42

California Geological Survey, 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, CGS Special Publication 117A.

California Geological Survey, 2010, Fault Activity Map of California, Geologic Data Map No. 6.

California Geological Survey, 2013, California Historical Earthquake Online Database (M>=5.5).

Caltrans, 2020, ARS Online Version 3.0.2, accessed on 8/11/2020.

Clahan, K. B. and others, 2005, Preliminary Geologic Map of the Rutherford 7.5-minute Quadrangle, Sonoma and Napa Counties, California: A Digital Database, Version 1.0, California Geological Survey.

NCEER, 1997, Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils, edited by Youd, T.L., Idriss, I.M., Technical Report No. NCEER 97-0022, December 31, 1997.

Seed, H. B., and Idriss, I. M., 1971, Simplified Procedure for Evaluating Soil Liquefaction Potential, Journal of the Soil Mechanics and Foundations Division, ASCE, vol. 97, no. SM9,1249–1273.

Seed, H. B., Tokimatsu, K., Harder, L. F., and Chung, R., 1985, Influence of SPT Procedures in Soil Liquefaction Resistance Evaluations, Journal of Geotechnical Engineering, ASCE, vol. 111, no. 12, pp. 1425–1445.

Sowers, Janet M., Noller, Jay S., and Lettis, William R., 1998, Quaternary geology and liquefaction susceptibility, Napa, California 1:100,000 quadrangle: A digital database: U.S. Geological Survey Open-File Report 98-460.

Tokimatsu, K. and Seed, H.B., 1987, Evaluation of Settlements in Sands Due to Earthquake Shaking, Journal of Geotechnical Engineering, 113 (8), 861-878.

U.S. Geological Survey and California Geological Survey, 2006, Quaternary fault and fold database for the United States, accessed Oct 18, 2013, from USGS web site: http//earthquake.usgs.gov/regional/qfaults/

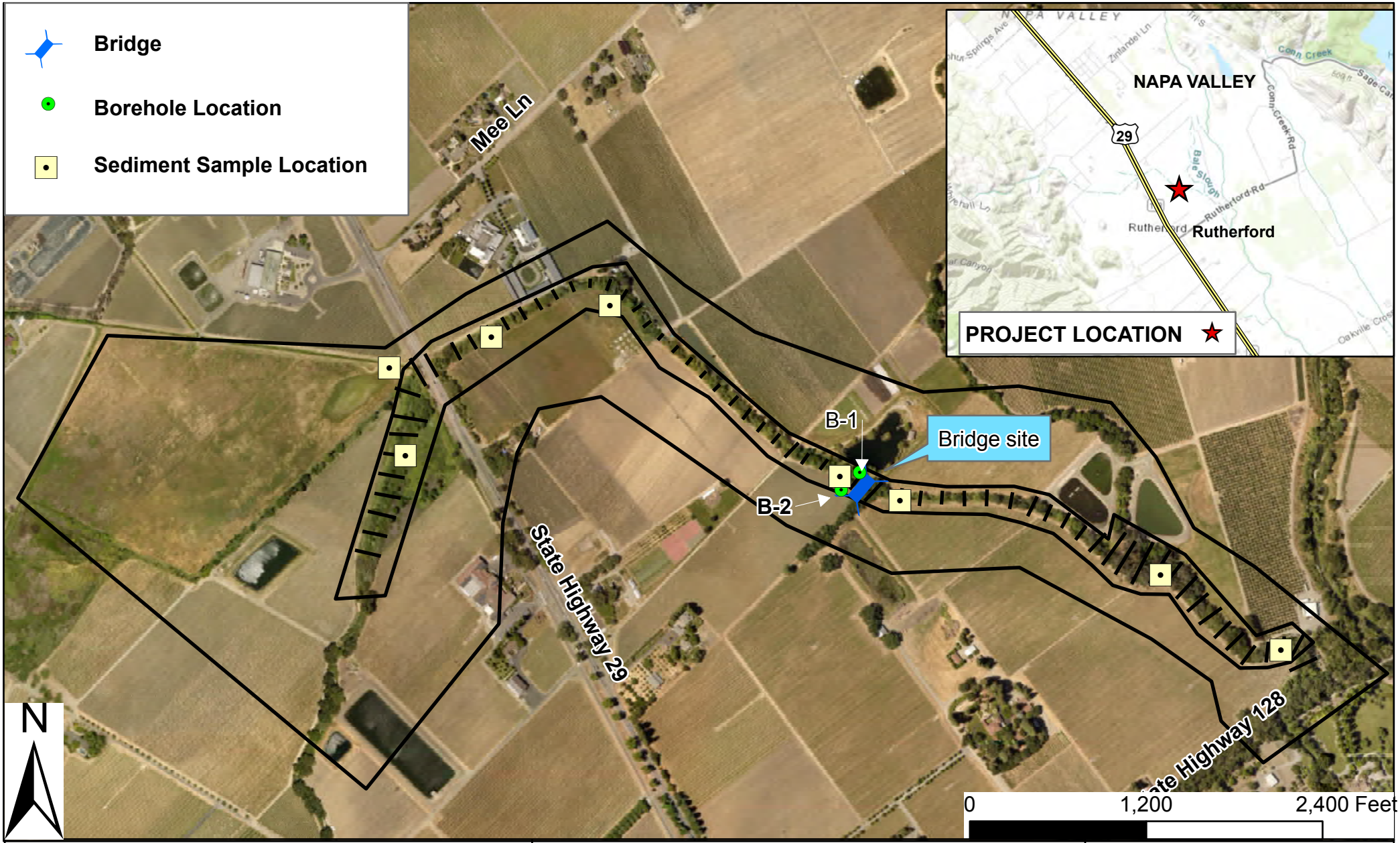
U.S. Geological Survey, California Geological Survey and Southern California Earthquake Center, 2014, Uniform California Earthquake Rupture Forecast, Version 3 (UCERF3)—The Time-Independent Model, USGS Open-file report 2013-1165.

Wills, C.J., Weldon, R.J., II, and Bryant, W.A. 2008, California fault parameters for the National Seismic Hazard Maps and Working Group on California Earthquake Probabilities, Appendix A in The Uniform California Earthquake Rupture Forecast, version 2 (UCERF 2): U.S. Geological Survey Open-File Report 2007-1437A, and California Geological Survey Special Report 203A, 48 p.

Working Group on California Earthquake Probabilities 2007 (Field and others), 2008, The Uniform California Earthquake Rupture Forecast, Version 2, USGS Open File Report 2007-1437.

Working Group on California Earthquake Probabilities, 2015, Long-term time-dependent probabilities for the third uniform California earthquake rupture forecast (UCERF3), Bulletin of the Seismological Society of America.

FIGURES



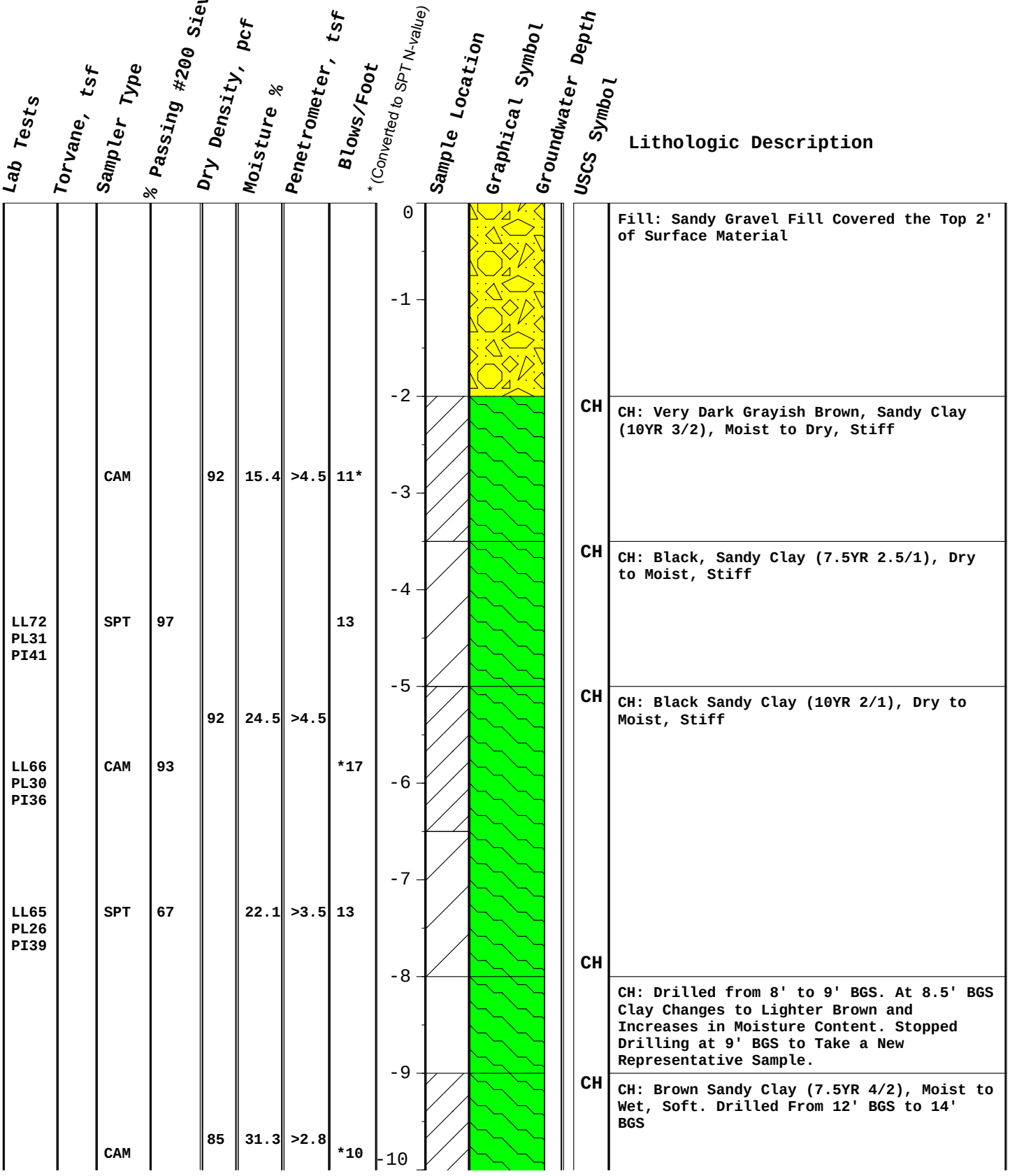
Project Location

Bale Slough-Bear Creek Restoration Project

Rutherford, California

QUESTA ENGINEERING CORP.

Figure 1



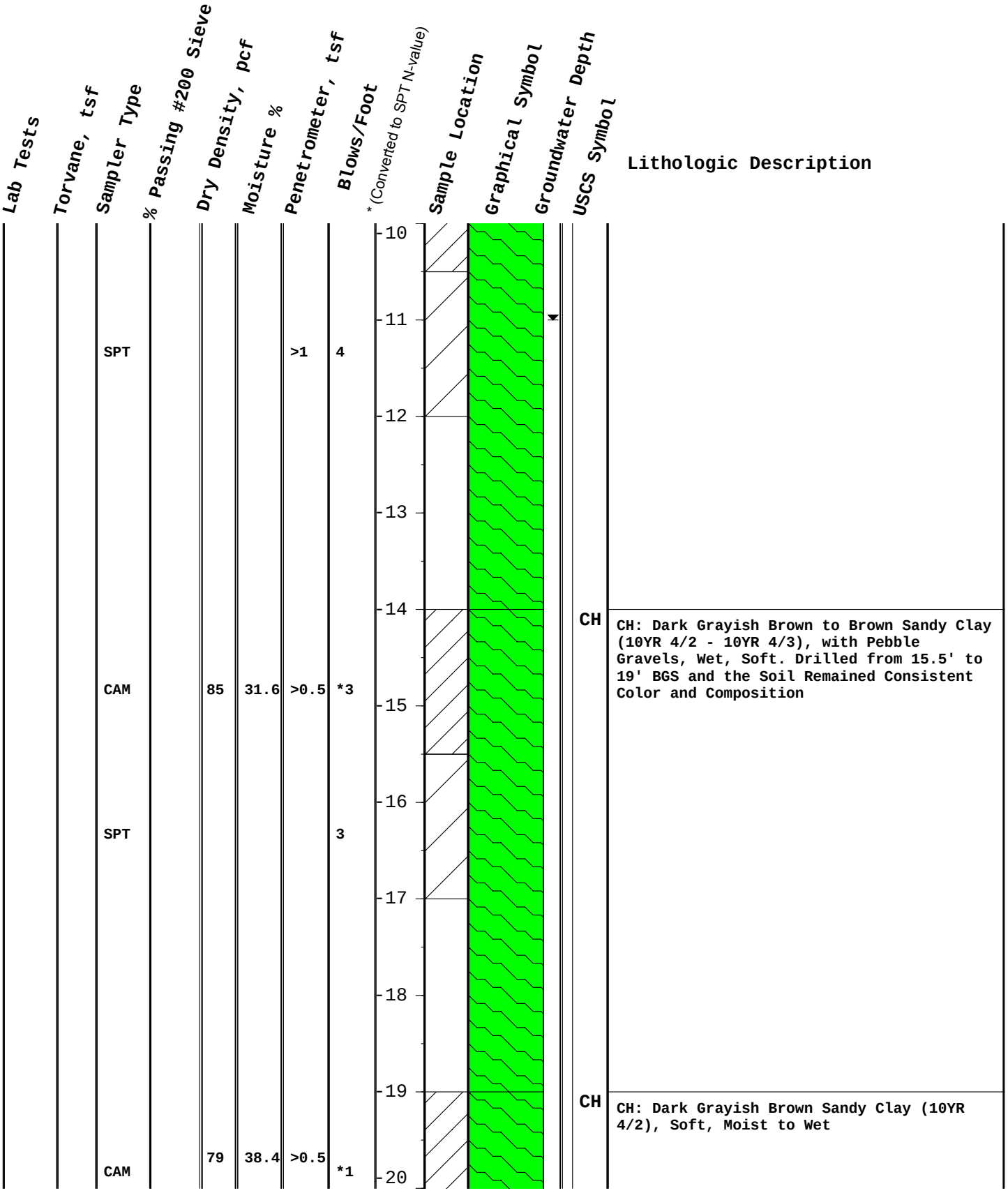
QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

LOG OF BOREHOLEB-1

BALE SLOUGH-BEAR CREEK

RUTHERFORD, CA

Figure 2



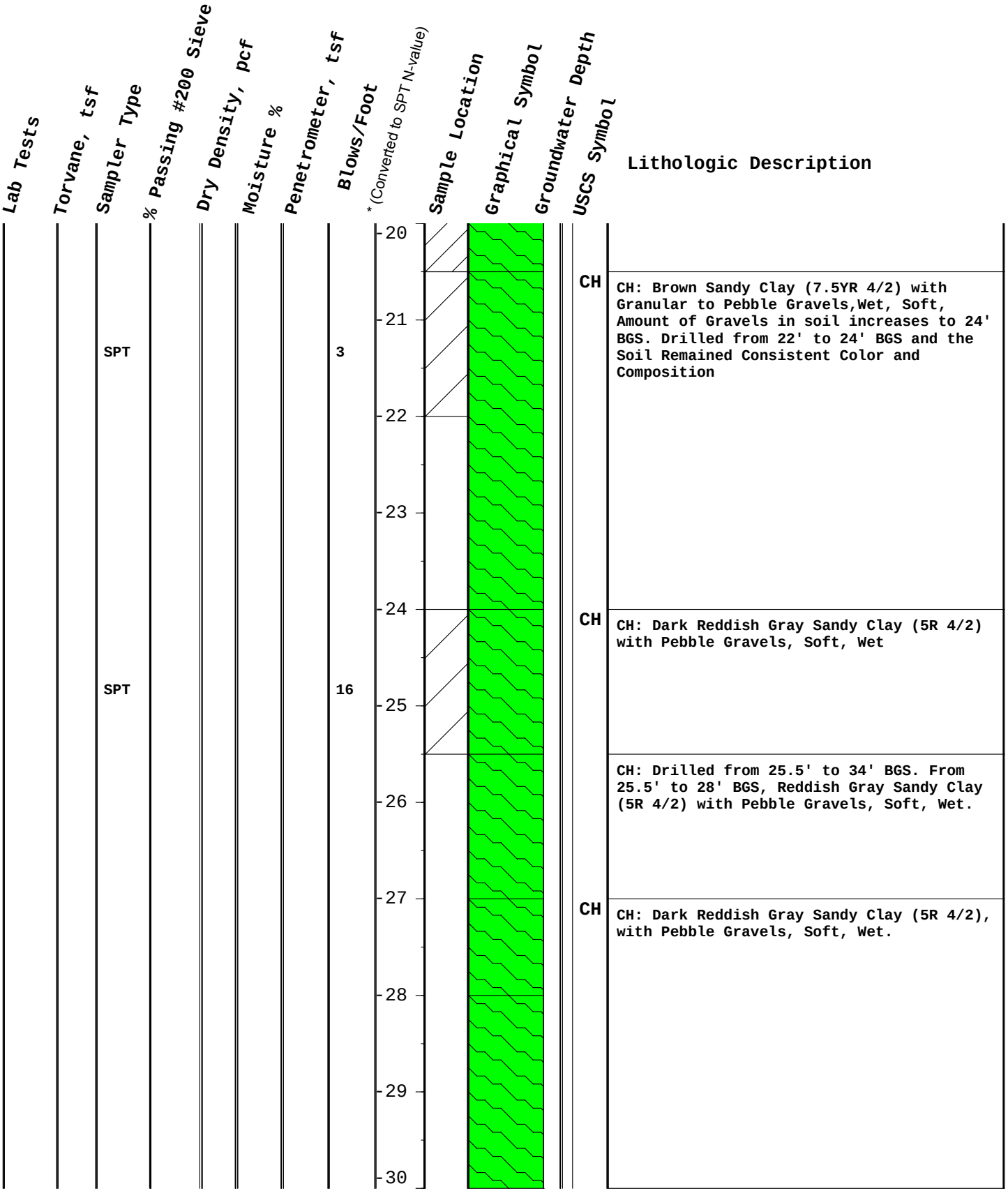
QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

LOG OF BOREHOLEB-1

BALE SLOUGH-BEAR CREEK

RUTHERFORD, CA

Figure 2



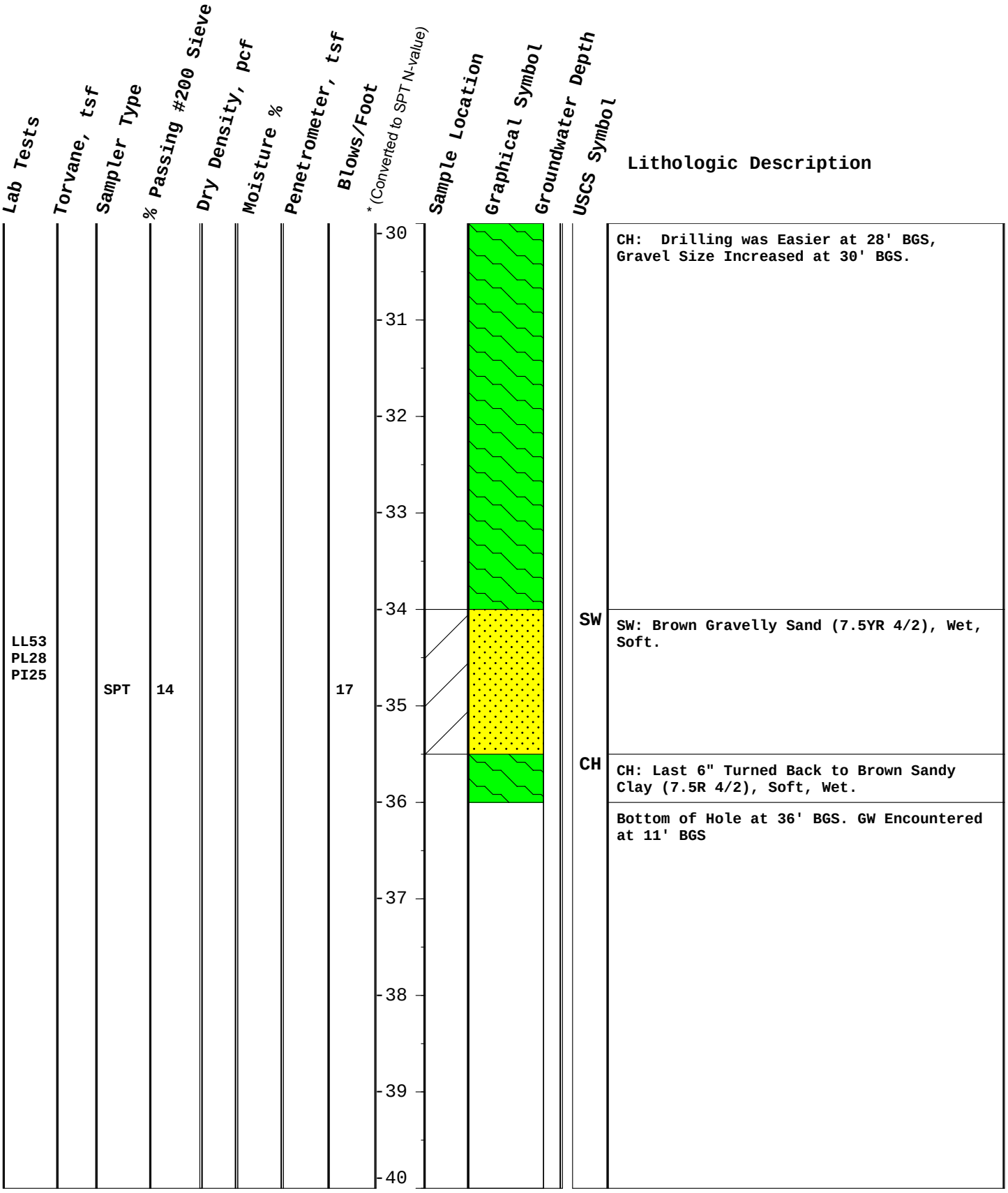
QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

LOG OF BOREHOLEB-1

BALE SLOUGH-BEAR CREEK

RUTHERFORD, CA

Figure 2



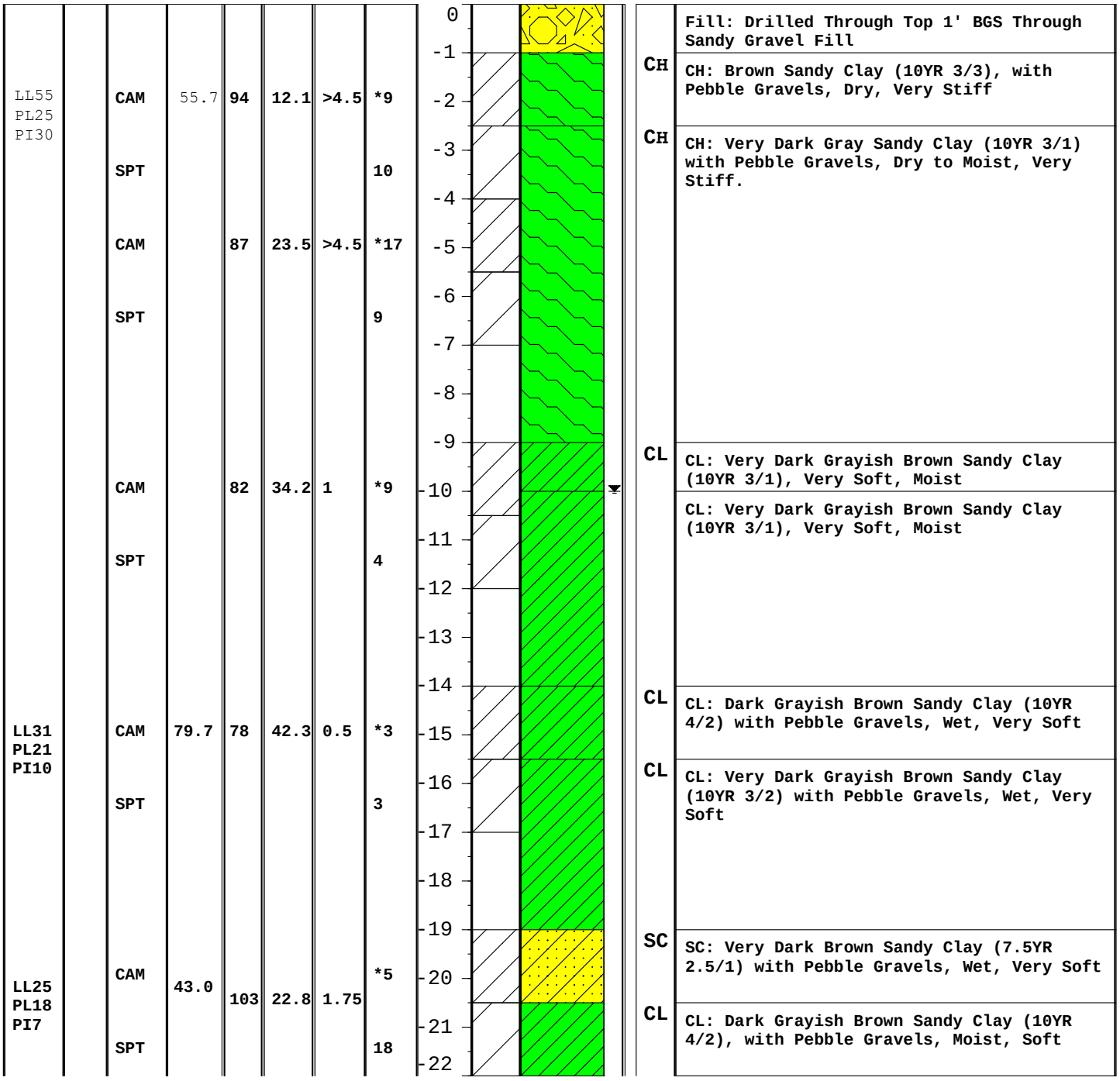
QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

LOG OF BOREHOLEB-1

BALE SLOUGH-BEAR CREEK

RUTHERFORD, CA

Figure 2



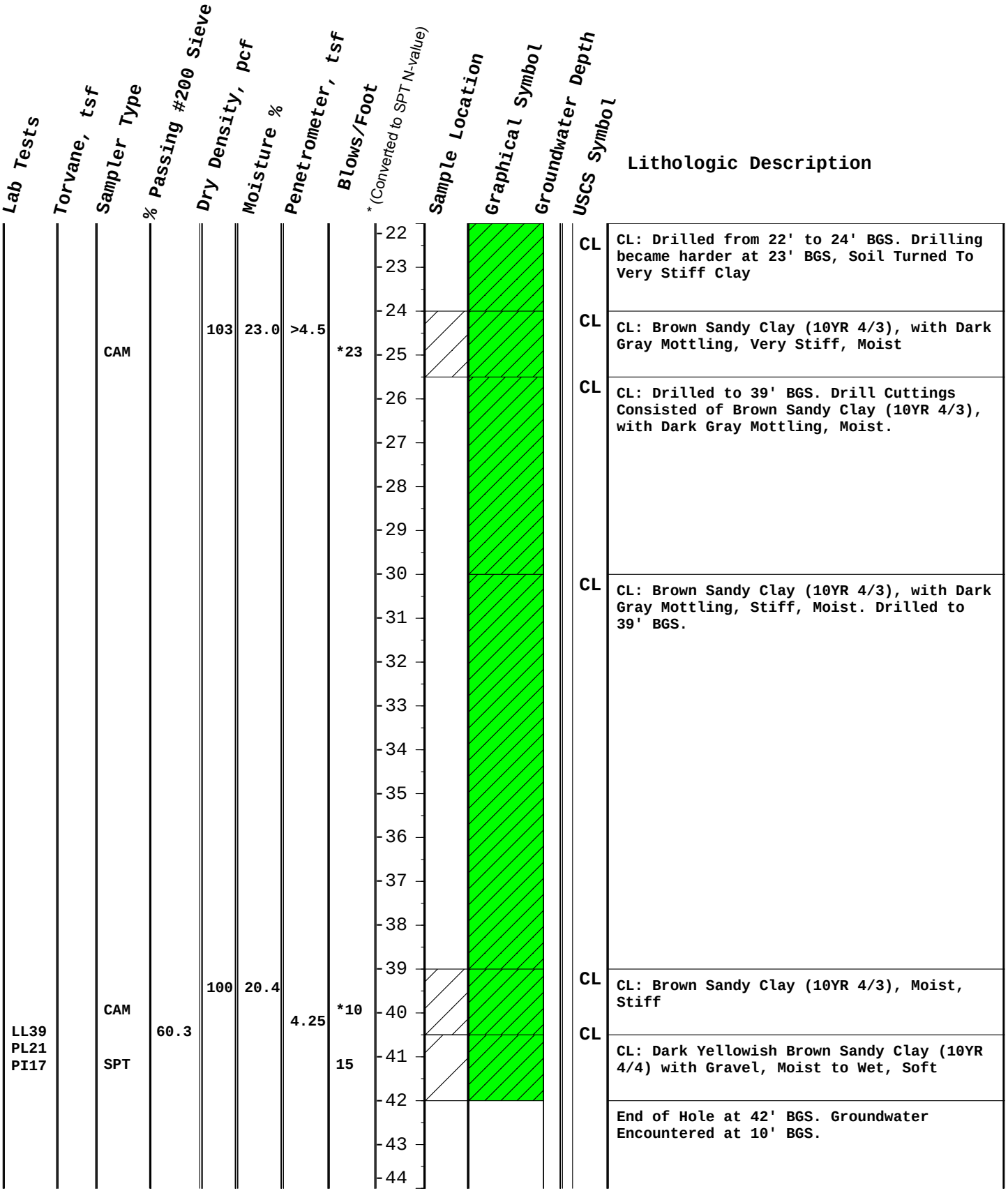
QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

LOG OF BOREHOLEB-2

BALE SLOUGH-BEAR CREEK

Rutherford, CA

Figure 3



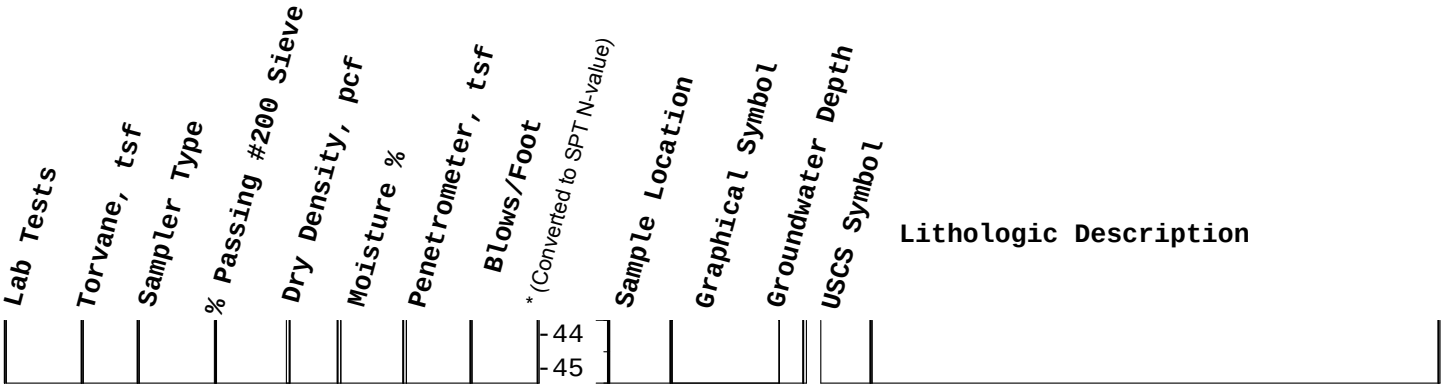
QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

LOG OF BOREHOLEB-2

BALE SLOUGH-BEAR CREEK

Rutherford, CA

Figure 3



QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

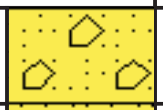
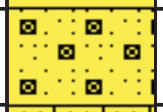
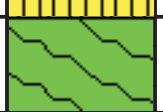
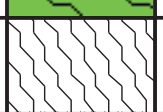
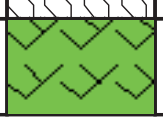
LOG OF BOREHOLEB-2

BALE SLOUGH-BEAR CREEK

Rutherford, CA

Figure 3

SOIL CLASS KEY.CDR

MAJOR DIVISION					TYPICAL NAMES
COARSE GRAINED SOILS MORE THAN HALF IS LARGER THAN #200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN #4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		Well graded Gravels, Gravel-Sand mixtures
			GP		Poorly graded Gravels, Gravel-Sand mixtures
		GRAVELS WITH OVER 12% FINES	GM		Silty Gravels, poorly graded, Gravel-Sand-Silt mixtures
			GC		Clayey Gravels, poorly graded Gravel-Sand-Clay mixtures
	SANDS MORE THAN HALF COARSE FRACTION IS LARGER THAN #4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		Well graded Sands, Gravelly-Sands
			SP		Poorly graded Sands, Gravelly-Sands
		SANDS WITH OVER 12% FINES	SM		Silty Sands, poorly graded, Sand-Silt mixtures
			SC		Clayey Sands, poorly graded, Sand-Clay mixtures
FINE GRAINED SOILS MORE THAN HALF IS SMALLER THAN #200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML		Inorganic Silts and very fine Sands, rock flour, Silty or Clayey fine Sands, or Clayey-Silts with slight plasticity
			CL		Inorganic Clays of low to medium plasticity, Gravelly Clays, Sandy Clays, Silty Clays, lean Clays
			OL		Organic Clays and Organic Silty Clays of low plasticity
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH		Inorganic Silts, micaceous or diatomaceous fine Sandy or Silty Soils,elastic Silts
			CH		Inorganic Clays of high plasticity, fat Clays
			OH		Organic Clays of medium to high plasticity, organic Silts
HIGHLY ORGANIC SOILS			Pt		Peat and other highly organic soils

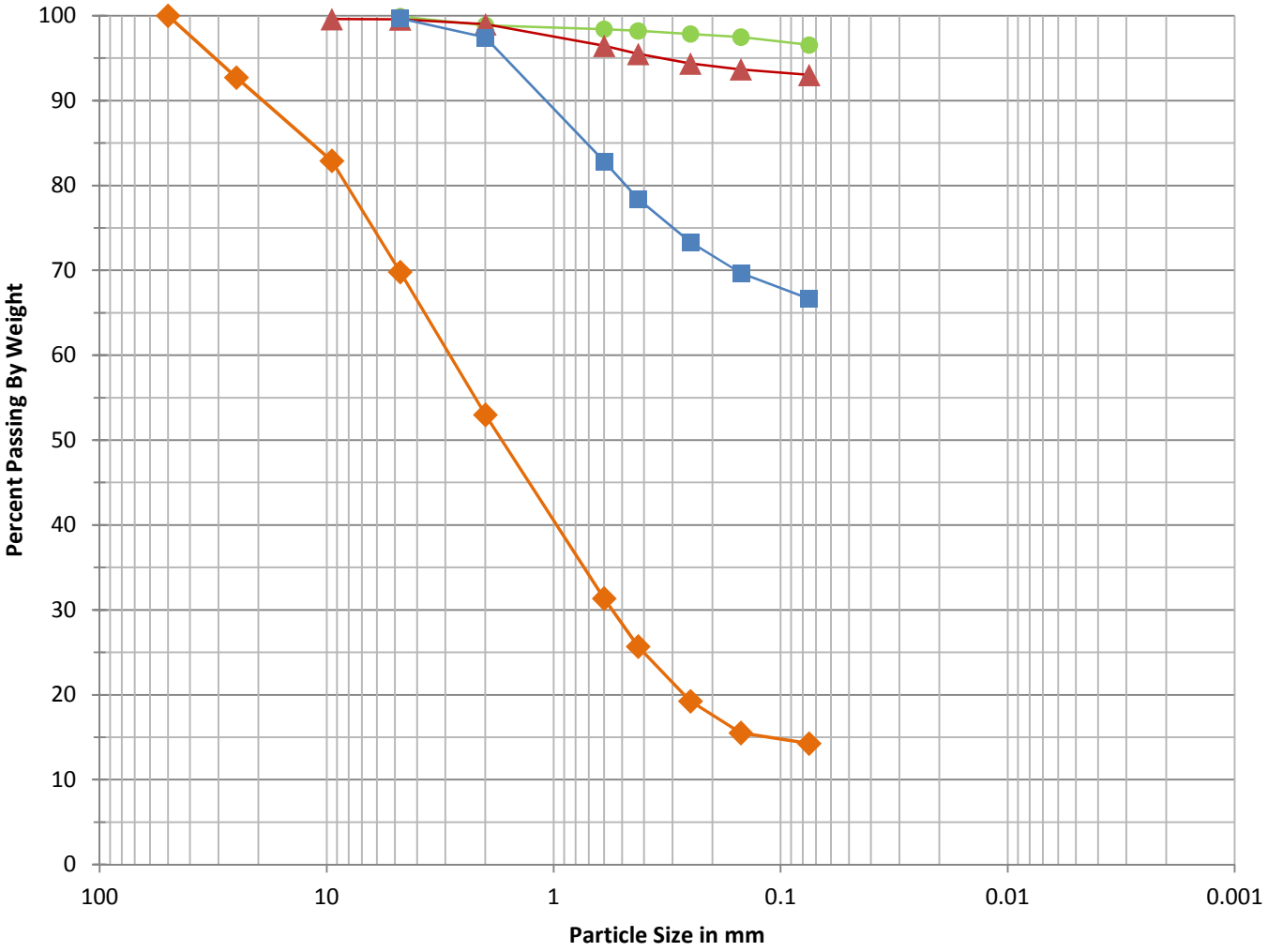
BOH	Bottom of hole	140 #	140 pound hammer dropped 30“
SPT	Standard Penetration Test Sampler (1.38“ inside diameter)		
CAM	California Modified Split Barrel Samplers (S&H) (2.5“ inside diameter)	LL, PL, PI	Liquid Limit, Plastic Limit, Plasticity Index

Questa Engineering Corporation
P.O. Box 70356
1220 Brickyard Cove Road
Point Richmond, CA 94807
Phone: (510) 236-6114 FAX: (510) 236-2423

UNIFIED SOIL CLASSIFICATION SYSTEM AND KEY TO ABBREVIATIONS

FIGURE 4

Particle Size Analysis



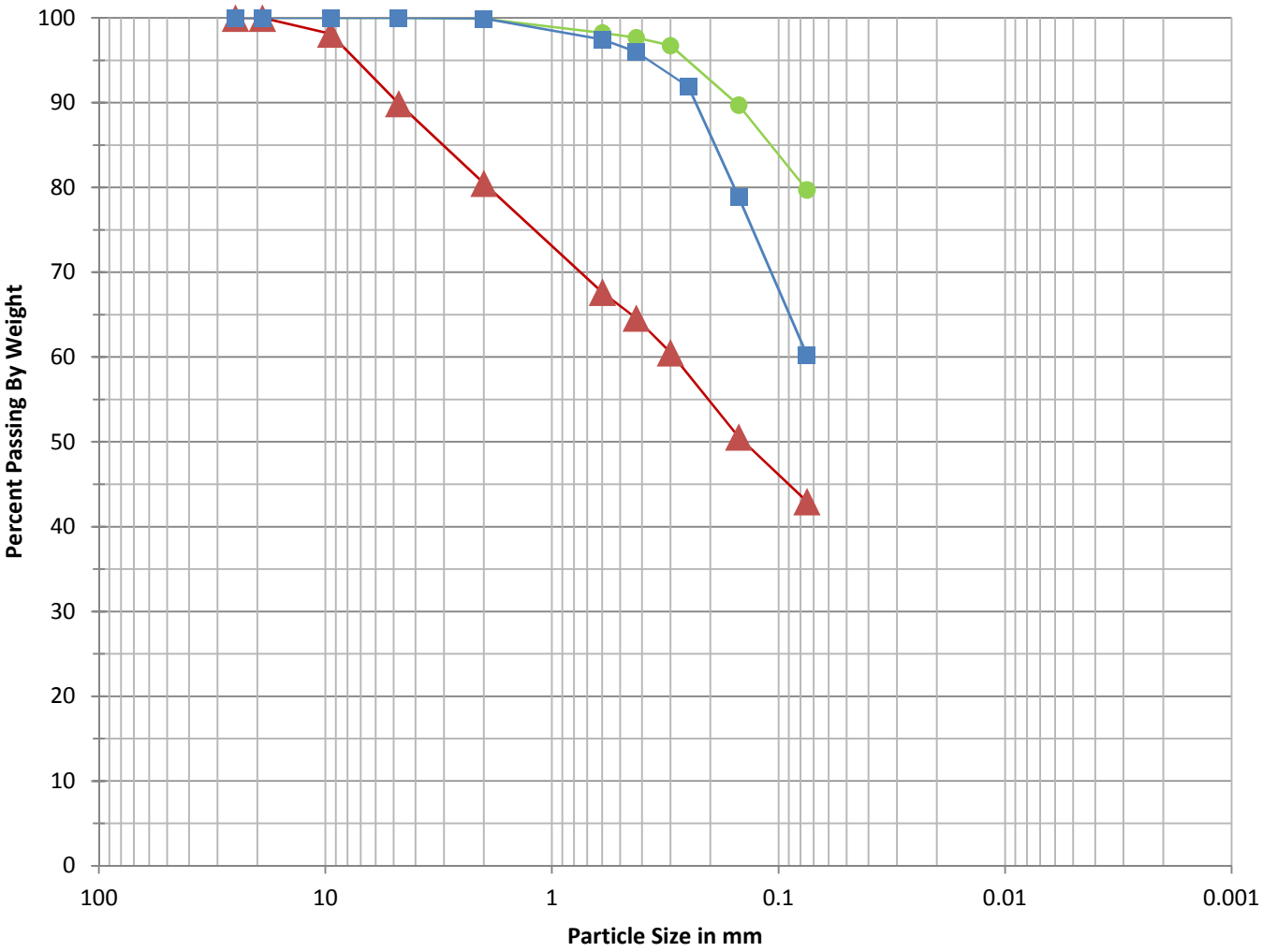
Gravel		Sand			Silt	Clay
Coarse	Fine	Coarse	Medium	Fine		

Symbol	Source
●	B-1, 3.5'-5.0'
▲	B-1, 5.5'-6.0'
■	B-1, 6.5'-8.0'
◆	B-1, 34'-35.5'

QUESTA ENGINEERING CORP
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Particle Size Analysis	Figure
Geotechnical Investigation Bale Slough-Bear Creek Rutherford, Ca	5

Particle Size Analysis



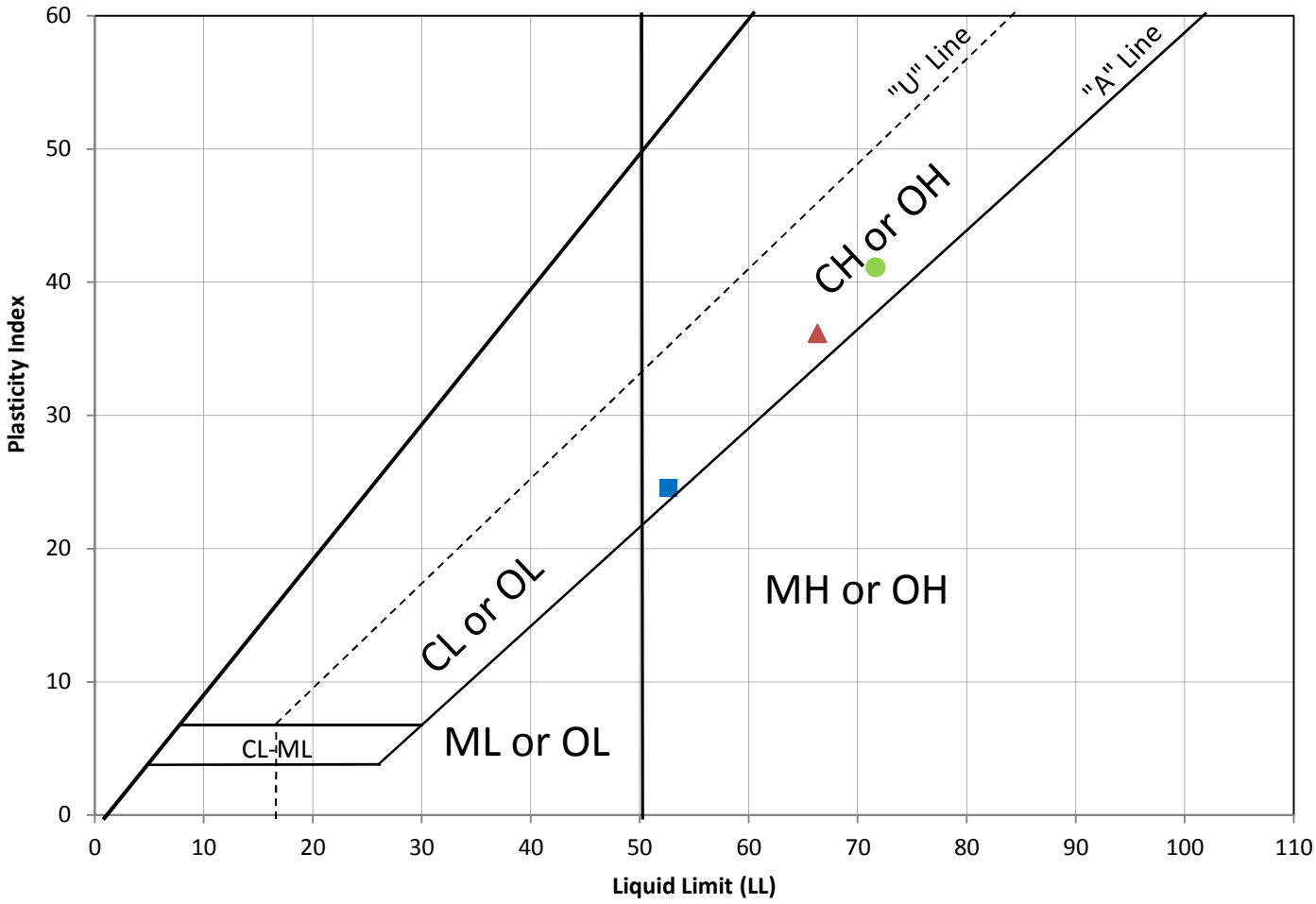
Gravel		Sand			Silt	Clay
Coarse	Fine	Coarse	Medium	Fine		

Symbol	Source
●	B-2 14.0-14.5 feet BGS
▲	B-2 20.0-20.5 feet BGS
■	B-2 40.0-40.5 feet BGS

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Particle Size Analysis	Figure
Geotechnical Investigation Bale Slough-Bear Creek Rutherford, Ca	6

Atterberg Limits

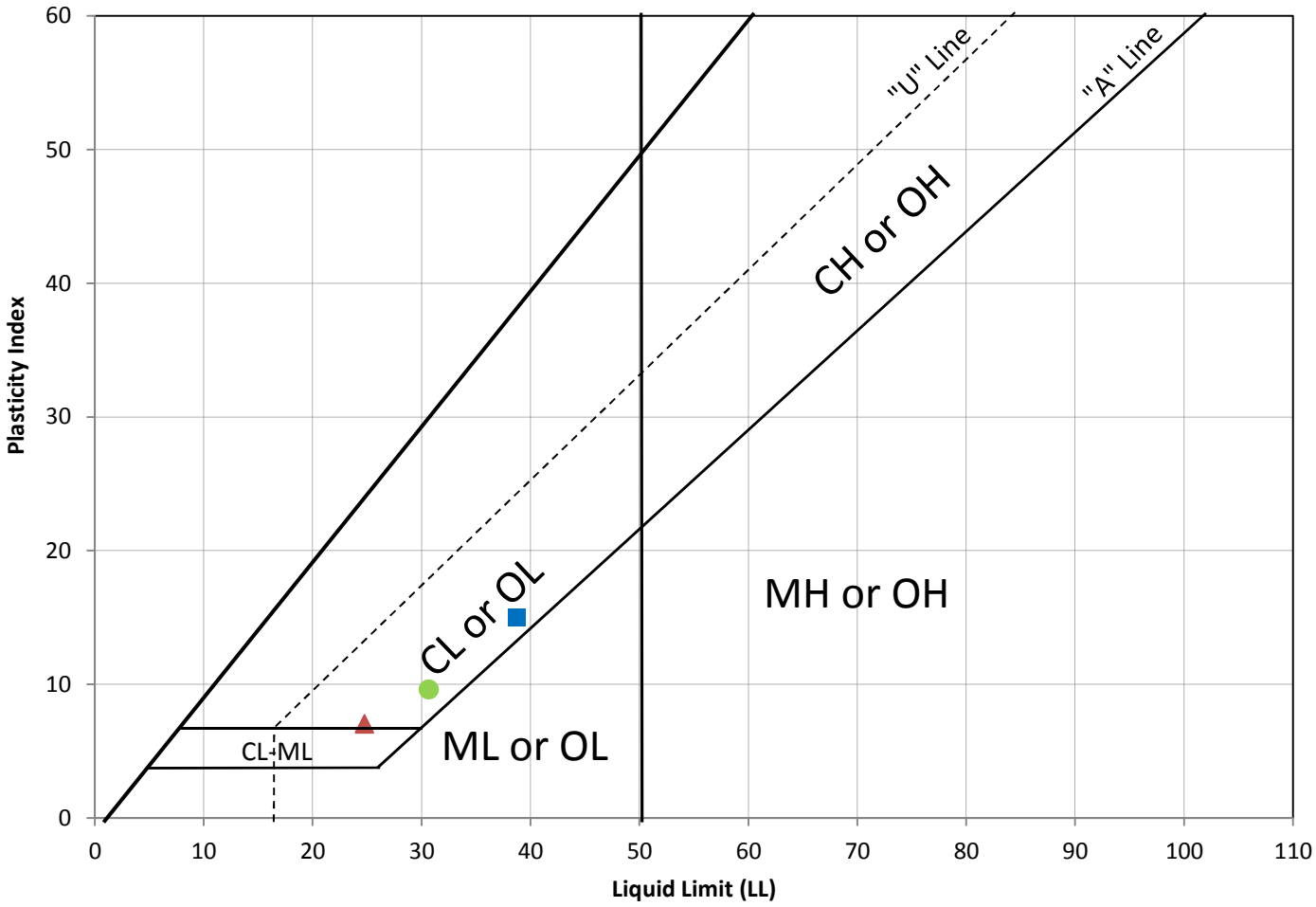


Symbol	Classification & Source	Liquid Limit	Plastic Limit	Plasticity Index	% Passing #200 Sieve
●	Silty Clay (CH), B-1 3.5-5.0'	72	31	41	96.6
▲	Silty Clay (CH), B-1 5.5-6.0'	66	30	36	93.0
■	Sandy Clay (CH), B-1 10.5-12.0'	53	28	25	NA

QUESTA ENGINEERING CORP
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Atterberg Limits (ASTM D4318)	Figure
Geotechnical Investigation Bale Slough-Bear Creek Rutherford, Ca	7

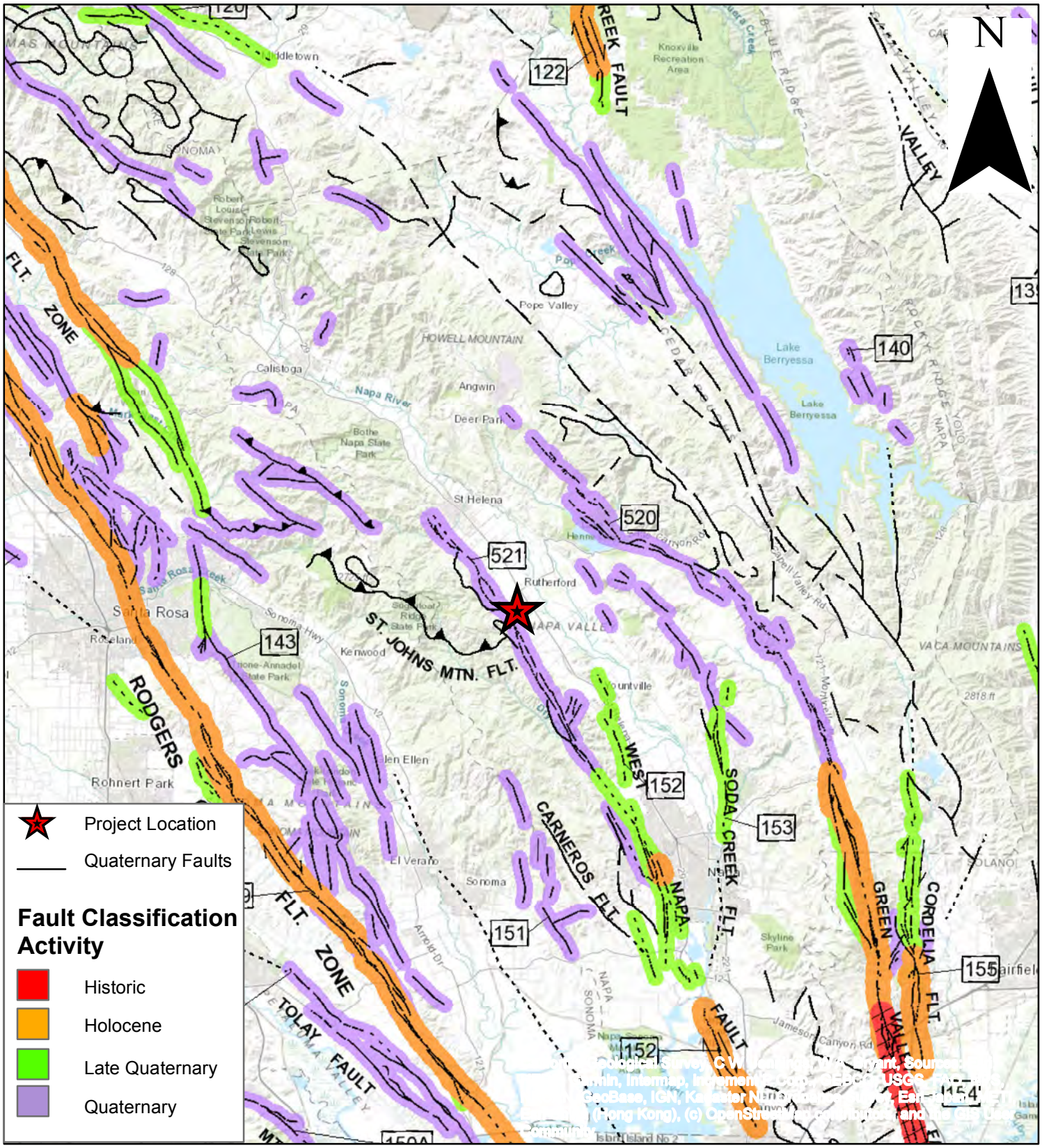
Atterberg Limits



Symbol	Classification & Source	Liquid Limit	Plastic Limit	Plasticity Index	% Passing #200 Sieve
●	Sandy Clay (CL), B-2 14.5-15.0'	31	21	10	79.7
▲	Clayey Sand (SC), B-2 20.0-20.5'	25	18	7	43.0
■	Sandy Clay (CL), B-2 40.0-40.5'	39	24	15	60.3

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Atterberg Limits (ASTM D4318)	Figure
Geotechnical Investigation Bale Slough-Bear Creek Rutherford, Ca	8



Reference: California Geological Survey, 2010, Fault Activity Map of California, Geologic Data Map No. 6.

Regional Fault Map

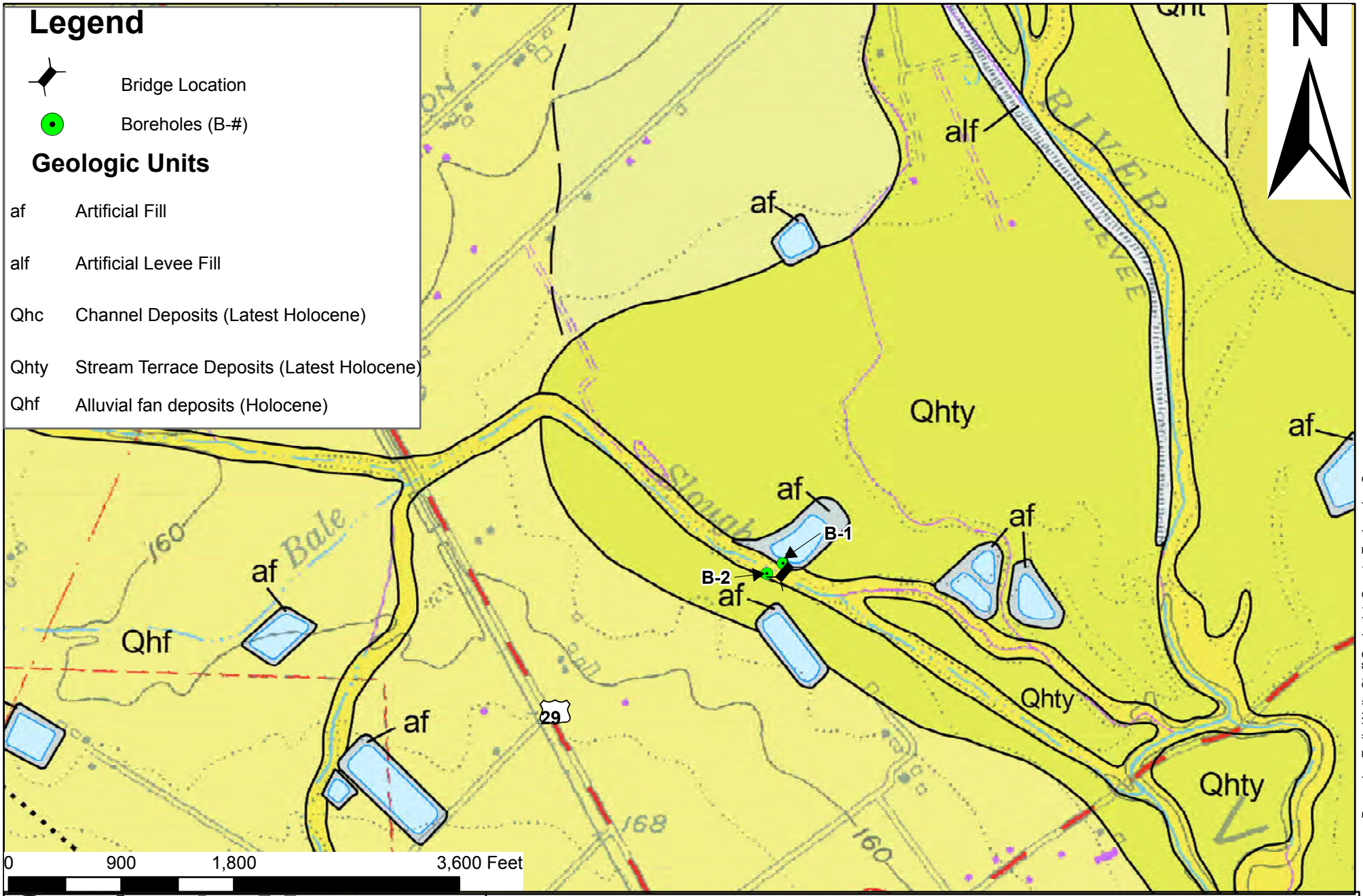
Bale Slough - Bear Creek Restoration Project

Rutherford, California

QUESTA ENGINEERING CORP.

Figure 9

Date: 4/13/2020



California Geological Survey, 2005, Geologic Map of the Rutherford 7.5 Quadrangle, Sonoma and NapaCounties, California: A Digital Database, Version 1.0.

Drawn by: Emily Welk, Staff Geologist, Questa Engineering Corp.

Geologic Map

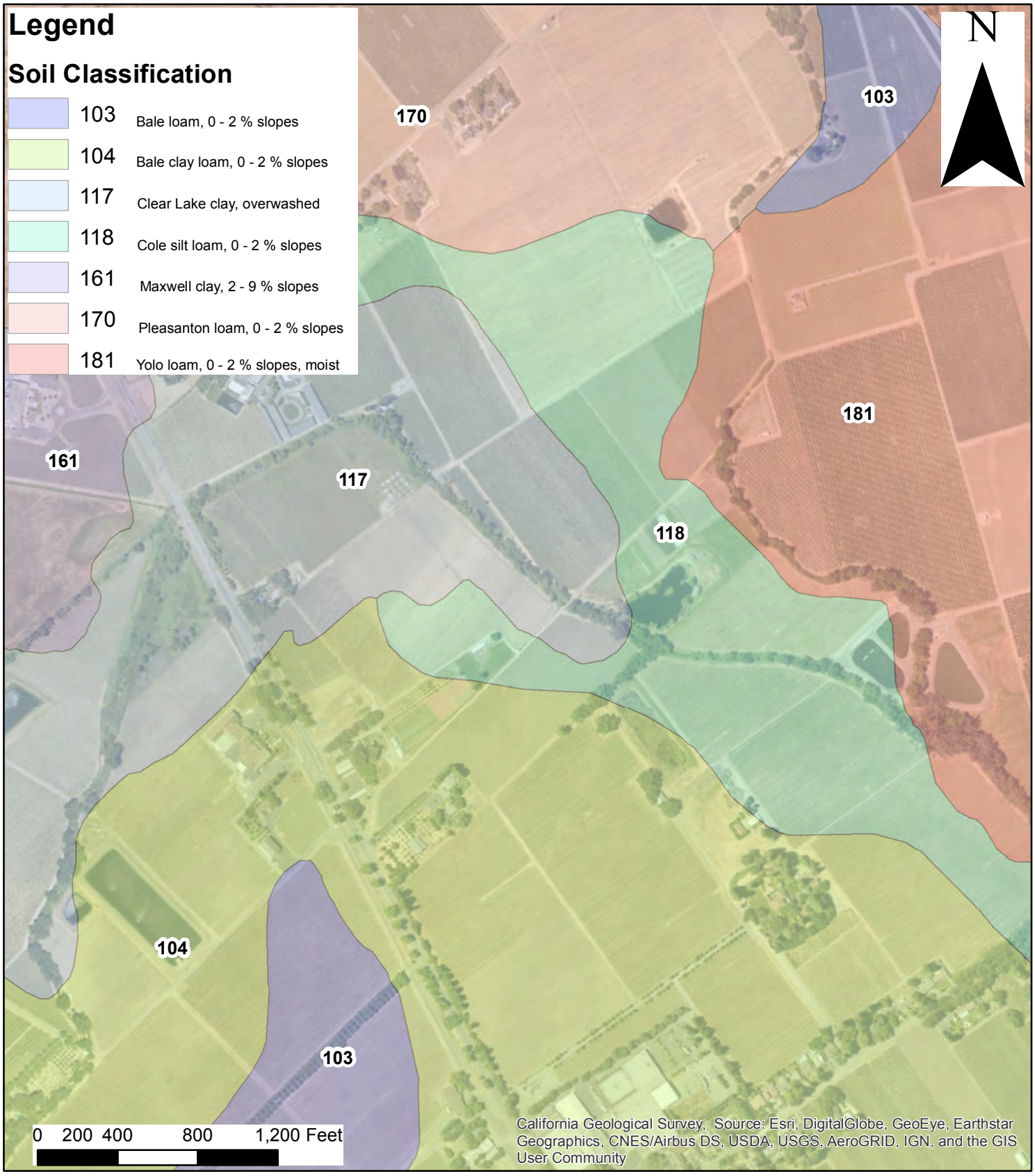
Bale Slough - Bear Creek Restoration Project

Rutherford, Ca

QUESTA ENGINEERING CORP.

Figure 10

Date: 8/4/2020



USDA Soil Map

Bale Slough - Bear Creek Restoration Project

Rutherford, California

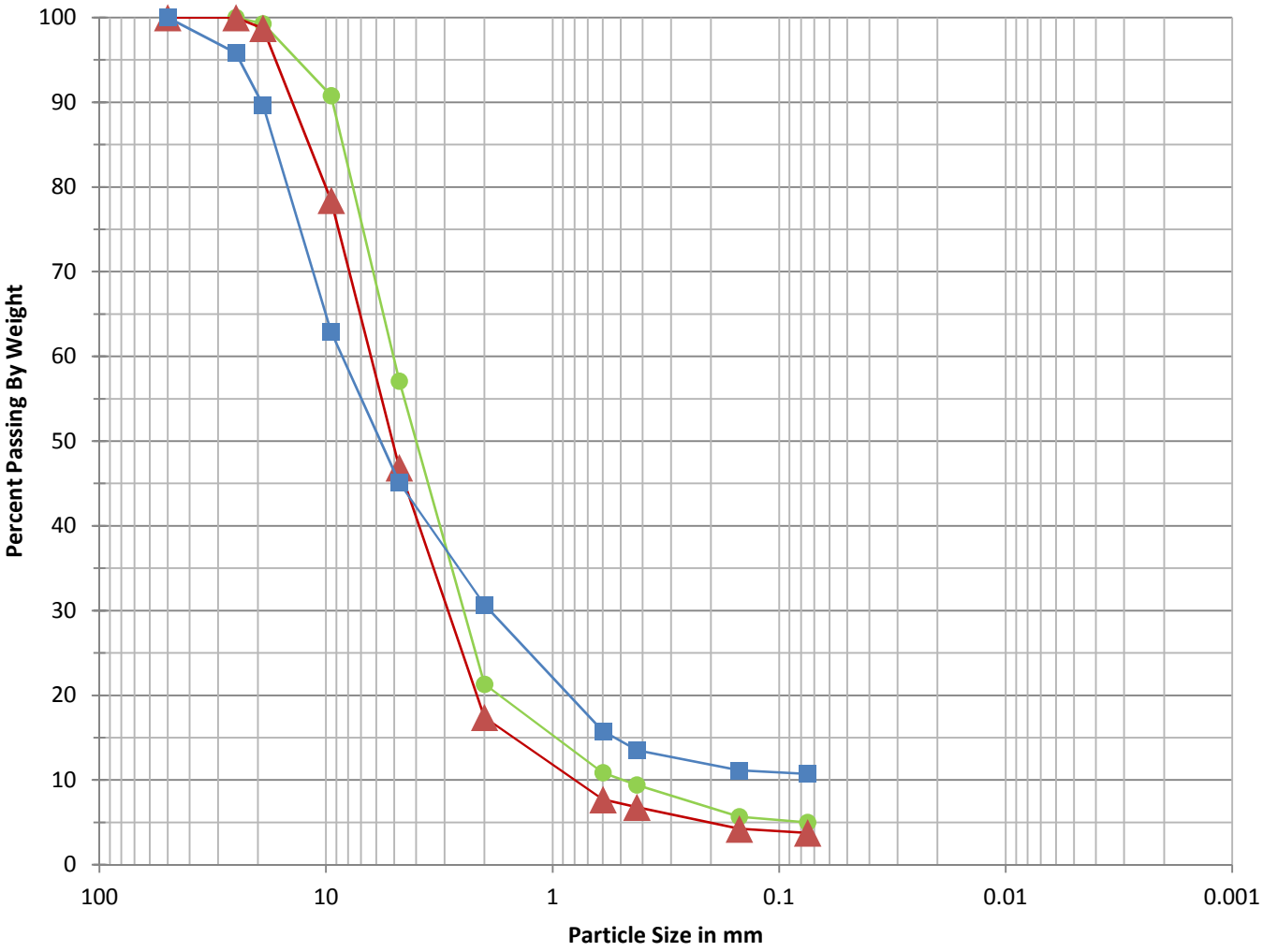
QUESTA ENGINEERING CORP.

Figure 11

Date: 4/7/2020

APPENDIX A

Particle Size Analysis



Gravel		Sand			Silt	Clay
Coarse	Fine	Coarse	Medium	Fine		

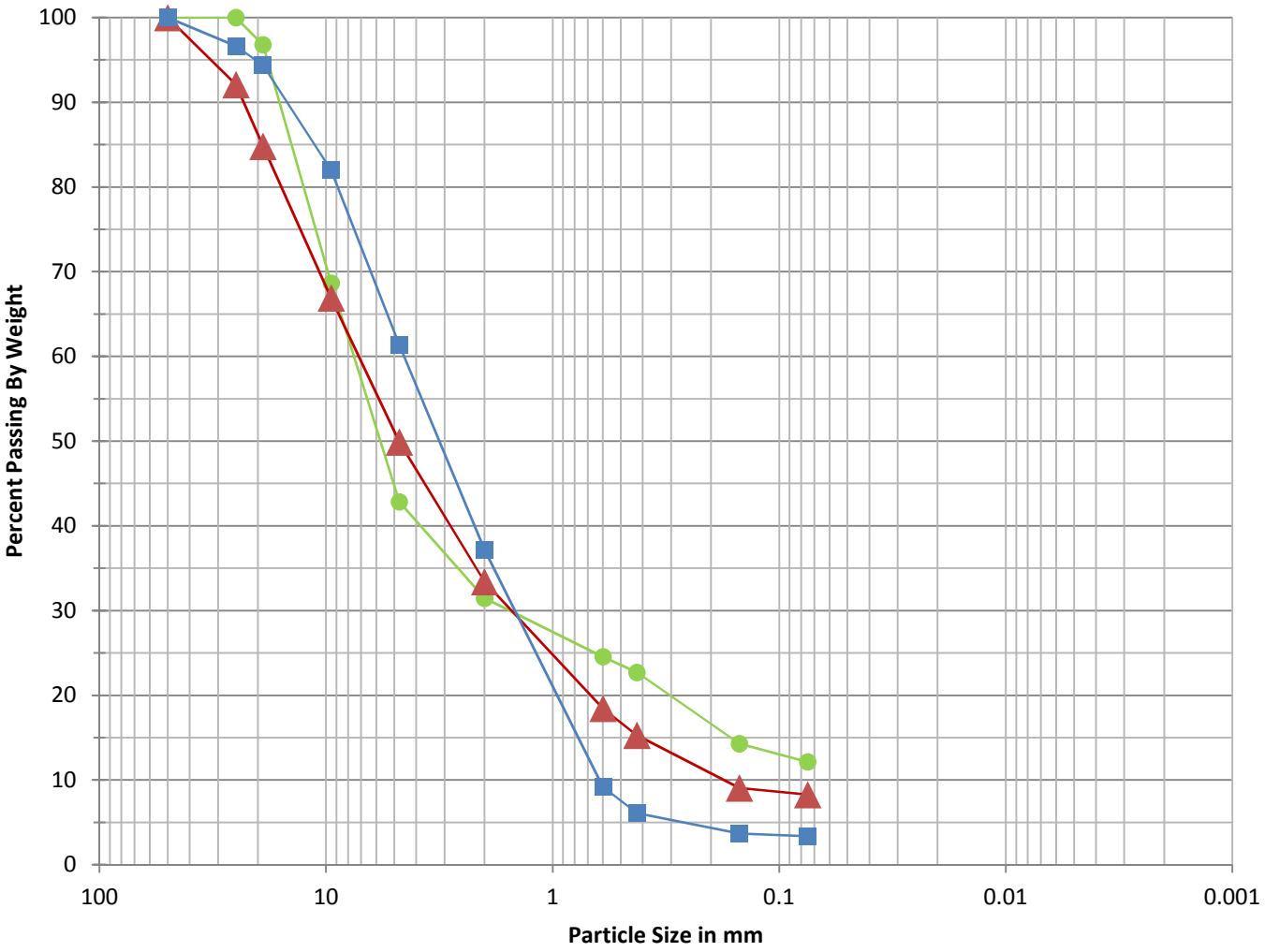
ASTMD6913

Symbol	Source
●	Sample #1
▲	Sample #2
■	Sample #3

QUESTA ENGINEERING CORP
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Particle Size Analysis	Figure
Bale Slough- Bear Creek Rutherford, CA	1

Particle Size Analysis



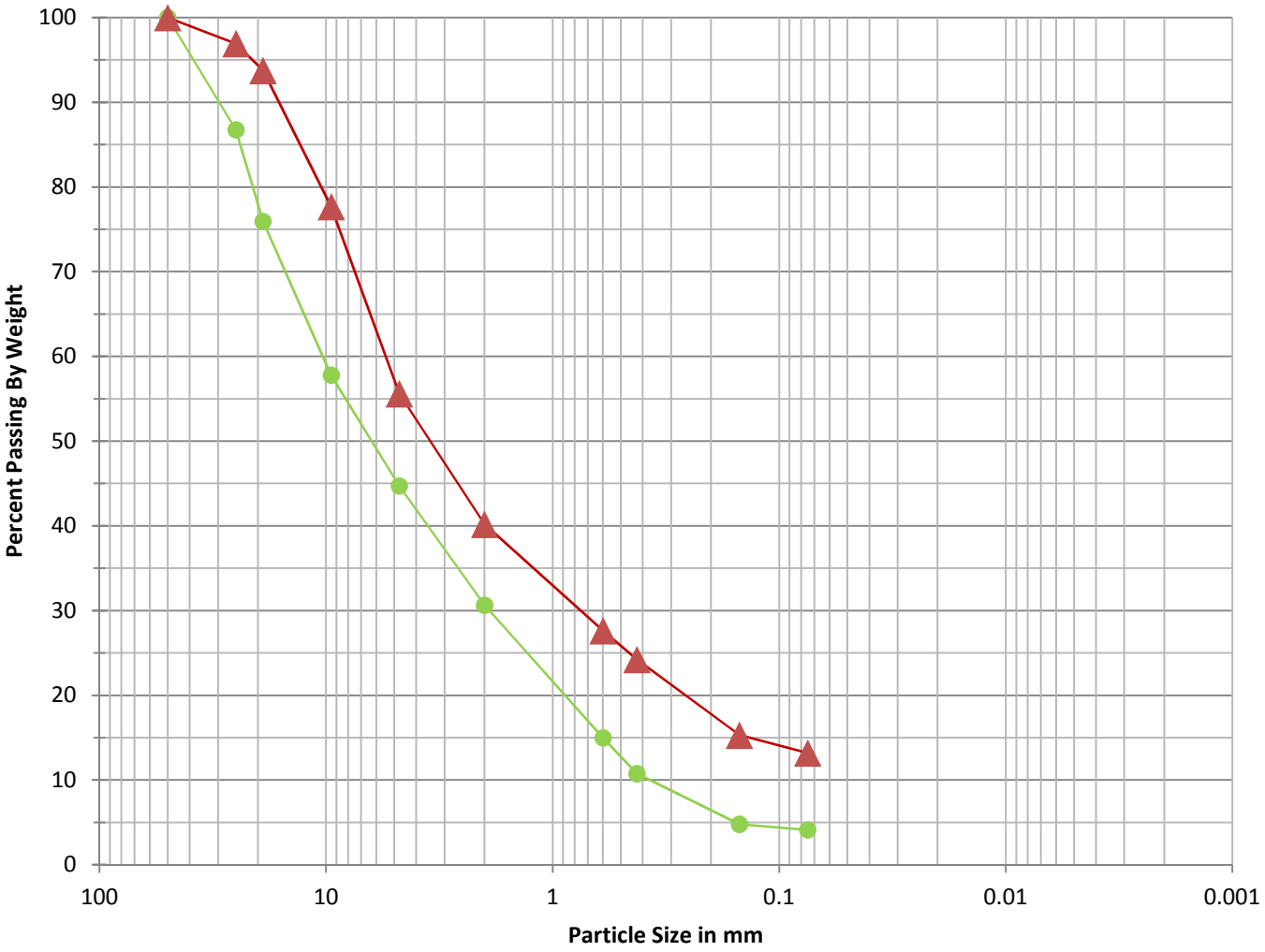
Gravel		Sand			Silt	Clay
Coarse	Fine	Coarse	Medium	Fine		

Symbol	Source
●	Sample #4
▲	Sample #5
■	Sample #6

ASTM D6913

	Particle Size Analysis	Figure
QUESTA ENGINEERING CORP Civil Environmental & Water Resources P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807	Bale Slough-Bear Creek Rutherford, CA	2

Particle Size Analysis



Gravel		Sand			Silt	Clay
Coarse	Fine	Coarse	Medium	Fine		

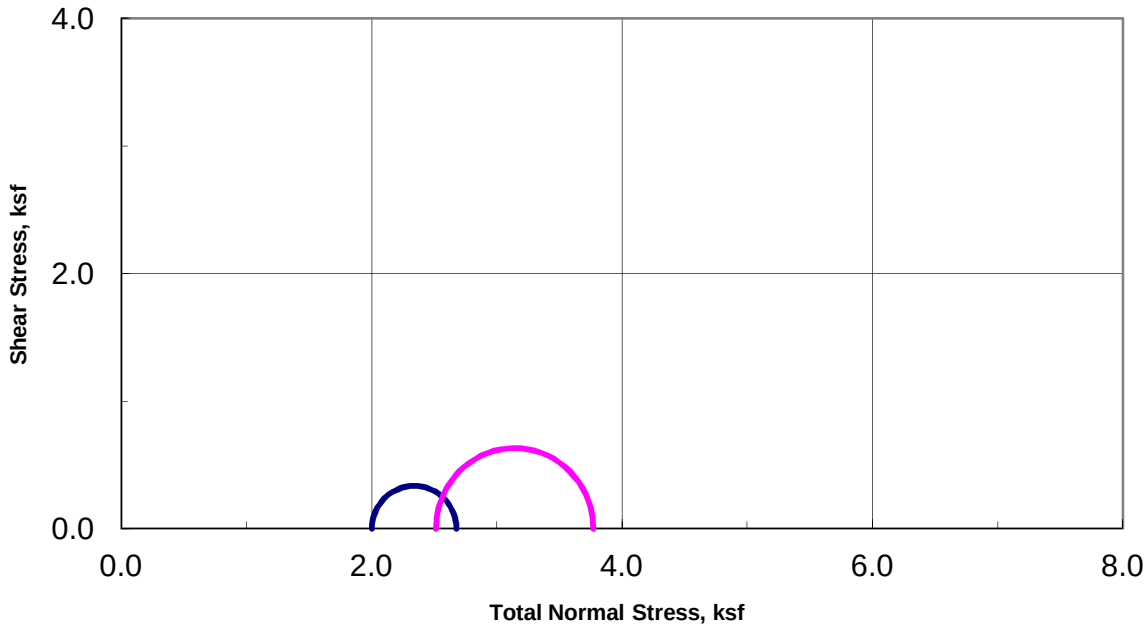
Symbol	Source
●	Sample #7
▲	Sample #9
■	

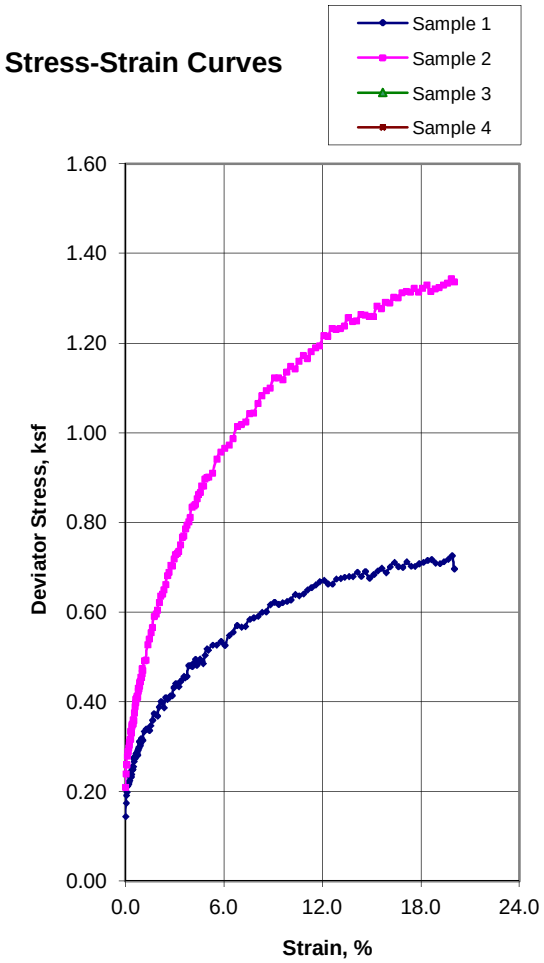
ASTM D6913

	Particle Size Analysis	Figure
QUESTA ENGINEERING CORP Civil Environmental & Water Resources P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807	Bale Slough-Bear Creek Rutherford, CA	3

Cooper Testing Labs, Inc.
937 Commercial Street
Palo Alto, CA 94303

Unconsolidated-Undrained Triaxial Test
ASTM D2850





Sample Data				
	1	2	3	4
Moisture %	44.3	21.5		
Dry Den,pcf	76.3	106.4		
Void Ratio	1.209	0.583		
Saturation %	99.0	99.3		
Height in	5.01	5.00		
Diameter in	2.41	2.42		
Cell psi	13.9	17.4		
Strain %	15.00	15.00		
Deviator, ksf	0.676	1.260		
Rate %/min	1.00	1.00		
in/min	0.050	0.050		
Job No.:	606-039			
Client:	Questa Engineering			
Project:	1900133			
Boring:	B-2	B-2		
Sample:				
Depth ft:	15-15.5	19-19.5		

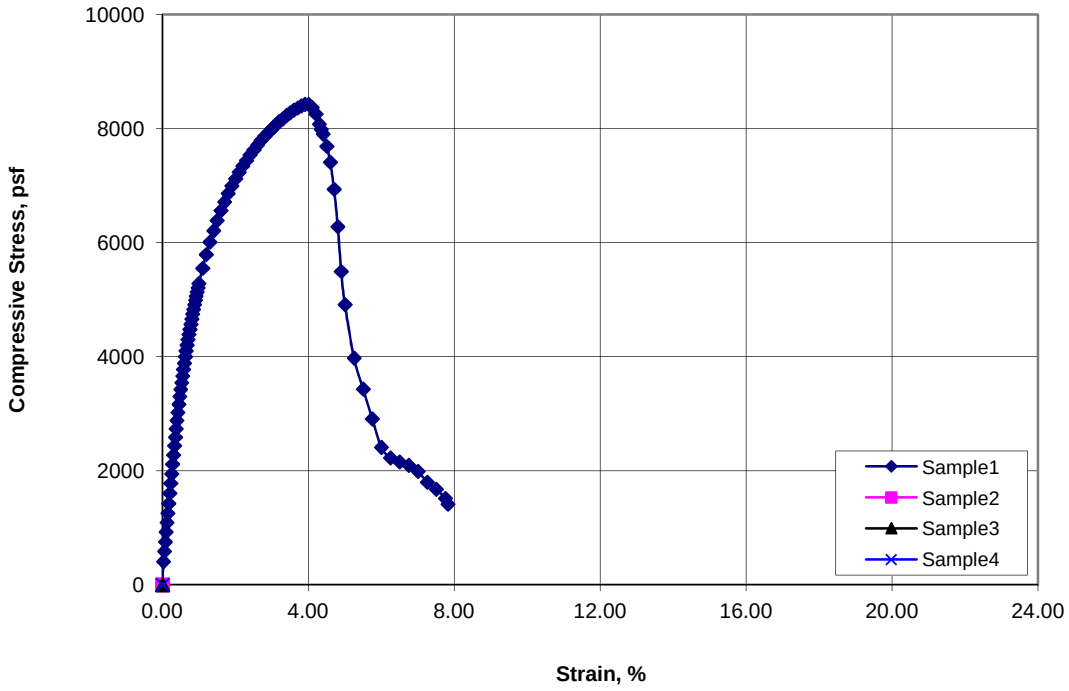
Visual Soil Description	
Sample #	
1	Brown Sandy CLAY
2	Brown Clayey SAND
3	
4	

Remarks:

Note: Strengths are picked at the peak deviator stress or 15% strain which ever occurs first per ASTM D2850.

Unconfined Compressive Strength

ASTM D2166



Sample No.:	1	2	3	4	
Unconfined Compressive Strength, psf	8428				
Unconfined Compressive Strength, psi	58.5				
Undrained Shear Strength, psf	4214				
Failure Strain, %	4.0				
Strain Rate, % per minute	1.0				
Strain Rate, inches/minute	0.05				
Moisture Content, %	23.5				
Dry Density, pcf	99.6				
Saturation, %	91.6				
Void Ratio	0.692				
Specimen Diameter, inches	2.395				
Specimen Height, inches	5.01				
Height to Diameter Ratio	2.1				
Assumed Specific Gravity	2.70				

Sample Location				
	Boring	Sample	Depth, ft.	Soil Description
1	B-1		6-6.5	Black CLAY
2				
3				
4				

Job No.:	606-039	Type of Sample	Undisturbed
Client:	Questa Engineering		
Project:	1900133		
Date:	6/25/2020 By: MD/RU		

Remarks:

COOPER TESTING LABORATORY

Corrosivity Tests Summary

CTL # 606-039 **Date:** 7/1/2020 **Tested By:** JC **Checked:** PJ

Client: Questa Engineering **Project:** Napa/Bear Creek **Proj. No:** 1900133

Remarks:

Sample Location or ID			Resistivity @ 15.5 °C (Ohm-cm)			Chloride	Sulfate		pH	ORP (Redox)		Sulfide	Moisture	Soil Visual Description
			As Rec.	Min	Sat.	mg/kg	mg/kg	%				Qualitative	At Test	
						Dry Wt.	Dry Wt.	Dry Wt.		E_H (mv)	At Test	by Lead	%	
Boring	Sample, No.	Depth, ft.	ASTM G57	Cal 643	ASTM G57	ASTM D4327	ASTM D4327	ASTM D4327	ASTM G51	ASTM G200	Temp °C	Acetate Paper	ASTM D2216	
B-1	-	3-3.5	2,581	-	-	5	102	0.0102	6.5	-	-	-	18.3	Very Dark Grayish Brown Sandy CLAY
B-2	-	2.5-4	2,106	-	-	10	125	0.0125	7.2	-	-	-	21.6	Very Dark Grayish Brown Sandy CLAY

Appendix F

Draft Mitigation Monitoring Program

BALE SLOUGH - BEAR CREEK TRIBUTARY RESTORATION PROJECT
MONITORING AND MAINTENANCE PLAN



Proposed Restoration Area: Group C, Site 12 Bale Slough - Bear Creek

Napa County Flood Control and Water Conservation District
804 First Street
Napa, California, 94559
Contact: Jeremy Sarrow
(707) 259-8204

Napa County Resource Conservation District
1303 Jefferson Street, Suite 500 B
Napa, California, 94558
(707) 252-4188

Table of Contents

1. Introduction **3**

2. Background **3**

3. Project Goals **4**

4. Monitoring and Maintenance Approach **4**

4.1 Monitoring and Maintenance Reaches/Areas **5**

5.0 Monitoring Methods **7**

5.1 Cross Section Surveys **7**

5.2 Longitudinal Profile Surveys **8**

5.3 Annual Maintenance and LWD Surveys **8**

5.4 Vegetation Establishment Surveys **9**

5.5 Photo Monitoring **10**

6.0 Data Management and Reporting **11**

7.0 References **12**

1. Introduction

The purpose of this document is to present a monitoring and maintenance plan (Plan) for the Bale Slough - Bear Creek Tributary Restoration Project (Project) designed to measure the response and evaluate the effectiveness of restoration actions related to implementation of the proposed Project. Implantation of the Project is dependent on grant funding and is anticipated to being in 2021 or 2022. This document defines the monitoring protocols and frequency of monitoring and maintenance surveys that will be used to evaluate and report on the Projects effectiveness. Monitoring team members include Napa County Flood Control and Water Conservation District (District) and Napa County Resource Conservation (RCD) staff. A digital copy of this monitoring plan and associated annual reports will be posted to the District's website (https://www.countyofnapa.org/1074/Flood-Water-Resources) for download and viewing should the Project be implemented.

2. Background

The Bale Slough - Bear Creek Tributary Restoration Project is a landowner initiated Project implemented along a 1.3-mile reach of tributary creek to the Napa River; **Figure 1.** Changes in land use and management in the Napa River watershed have resulted in confinement of stream channels, loss of riparian and wetland habitat, accelerated channel incision and bank erosion, and ongoing channel degradation and property loss. A suite of restoration approaches are proposed to achieve restoration goals and objectives, including: setting back earthen berms from the top of the river bank; creating vegetated buffers between the stream and adjacent land uses; creating backwater habitat to provide high-flow refugia for native fish; installing instream structures to improve aquatic habitat; removing non-native invasive and Pierce's disease host plants; planting native understory species; and installing biotechnical bank stabilization to stabilize actively eroding banks

The purpose of the Project is to restore and enhance long-term stream and floodplain function, increase instream flow, improve the quality and resilience of aquatic and terrestrial riparian habitat, reduce property damage and fine sediment delivery associated bank erosion and provide a means of compliance with the sediment Total Maximum Daily Load (TMDL) for the Napa River watershed. Restoration elements and features of the Project included widening the river channel, reducing channel bank erosion, improving the quality and resilience of aquatic and terrestrial habitat, and enhance overall channel and floodplain function along the Project reach.

The Project will also include an annual maintenance program funded by landowner assessments which addresses bank erosion, debris removal, downed tree stabilization/relocation, invasive and Pierce's Disease host plant management and repair (as needed) of instream habitat structures and features. The Project has strong landowner participation and will include the formation of a landowner advisory committee (LAC) established to guide adaptive management needs within the respective Project areas. Additional detailed descriptions for the Project are currently being developed and will be presented in the Initial Study/Mitigated Negative Declaration (IS/MND) being prepared as a requirement for review under the California Environmental Quality Act (CEQA).

3. Project Goals

The goals and objectives for the Project continue to be those as originally outlined in planning and regulatory documents and are restated below:

- Minimize the need for ongoing channel stabilization and repair work by establishing a more self-sustaining channel design which reduces maintenance needs;
- Enhance geomorphic channel forms and processes to support a more diverse and complex instream condition;
- Increase floodplain interactions where possible;
- Increase and enhancing riverine, riparian, and floodplain habitat functions, with a focus to improve habitat for fish and wildlife;
- Removal and management of invasive nonnative vegetation and replanting with native vegetation that will not promote Pierce's disease in vineyards;
- Support the sediment reduction and habitat enhancement goals of the Napa River Sediment Total Maximum Daily Load (TMDL); and

4. Monitoring and Maintenance Approach

The monitoring and maintenance approach links Project goals to monitoring elements based on the understanding of process-based relationships between existing conditions and restoration actions aimed at achieving desired outcomes. Performance indicators have been developed for the Project goals where by success can be evaluated by quantifying progress towards meeting these standards over the life of the Project. Monitoring will ultimate determine and drive adaptive maintenance needs of the Project. Monitoring and maintenance methods, frequency of surveys and desired outcomes and performance and maintenance standards are described below in detail and may be modified by the Project team periodically on an as-needed basis in consultation with regulatory partners in order to better measure indicators and adaptive manage Project Sites.

The Plan has several components, including:

1. An annual survey of the entire Project reach to observe current conditions and identify if any immediate adaptive management actions are needed;
2. Detailed channel transect, longitudinal profile and Large Woody Debris (LWD) surveys designed to characterize the long term geomorphic response to changing channel conditions and quantify and qualify associated instream aquatic habitat based on flow variation and vegetation establishment;
3. Phased vegetation establishment surveys to track plant establishment and guide adaptive management of re-vegetated areas; and
4. Photo-monitoring at defined stations to capture changes over time.

A Before/After Control/Impact (BACI) approach is being applied to assess status and trends of physical and biological responses to restoration actions (Gerstein & Harris, 2005). Monitoring methods have also been chosen to balance the frequency and resolution of data collection in as meaningful and yet cost-

effective manner as possible while ultimately evaluating the success of each restoration site within the Project reach.

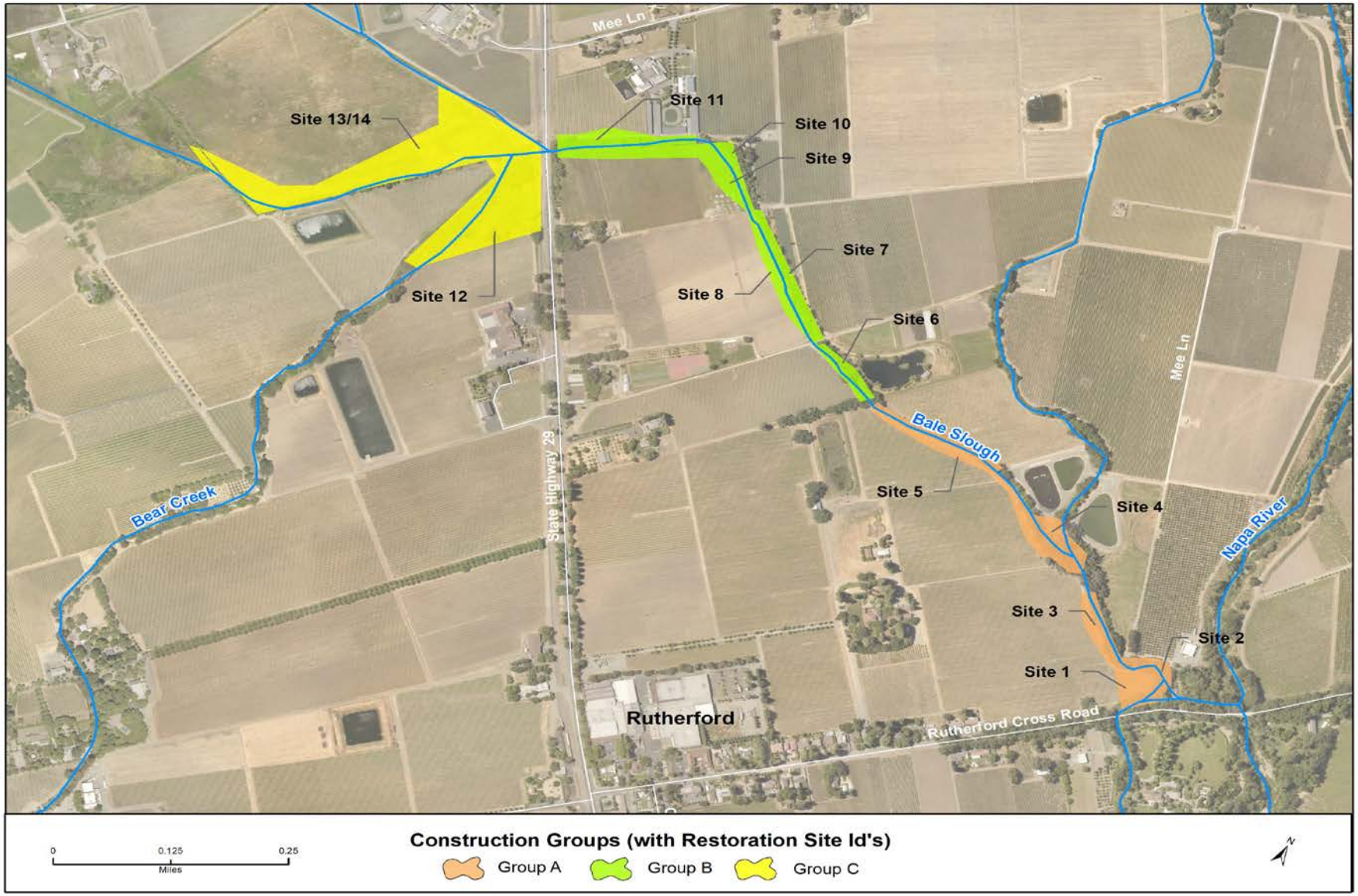
Monitoring and maintenance surveys will be conducted annually through the 20-year "life" of the Project. The District will re-evaluate the monitoring and maintenance plan every five years to determine if any changes should be made to the methods or frequency of the monitoring and maintenance surveys.

4.1 Monitoring and Maintenance Reaches/Areas

Monitoring and maintenance takes place within the 3 monitoring "reaches" (Groups A-C), which are labeled in a downstream to upstream direction and further divided into distinct restoration Sites (1-14); **Figure 1**. Results from monitoring and maintenance surveys reference these Groups and specific restoration Sites.

Specific locations and required monitoring sites within the Project area have been selected based on the specific survey type (i.e. cross sections, pebble counts, etc.) requirements. Survey monuments and other pertinent information are recorded using hand-held global position system (GPS) units and uploaded into project specific Geographical Information System (GIS) databases.

Figure 2: Monitoing Groups and Site within Project Area



5.0 Monitoring Methods

Monitoring methods are designed to provide data on the structural and physical characteristics of each restoration Site over the life of the Project. Monitoring periods for the below surveys will vary annually depending on the type of survey and available monitoring budget. **Table 5-1** provides a general outline of the frequency of monitoring and maintenance surveys.

5.1 Cross Section Surveys

Topographic cross section surveying of the stream channel is a standard method to evaluate physical changes (e.g., widening, erosion, or aggradation/deposition) in channel geometry. Additionally, when annotated, cross sections can be utilized to measure changes in the extent of riparian and aquatic habitat. Therefore, the objective of the cross section surveys is to record changes in channel morphology and relate these changes to overall riparian habitat through measuring riparian vegetation buffer width and general riparian vegetation community distribution. District staff will coordinate cross section surveys in cooperation with team partners, including the RCD, their resource specialists, and landowner representatives.

Methods

Baseline and as-built condition monitoring and control cross sections for the Project will be established before and after construction in order to document pre and post-construction changes. In the field, each cross section will have a physical monument consisting of a rebar pin (one at each side of top of bank as well as one at each side of the base of bank) for monumenting purposes and will also be tagged and labeled by river stationing and GPS waypoint. In addition to elevation data collected, vegetation cover (dominate species), sediment and substrate data (grain size) and photo documentation will also be collected at each transect.

The following parameters will be evaluated from comparing pre- and post- construction, and five year recurrent surveys:

- Channel Adjustment: Lateral Migration and Deposition or Scour
- Bank full Width to Depth Ratio: Entrenchment
- Vegetation Communities and Riparian Buffer Width
- Riffle and Pool Habitat Location Changes
- Substrate class distribution (pebble counts) – fines, sands, gravel, cobble, boulder, bedrock, median grain size (D50) at each cross section

Frequency

Cross section surveys for the entire Project reach will be established before and after construction and re-occupied at 5 year intervals thereafter.

Performance Standards

The performance standards that apply to cross section monitoring include the following:

- Positive trends in increases in bank full channel width to depth ratios which would indicate that the channel is becoming less confined.

- Positive increase for in-channel gravel recruitment and fine sediment storage which would indicate improved instream habitat and decreased fine sediment transport (in support of the TMDL objectives).
- Positive trends and increases in riparian vegetation buffer width which would indicate an overall improvement in riparian habitat.

5.2 Longitudinal Profile Surveys

Longitudinal profile surveys provide detailed topographic data depicting channel slope, elevation, and aquatic habitat features (riffles, pools, etc.). A baseline pre- and post-construction longitudinal thalweg survey will be established before and after construction activities in order to document changes in channel conditions.

Methods

Channel surface elevations will be surveyed along the thalweg and points will be recorded at all riffle crests, pool bottoms, and significant transitions in bed substrate composition (boulder, cobble, gravel, sand, silt, bedrock). Spacing between intermediate points will generally be no more than 10 feet. Surveys will be conducted with a total station, transit, RTK-GPS, or hand level in vicinity of cross sections located in expected response reaches, as well as in control reaches. The following parameters will be evaluated from comparing pre- and post- construction and five year recurrent surveys:

- Vertical Channel Adjustment: Deposition or Aggradation, which would indicate if the channel is establishing a more stable channel geometry.
- Frequency and Extent of Habitat Units: Channel Complexity, Riffle Habitat Length, Pool Depth, which would indicate improved instream habitat.

Frequency

As mentioned above, the baseline thalweg and post construction surveys will be completed before and after construction activities and re-occupied at 5 year intervals thereafter.

Performance Standards

The performance standards that apply to thalweg surveys include the following:

- Positive trends in formation of larger riffles and deeper pool

5.3 Annual Maintenance and LWD Surveys

An annual maintenance survey allows for regular assessment of the Project reach. By conducting an annual maintenance survey District staff is able to make informed adaptive management decisions. The survey guides annual maintenance activities at each restoration Site and throughout the entire Project reach. Additionally, every five years a comprehensive survey of all naturally recruited (minimum length 6’ or greater, diameter 18” or greater) and installed large woody debris structures (LWD) will be conducted as part of the maintenance survey in order to evaluate habitat function and persistence over the life of the Project.

Methods

District staff, in coordination with the LAC, will conduct maintenance surveys annually and on an as need basis shortly after large storm events to identify areas that may require immediate treatment such as streambank erosion that threatens existing infrastructure, restoration elements and environmental resources. Annual surveys will be conducted in the summer during low flow periods.
For each naturally recruited and installed occurrence of LWD encountered, field crews will record whether each feature is serving any of the following functions: spawning gravel recruitment, hydraulic constriction, pool scour, summer refugia, winter high-flow refugia, or bank stabilization. GPS units enabled with data field forms developed by the District will be used to record maintenance and monitoring observations, and to identify recommended treatments or adaptive management strategies.

The annual maintenance survey will be conducted to collect data and make observations to support the following:

- Identify and prioritize invasive and Pierce host plants vegetation management needs
- Document and prioritize debris jams that may require realignment and/or relocation
- Identify trash and debris within the active channel for removal
- Evaluate function, persistence and status of installed instream habitat structures for any necessary maintenance
- Record naturally recruited LWD structures in order to evaluate habitat function
- Document active eroding stream banks and prioritize any remediation actions if necessary

Frequency

Annual maintenance surveys will be conducted for the entire Project following the completion of construction of a particular restoration Site. Additional surveys may be required after large storm events and will occur on an as needed basis. Comprehensive naturally recruited and installed LWD habitat function surveys will be conducted every five years in conjunction with the maintenance survey.

Performance Standards

The performance standards that apply to annual maintenance surveys include the following:

- A decrease in invasive and Pierce host plants within the Project area which indicate effective control of non-natives and expansion of native riparian plant communities.
- A reduction in trash and debris identified annually within the active channel which indicate improvements in water quality.
- Increase in pool scour and persistence of installed instream habitat structures which indicate improvements in instream habitat.
- A reduction in length and width of active eroding stream banks which indicate the channel is establishing a more stable geometry.

5.4 Vegetation Establishment Surveys

Vegetation planted at each restoration Site will be monitored to track plant establishment, comply with permit conditions and to guide adaptive management strategies. Annual vegetation surveys allow for an assessment of plant establishment that inform and guide maintenance actions to ensure that the Project is able to meet the revegetation performance standards.

Methods

Annual direct count of installed plants in revegetation areas will be conducted to determine the percent survivorship and to qualitatively assess health and vigor of the planting. This involves a direct count and assessment of each installed plant to determine whether it is dead or alive as well as the general vigor and health of the plant (Harris et al., 2005). The surveys will include establishing transect lines for a given restoration Site and categorizing the cover class and percentage of cover along the intercept line (i.e. herbaceous, woody, bare ground, native vs. non-native, etc.) and photographing each surveyed transect line. Transect lines are perpendicular to the channel in order to capture specific performance of planted species at a given river bank elevation or planting zone ad are monumented with rebar pins at the top and base of the stream bank.

Vegetation establishment surveys are conducted to support the following:

- Document plant establishment and natural recruitment
- Assess percent vegetative cover and survivorship
- Document percent native vs. non-native vegetative cover

Frequency

Vegetation installed in restoration areas will be monitored for the first three establishment years by the contractor that installed the plants at a respective restoration Site. Thereafter, vegetation monitoring and management in restored areas will be done by the District. Following the three year vegetation establishment period, surveys will take place at years 5 and 10 following the initial planting date of each respective area.

Performance Standards

The target performance standards and success criteria for vegetation establishment include the following:

- A minimum of 80% of native plants installed shall survive/establish at the re-vegetation sites within 3 years after being installed and a years 5 and 10 post installation
- 70% or greater native cover will exist at any given planting site over the *life* of the Project

5.5 Photo Monitoring

Photo monitoring will be conducted at all restoration Sites in order to documentation pre- and post-construction conditions and change over time. Photo monitoring stations will be established and re-occupied to provide a visual record of change in channel conditions and vegetation establishment.

Methods

Photo monitoring will be conducted to capture visual change and make observations to support the following:

- Document the function and success of restoration elements

Frequency

Photo monitoring activities will be carried out by the District multiple times a year at each restoration Site. The District will re-occupy photo monitoring points during winter high flow conditions and spring low flow conditions in order to capture and document changes and function of restoration elements and establishment and development of riparian vegetation.

Performance Standards

The performance standards for photo monitoring include the following:

- Evidence vegetation establishment and natural recruitment which indicates expansion of native riparian corridor,
- Visual evidence of persistence of restoration elements which indicate improvements to instream habitats,
- Evidence of increased channel complexity which indicate enhanced geomorphic channel forms and processes and improvements to instream habitats,

Table 1 below outlines the frequency in which a given monitoring survey is conducted.

Table 1. Overview of Monitoring Surveys and Frequency

Monitoring Survey	Pre-construction	Post-construction	Annually	5 year intervals following construction
Cross Section	–	–		–
Thalweg Surveys (Longitudinal Profile)	–	–		–
Large Woody Debris Survey	–	–		–
Annual Maintenance Survey			–	
Vegetation Establishment Survey		–		–
Photo Monitoring	–	–	–	

6.0 Data Management and Reporting

The District will function as the primary data management and reporting entity for the Project. The District will coordinate with landowners to gain access to the restoration Sites, schedule survey activities, oversee the development of annual reports, and circulate reports to resource agencies and landowners.

Data Management

The District will function as the organizational sponsor for archiving of digital and physical copies of all field data sheets, photo documentation, GIS layers, and reports associated with the Project. Final reports will also be posted to the District's website (https://www.countyofnapa.org/1074/Flood-Water-Resources) for download and viewing.

Reporting

The District and RCD will collaborate on the development of the annual monitoring and maintenance report. The Report will present the findings of the maintenance survey and adaptive maintenance activities implemented by July of each year as well as the result and analysis of all monitoring activities performed the previous calendar year. An outline of the report is as follows:

- Overview of annual maintenance surveys
- Description of work completed
- Table outlining maintenance and monitoring costs
- Discussion of existing conditions and observed changes
- Summary of annual monitoring activities
- Discussion of monitoring data collected
- Overview of monitoring results
- Review of previous monitoring findings, trends and changes observed

7.0 References

Flosi, G., S. Downie, J. Hopelain, M. Bird, R. Coey, and B. Collins / CDFG (1998)

California Salmonid Stream Habitat Restoration Manual, Third Edition. Sacramento, California, California Department of Fish and Game, Inland Fisheries Division.
http://www.dfg.ca.gov/nafwb/pubs/1998/manual3.pdf

Gerstein, J.M. (2005)

Monitoring the Effectiveness of Instream Habitat Restoration. University of California, Center for Forestry, Berkeley, California. 45 pgs.
http://forestry.berkeley.edu/comp_proj/DFG/Monitoring%20the%20Effectiveness%20of%20Instream%20Habitat%20Restoration.pdf

Gerstein, J.M. and R.R. Harris. (2005)

Protocol for Monitoring the Effectiveness of Bank Stabilization Restoration. University of California, Center for Forestry, Berkeley, CA. 24 pgs.
http://www.cnr.berkeley.edu/forestry/comp_proj/DFG/Monitoring%20the%20Effectiveness%20of%20Bank%20Stabilization%20Restorati.pdf

Gerstein, J.M., S.D. Kocher and W. Stockard. (2005)

Documenting Salmonid Habitat Restoration Project Locations. University of California, Center for Forestry, Berkeley, CA. 22 pgs.

http://www.cnr.berkeley.edu/forestry/comp_proj/DFG/Documenting%20Salmonid%20Habitat%20Restoration%20March%202005.pdf

Harris, R.R., S.D. Kocher, J.M. Gerstein and C. Olson. (2005)

Monitoring the Effectiveness of Riparian Vegetation Restoration. University of California, Center for Forestry, Berkeley, CA. 33 pp.
http://www.cnr.berkeley.edu/forestry/comp_proj/DFG/Monitoring%20the%20Effectiveness%20of%20Riparian%20Vegetation%20Restorat.pdf